Mental health and wellbeing of ethnic migrant women and girls in Aotearoa New Zealand: a scoping review

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ABSTRACT

AIM: To identify and synthesise the literature on mental health and wellbeing of Asian and MELAA (Middle Eastern, Latin American and African) women and girls in Aotearoa New Zealand (New Zealand).

METHODS: We searched American Psychological Association (APA) PsycInfo, CINAHL, Embase (Ovid) and MEDLINE (Ovid) for studies published in English up to July 2023 investigating the mental health and wellbeing of Asian and MELAA women and girls living in New Zealand. Studies including other participants were eligible if they provided disaggregated data for Asian and MELAA women/girls in New Zealand. We extracted data on study characteristics and all relevant findings related to their mental wellbeing.

RESULTS: Twenty-four studies provided data on approximately 15,000 Asian and MELAA women and girls aged over 12 years. The studies had heterogeneous population groups and outcomes. Three exclusively focussed on Asian women. Most studies (n=17) did not provide disaggregated data for Asian and MELAA women and girls in relation to all relevant outcomes reported. Investigated outcomes included prevalence data and symptoms of mental health conditions and mental wellbeing (n=18) and associations of socio-demographic factors with mental health (n=9).

CONCLUSION: The limited peer-reviewed data underpin the lack of evidence-based policy planning. Future research focussed on Asian and MELAA women and girls is needed to enhance their wellbeing and achieve equitable health outcomes.

Women constitute nearly half of global migrants.[1] They migrate for different reasons. While some pursue more equal development possibilities in wealthier countries, which increasingly demand care work,[2] others accompany their husbands or partners, becoming "trailing spouses".[3] As economic migrants, these women often take up specifically gendered roles in the global labour market, e.g., care work, nursing or factory work.[3] Some women may migrate to escape restrictive gender norms.[4] Those with refugee backgrounds or asylum seekers may have dealt with physical and sexual violence, loss of family members and persecution—which are risk factors for poor mental health and have major implications for access to care.[5,6] Irrespective of the reason, migration is a stressful process that poses a significant risk to the mental health and wellbeing of migrant women.[5]

Women's migration experiences are frequently shaped by the intersection of gendered inequalities (such as access to nutrition, education, income and safety) and migration-related social inequalities (such as legal dependency on spouses, greater involvement in caregiving roles, lack of employment in the new country).[7] Unlike their male counterparts, women are more likely to experience intersectional discrimination of both racism (from the host society) and sexism (including from their own communities), which creates distinct social and health inequities.[5] For example, families and male partners may demand gender roles and attitudes from women, which may conflict with how most women live their lives in their new country.[5] Migration has also been consistently identified as a significant risk factor for family violence in minority communities.[8]

Since the 1986 immigration reforms in Aotearoa New Zealand (New Zealand), there has been a significant increase in migration from Asian, and Middle Eastern, Latin American and African (MELAA) countries. These population groups are some of the fastest growing in New Zealand, constituting 19.2% of the total population.[9] Of these, at least half are women.[9] The Asian and MELAA groups, usually being presented as distinct population groups, have high heterogeneity regarding country of origin, visa status (e.g., temporary workers, international students, refugees etc.), time of residence in New Zealand and degree

of integration into the New Zealand society. Furthermore, this group also presents varied social markers (e.g., age, religion, sexuality, socio-economic status) and settlement patterns (rural versus urban centres).[10]

In 2018, less than a quarter of the Asian and MELAA populations was born in New Zealand, indicating a high proportion of them are first-generation migrants who have been living in New Zealand for varied periods.[10] The limited evidence that exists highlights that Asian and MELAA communities experience several health inequities in New Zealand, including high rates of cardiovascular diseases,[11,12] diabetes,[13] low birth weight,[11] mental health issues[14] and high risk of stroke.[11] At the same time, these communities show lower access rates to health services and healthcare utilisation, including primary care enrolment, screening services, mental health services, disability support and aged residential care.[15]

A recent review identified significant structural barriers, i.e., policies and frameworks that create inequitable access to healthcare services.[16] These included cost of healthcare, limited access and quality of interpreter services (language barriers), short-duration appointments with long waiting times, difficulty navigating the health system and logistical barriers such as lack of knowledge on how to access health services. Language and cultural differences between service users and service providers have also been shown to reduce access to specialised services, such as mental health.[17]

The Asian and MELAA populations in New Zealand are projected to constitute over 25% of the total population by 2043.[18] Understanding the mental health needs of Asian and MELAA women and girls and providing culturally and gender-responsive services can no longer be overlooked. The first step involves revealing what is currently known. Thus, we conducted a scoping review to identify and synthesise the existing literature relating to mental health and wellbeing of Asian and MELAA women and girls in New Zealand (both New Zealand born and migrants). The ultimate objective was to describe evidence gaps that need to be addressed to improve mental health outcomes for this population.

Methods

This review focussed on research on the mental health of Asian and MELAA women and girls living in New Zealand (both New Zealand–born and migrants). Research articles published up to July 2023, in English, that used quantitative, qualitative or mixed methods to measure or focus on specific dimensions of mental health of women/girls in New Zealand who self-identify as Asian and MELAA (irrespective of age or sex assigned at birth) were included. Studies with additional types of participants were included only if disaggregated data for Asian and MELAA women/girls were provided. Studies with data from different countries, including New Zealand, on the mental health of migrants, ethnic groups or women, were included only if disaggregated data for Asian and MELAA women/girls in New Zealand were provided.

Based on the eligibility criteria and medical subject headings related to mental health conditions described in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5-TR), separate search strategies were created for four databases: American Psychological Association (APA) PsycInfo, CINAHL, Embase (Ovid) and MEDLINE (Ovid) (see Appendix). Following the search, all identified citations were collated and uploaded into EndNote 21 (Clarivate Analytics, PA, USA), and duplicates were removed. One reviewer (JVDA) screened titles and abstracts and assessed them against the inclusion criteria, consulting the wider research group for clarifications. Potentially relevant sources were retrieved in full for detailed assessment against the inclusion criteria. Reference lists of included studies were screened for additional sources of evidence. Grey literature (e.g., reports, policy literature, working papers, government documents) was not included.

Data were extracted (by JVDA) using a data extraction table developed for this review to document general information about each study (e.g., study design, participant characteristics, methods) and findings related to the review question, i.e., mental health and wellbeing of Asian and MELAA women and girls. These included data on the prevalence or incidence of a broad range of mental health conditions and psychological factors that could influence mental health and wellbeing (e.g., quality of life, life satisfaction, sense of connectedness and sense of belonging). No contact was made with the authors of the included study for any additional data.

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines[19] to report the study findings, which include the study characteristics, mental health outcome measures and the outcome data.

Results

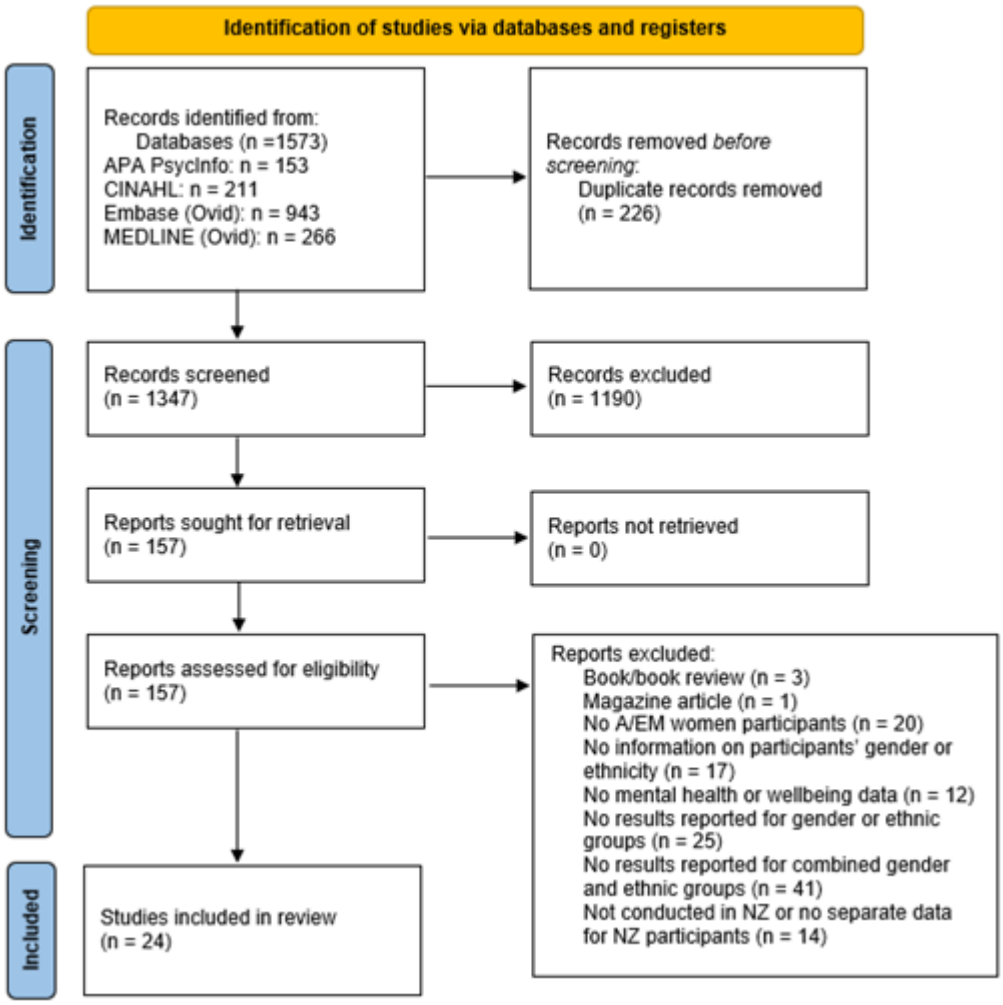
The searches retrieved 1,573 records, of which 226 were identified as duplicates and removed. The title and abstracts of the remaining 1,347 records were screened, and the full text was reviewed for 157 studies. Only 24 studies met the inclusion criteria and were included in this review. Most excluded studies either did not report the participants' gender or ethnicity, or did not provide disaggregated data for them (Figure 1).

1. Overview of the included studies

Overall, the included studies provided data on approximately 15,000 Asian and MELAA women and girls aged over 12 years living in New Zealand. They were published between 1992 and 2023. All studies provided data on Asian women. Three studies exclusively investigated Asian women.[20–22] Seven studies focussed on Asian populations, including women and men,[23–27] or boys and girls.[28,29] The other 14 studies also included MELAA participants but only two reported disaggregated data for MELAA women and girls.[30,31]

In terms of specific population groups, two included studies focussed on secondary school and/or undergraduate students.[32,33] Seven studies focussed on perinatal women.[31,34–39] Only one of these studies provided disaggregated data for MELAA women/girls.[31] The other six studies with perinatal women were analyses from the Growing Up in New Zealand study (GUiNZ) that separately reported data for Asian women/girls but combined the data for MELAA women/girls in the "other" category (including other ethnicities).[34–39] In

Figure 1: PRISMA study flow diagram.



PRISMA = Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

addition, five studies investigated New Zealand residents over 15 years old,[30,40–43] providing data mostly on Asian women/girls—only one also provided disaggregated data for MELAA women.[30]

The included studies investigated a wide range of concepts and outcomes related to mental health and mental wellbeing, which can be reported into two broad domains. First, prevalence and symptoms of mental health conditions and psychological wellbeing (n=18).[20,23–31,33,34,37,39–43] Second, associations of socio-demographic factors with mental health conditions (n=9).[20–23,32,35,36,38,41] Three studies reported findings related to both domains.[20,23,41] The tables of included studies presented exclusively describe the key findings specific to Asian and MELAA women and girls.

2. Prevalence and symptoms of mental health conditions and mental wellbeing

The review findings highlight the use of a variety of approaches to measure the prevalence of mental health conditions and mental wellbeing. The first approach was using questionnaires and scales or reviewing secondary mortality data to identify the prevalence of mental health conditions in Asian and MELAA women and girls and assess symptoms (n=10) (Table 1a). These included minor psychiatric symptomatology (i.e., higher levels of distress that could lead to psychiatric disorders; n=1),[20] eating disorder symptomatology (n=2),[24,25] general mental health (n=2),[23,41] depression (n=4),[32,35,36,38] stress (n=2),[34,39] self-esteem and life satisfaction (n=1)[33] and suicide (n=1).[28]

The second approach to assess the prevalence of mental health conditions was used in five studies (Table 1b). It involved analysing medicine prescription and use for specific conditions, viz., dementia,[30] depression in pregnancy[31,37] and psychosis.[42,43]

The third approach was through the proxy indicator of mental health service use (Table 1c). Three studies provided data related to the use of support services, i.e., for autism spectrum disorder (ASD),[29] public mental health services[40] and a helpline for Chinese speakers.[27]

3. Associations of mental health with socio-demographic factors

Among the 24 included studies, nine analysed a range of factors commonly associated with mental health outcomes (Table 2). Two studies explored the impact of migration or refugee status.[21,22] Three studies examined associations of socio-demographic factors (such as age, education, socio-economic status and depressive symptoms) with perinatal depression,[36,38] one with minor psychiatric morbidity[20] and two with general mental health.[23] One study investigated intimate partner physical conflict and prenatal perceived stress.[35] One study estimated the impact of neighbourhood fragmentation (described as compositional factors that can fragment social connections within a neighbourhood)[41] and another investigated the relationship between sexuality and gender with depressive symptoms, suicide attempts and the wellbeing of secondary school students.[32]

Discussion

To the best of our knowledge, this is the first scoping review to examine the available evidence on mental health and wellbeing of Asian and MELAA women and girls in New Zealand and identify related knowledge gaps. The included studies estimated outcomes through symptom screening and proxy measures (prescription medicine use and factors associated with mental health) and association with different socio-demographic factors. Nevertheless, this review revealed a lack of robust data to estimate population-level prevalence rates or service use for mental health conditions in Asian and MELAA women and girls in New Zealand. Where these data exist, they are drawn from studies that have focussed on very few mental health conditions, are limited to certain population groups (e.g., specific ethnic groups within Asian communities) and are not evenly distributed across all settings (e.g., outside Auckland) in which Asian and MELAA women and girls live. This review provides limited data on Asian and MELAA migrant women and girls, particularly from smaller ethnic sub-groups and indicates that data for other intersecting groups (such as the rainbow community and women with disabilities) are even more scarce.

The included studies provided information regarding the prevalence of only a few mental health conditions—ASD,[29] dementia,[30] depression,[34,39] eating disorders,[24,25] minor psychiatric morbidity,[20] psychosis[42,43] and suicide.[28] Where data were available, they indicated gender differences in the Asian sub-group. Asian women/girls were at higher risk of depression,[26] being prescribed anti-psychotics,[43] experiencing a minor mental health condition[23] or having body dissatisfaction than their male counterparts.[25] On the other hand, Asian women/girls represented fewer cases of

young suicide deaths,[28] adult schizophrenia[42] and young ASD diagnoses.[29] In addition, while Asian and MELAA women/girls and men/boys presented similar rates of public mental health services use,[40] Asian women/girls were more likely to use the helpline for Chinese speakers.[27]

Differences between ethnic groups in women were also noted, with Asian women and girls at higher risk of antenatal depression than European women and girls.[39] However, at the same time, Asian women and girls had lower rates of antenatal antidepressant use compared to European women and girls,[31,37] suggesting limited access to mental health services. The findings also suggest a negative association between poor mental health outcomes and a range of socio-demographic factors, such as migration or refugee status,[22] gender identity and sexuality[32] and intimate partner conflict.[35] Furthermore, prevalent structural barriers to health services access in New Zealand[16] were reported by migrant and refugee women.[21,22] These included financial constraints (cost of healthcare), language barriers (access and quality of interpreter services), lack of information on the health system and health services (obstacles navigating the health system) and logistical barriers (lack of knowledge on how to access health services). Thus, Asian and MELAA women and girls may need targeted support to know where and how to seek culturally responsive mental health services.

Asians are a very heterogeneous group comprising 37 sub-ethnicities. However, most studies that provided disaggregated data limited them to Asian women and girls, as they constitute most of the ethnic minority population in New Zealand.[44] Using "Asians" as a category is ineffective, as it masks the lived realities and specific needs of smaller ethnic groups within the Asian ethnicity.[45] This issue is also observed in the broad and diverse MELAA group. Despite Asian and MELAA communities being one of the fastest growing communities, we found only three studies that specifically investigated the mental health of Asian women, [20–22] and none focussed on MELAA women. Even for the Asian community, only a few sub-ethnic groups (i.e., Bhutanese, Chinese, Indian, Korean and Pakistani) were included.

New Zealand has a growing population of Asian and MELAA ethnic migrant women and girls.[44] However, lack of funding for studies focussed on their health[46] leads to scarce mental health research for these women and girls. Our scoping review indicates very little data on Asian and MELAA women and girls, with a small range of conditions studied and few Asian and MELAA subgroups. Data specific to Asian and MELAA women and girls need to be recognised as a priority area to support clinical practice and evidence-based designing, planning and implementation of policies and programmes for these populations. Future studies could sample Asian and MELAA women and girls to achieve adequate explanatory power. We also recommend studies with the general population to provide disaggregated data for all gender and ethnic groups, separately and combined, when applicable. Cross-sectional studies are needed to expand the current limited number of culturally validated measurement tools. It is also important to engage Asian and MELAA communities in research and policy spaces, including their voice in decision-making.

Most studies (n=17) provided data that could only be partially extracted due to a lack of disaggregated data for Asian and MELAA women/girls for all the relevant outcomes. Three studies did not report the total number of participating Asian and MELAA women/girls.[31,38,43] Thus, the exact number of Asian and MELAA women and girls included in this review is unclear (approximately 15,000). Seven studies included MELAA women and girls but did not provide disaggregated data for this group.[34–39] Five studies analysing results from the GUiNZ survey did not provide disaggregated data for Asian women and girls in all analyses related to perinatal depression.[34,36–39] Three studies compared outcomes related to mental health between ethnic groups but did not account for gender.[30,40,42] Another three studies also did not account for gender and ethnicity combined in all analyses.[26,33,43] Three studies with Asian participants also did not provide disaggregated data for women/girls for all outcomes.[23,24,27]

Thus, we could not extract all relevant data, even though they existed in the raw dataset. Similarly, many studies did not meet the inclusion criteria due to a lack of disaggregated results for women/girls, Asian and MELAA participants, or both combined (e.g., outcomes reported for women/girls and Asian and MELAA participants but not for Asian and MELAA women/girls). The way through which authors reported outcomes limited the findings of this review. Authors face word limits for publications and report what is relevant to their research questions. Data on small or minority population groups may be lost in primary studies with diverse populations and no disaggregated data.

The main strengths of this review include its focus on Asian and MELAA women and girls, and its robust search process, adapted to four databases, using an extensive list of medical subject headings (and their synonyms) related to mental health conditions, with no date limits. We included both quantitative studies measuring indicators of mental health and wellbeing and qualitative studies revealing the perspectives of Asian and MELAA women and girls on their experience as migrant or ethnic women in New Zealand. This review only included published research articles. Other types of studies could complement the available evidence if ethnicity and gender disaggregated data are provided.

This review highlighted that peer-reviewed studies investigating the mental health and wellbeing of Asian and MELAA women and girls in New Zealand are scarce. The available evidence has heterogeneous populations and outcomes. Most data were drawn from studies that did not specifically investigate mental health issues in Asian and MELAA women/girls and frequently did not present disaggregated data for Asian and MELAA women/girls for all reported outcomes. Thus, this review indicates significant gaps in our understanding of the mental health needs of these populations. The lack of relevant data implies that the current policies, service provisions and resource allocations may not align with present needs, relying instead on sporadic and, in some instances, obsolete data. With growing populations in New Zealand, studies focussed on Asian and MELAA women and girls represent a key priority to enhance their wellbeing and promote equitable health outcomes. Additional data could inform the development and implementation of policies, strategies and programmes that address the needs of these growing populations and provide culturally and gender-responsive services.

Table 1a: Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Abbott et al. 1999,[23] cross-sectional.	Chinese migrants; Auckland.	173; unclear.	Cases and severity of non-psychotic mental disorders: 12-item version of the Chinese Health Questionnaire (CHQ-12), a culturally validated adaptation of the General Health Questionnaire (GHQ).	Women were at greater risk of minor mental health conditions than men (p-value and total scores not reported).
Bécares and Atatoa-Carr 2016,[34] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	1,091 (Asian); mean age 30.01 years (SD 4.7).	Prenatal perceived stress: 10-item Perceived Stress Scale (PSS). Symptoms of prenatal and postnatal depression: Edinburgh Prenatal and Postnatal Depression Scale (EDS and EPDS, respectively).	Asian women reported low prenatal perceived stress (mean score=12.85, SD=6.2). 17.2% had prenatal depression, 13.1% had postnatal depression.
Chan et al. 2010,[25] cross-sectional.	Korean migrants; Auckland.	72; unclear.	Eating-disorder symptomatology, i.e., disordered eating behaviours, feelings about one's body and psychological correlates commonly present in (but not exclusive to) anorexia nervosa and bulimia nervosa: Eating Disorder Inventory (EDI; max score 42, with greater values indicating higher levels of disordered eating behaviours).	EDI total mean score of Korean women was 34.1 (SD 20.0). The mean scores for the subscales (ranging from 1, never, to 6, always, with greater values indicating higher levels of disordered eating behaviours) were: drive for thinness = 5.5 (SD 5.3), interoceptive awareness = 3.7 (SD 3.8), bulimia = 2.5 (SD 2.7), body dissatisfaction = 8.8 (SD 6.0), ineffectiveness = 2.5 (SD 2.8), maturity fears = 5.72 (SD 4.1), interpersonal distrust = 3.24 (SD 3.3). Compared to men, women had a higher score for body dissatisfaction and a lower score for maturity fears.

Table 1a (continued): Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Chan and Owens 2006,[24] cross-sectional.	Chinese migrants; Auckland.	179; unclear.	Eating-disorder symptomatology (definition as per above): EDI.	Total scores not reported, mean scores for the subscales: drive for thinness = 4.5 (SD 4.8), interoceptive awareness = 3.4 (SD 4.2), bulimia = 1.4 (SD 2.6), body dissatisfaction = 9.6 (SD 7.0), ineffectiveness = 3.5 (SD 3.5), maturity fears = 6.4 (SD 4.5), interpersonal distrust = 3.1 (SD 2.9).
Cheung and Spears 1992,[20] cross-sectional.	Chinese women; Dunedin.	127; 18–80 years.	Minor psychiatric morbidity (i.e., higher levels of distress that could lead to psychiatric disorders): 28-item version of the GHQ-28.	21.3% presented minor psychiatric morbidity.
Goh et al. 2021,[28] retrospective, population-based descriptive.	Asians aged 10 to 24 years who died from suicide (2002 to 2017 inclusive); New Zealand.	29; 12–24 years (no suicide deaths recorded for 10- and 11-year-old Asians).	Prevalence of suicide, calculated based on suicide mortality rates described in the Mortality Review Database at the University of Otago.	Prevalence rate among Asian young women and girls: 3.2 per 100,000. Women represented 31.8% of young Asians who died from suicide.
Ivory et al. 2011,[41] cross-sectional.	Permanent New Zealand residents over 15 years old; New Zealand.	668 (Asian); over 15 years.	2002/2003 data from the New Zealand Health Survey: Australian and New Zealand version of the 36-Item Short Form Survey (SF-36; max score 100, with higher scores indicating better mental health status).	In Asian women/girls, the SF-36 Mental Health Scale mean score = 82.3, 95% CI 81.2 to 83.5.
Montayre et al. 2022,[26] cross-sectional.	Asians living in New Zealand.	676; unclear.	Depression: Kessler Psychological Distress Scale (K10) and the Short-Form 12-Item Health Survey Mental Component Score (SF-12 MCS). Data from the 2016/2017 New Zealand Health Survey cohort.	Among Asians diagnosed with depression, 71.9% were women. Compared to Asian men, Asian women had a significant increased risk for depression: K10 adjusted odds ratio (aOR) = 2.60 (1.37 to 4.94); SF-12 MCS aOR = 2.36 (1.26 to 4.42; p<.01).

Table 1a (continued): Studies that provided data on the prevalence of mental health conditions in Asian and MELAA women.

Study ID and design	Study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Key findings related to mental health of Asian and MELAA women/girls
Reese et al. 2017,[33] cross-sectional.	Māori, Chinese and European school and university students aged 12 to 21 years; New Zealand.	48; 12–21 years.	Depression: 30-item Reynolds Adolescent Depression Scale – 2nd edition (max score 120, with greater values indicating higher symptoms of depression). Self-esteem: 10-item Rosenberg Self-Esteem Inventory (max score 30, with greater values indicating higher self-esteem). Life satisfaction: 5-item Satisfaction with Life Scale (max score 35, with greater values indicating higher satisfaction with life).	The mean scores among Chinese young women and girls ranged from: 60.7 to 63.9 for severity of depressive symptoms, indicating none to minimal depressed mood (i.e., ≤75); 19.4 to 20.5 for self-esteem, indicating a normal range (between 15 and 25); 22.8 to 24.21 for satisfaction with life, indicating participants were "slightly satisfied" (between 22 and 25).
Waldie et al. 2015,[39] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	802 (Asian); unclear.	Perceived maternal stress: PSS. Symptoms of prenatal depression: EDS.	Asian women approximately twice as likely to suffer from antenatal depression than European women (n=3,168; p<0.01; disaggregated total scores for Asian women not reported).

MELAA = Middle Eastern, Latin American and African; SD = standard deviation; CHQ-12 = Chinese Health Questionnaire; GHQ = General Health Questionnaire; PSS = Perceived Stress Scale; EDS and EPDS = Edinburgh Prenatal and Postnatal Depression Scale; EDI = Eating Disorder Inventory; SF-36 = 36-Item Short Form Survey; CI = confidence interval; K10 = Kessler Psychological Distress Scale; SF-12 MCS = Short-Form 12-Item Health Survey Mental Component Score; aOR = adjusted odds ratio.

Table 1b: Studies that provided data on the prevalence of medicine prescription and use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chan et al. 2023,[30] retrospective, population-based descriptive.	Individuals diagnosed with dementia; New Zealand.	1,515 (Asian); all ages included.	Prevalence of anti-dementia medication use: rate between the number of individuals with a diagnosis of dementia and anti-dementia medication dispensing rates, retrieved from New Zealand's Integrated Data Infrastructure (IDI).	Of the women using anti-dementia medication from 2016 to 2020, Asian women constituted 4.2 to 5.1% and non-Asian ethnic women constituted 0.5 to 0.6%.
Donald et al. 2021,[31] retrospective, population-based descriptive.	Pregnant women aged 15 to 49 years prescribed with antidepressants from 2005 to 2014; New Zealand.	100,488 Asian and 51,600 MELAA pregnancies; unclear.	Antidepressant dispensing patterns: number of pregnancies from the New Zealand pregnancy cohort with one or more dispensing of any antidepressants.	Asian women and girls: dispensing rates increased from 0.5% to 1.7%; MELAA women and girls: from 2.9% to 6.8%. Compared to European/other ethnicity pregnancies (n=347,419), Asian and MELAA pregnancies were less commonly dispensed with antidepressants. In Asians, the adjusted risk ratio (aRR) ranged from 0.17 (95% CI 0.15 to 0.19) to 0.24 (95% CI 0.22 to 0.24). In MELAA, the difference was smaller, with the aRR ranging from 0.87 (95% CI 0.83 to 0.91) to 0.91 (95% CI 0.84 to 0.91). Asian pregnancies were less likely to have at least one dispensing in trimester 2 or 3 than European/other ethnicity pregnancies (aRR 0.59, 95% CI 0.53 to 0.66). This difference was not observed in MELAA pregnancies (aRR 0.96, 95% CI 0.91 to 1.01). The rate of continued use of medication was also lower in Asian pregnancies (29.1%) than in European/other pregnancies (44.2%), whereas for MELAA pregnancies this rate was similar (43.8%).

Table 1b (continued): Studies that provided data on the prevalence of medicine prescription and use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Svardal et al. 2022,[37] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	1,092 (Asian); unclear.	Rate of unmedicated depression based on symptoms of prenatal depression (measured through the EPDS) and use of antidepressant (based on self-report).	Asian women (n=1,092) had the lowest rate of antenatal antidepressant use (0.7%) compared to Pacific peoples (0.9%, n=1,160), Māori (2.4%, n=1,260), Other (2.7%, n=310) and European women (4.8%, n=4,210).
Wheeler et al. 2008,[42] retrospective, population-based descriptive.	Adult schizophrenia outpatients; Auckland.	118 (Asian); unclear.	Antipsychotic medication: medication charts and clinical notes.	From 2000 to 2004, the proportion of women among adult Asians dispensed with medication for schizophrenia increased from 38.7% to 44.1%.
Wilkinson and Mulder 2018,[43] retrospective, population-based descriptive.	Individuals over 15 years old prescribed an antipsychotic; New Zealand.	Unclear; over 15 years.	Antipsychotic prescribing data from the Pharmaceutical Management Agency of New Zealand (PHARMAC).	In 2015, less than 1% of Asian women and girls were prescribed antipsychotics, with this rate increasing with age. Asian women and girls were less prescribed antipsychotics compared to women and girls from other ethnic groups, across all age groups. Asian women and girls across all age groups were more likely to be prescribed antipsychotics compared to Asian men and boys, at an overall rate of 1.25 times.

MELAA = Middle Eastern, Latin American and African; IDI = Integrated Data Infrastructure; aRR = adjusted risk ratio; CI = confidence interval; EPDS = Edinburgh Postnatal Depression Scale; PHARMAC = Pharmaceutical Management Agency of New Zealand.

Table 1c: Studies that provided data on the prevalence of mental health services use in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chow and Mulder 2017,[40] retrospective, population-based descriptive.	Individuals who used public mental health services from 2008 to 2013; New Zealand.	5,007 (Asian); unclear.	Mental health service utilisation: demographic data from the Programme for the Integration of Mental Health Data (PRIMHD) on patients who presented at least once to public mental health service.	Women represented 52.43% of Asians using public mental health services (reasons for using this service not described).
Htut et al. 2020,[29] retrospective, population-based descriptive.	Asian children under 20 years diagnosed with autism spectrum disorder (ASD) in 2016; Auckland.	130; under 20 years.	Profiling of Asian children with ASD under 20 years: demographic data from the Ministry of Health's Disability Support Services	Young women and girls diagnosed with ASD were Chinese (n=38), Indian (n=25), Filipino (n=13), Korean (n=9), Indonesian (n=5), Sri Lankan (n=5), Cambodian (n=3), Vietnamese (n=3), other (not Japanese, Pakistani, Thai, Burmese, Malay, Laotian; n=4), Afghani (n=1) and Bangladeshi (n=1). Asian women and girls (across all ages, including adults) constituted 18.7% of all women and girls allocated to support services for ASD, and a similar percentage of all Asians (19.3%).
Yang Dong 2016,[27] retrospective, population-based descriptive.	Users of the Chinese Lifeline; New Zealand.	133; unclear.	Demographic characteristics of users. Presenting symptoms.	Most callers were women (90.5%). Presenting symptoms for women not reported.

MELAA = Middle Eastern, Latin American and African; PRIMHD = Programme for the Integration of Mental Health Data; ASD = autism spectrum disorder.

Table 2: Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Abbott et al. 1999,[23] cross-sectional.	Chinese migrants; Auckland.	173; unclear.	Cases and severity of non-psychotic mental disorders: CHQ-12.	Married women with children living without their spouse were significantly more likely to be classified as "suffering from mental disorder" than those with a resident spouse (25% vs 9%, p=0.02).
Akhtar et al. 2022,[21] cross-sectional.	Adult Pakistani women living in New Zealand for <5 years.	200; 18–54 years.	Questionnaire about challenges in accessing and understanding the New Zealand healthcare system.	Most women (87%) believed they still needed information on the New Zealand healthcare system, including that on mental health, particularly perinatal and child mental health.
Bird et al. 2021,[35] cross-sectional.	Pregnant women; Auckland, Counties Manukau and Waikato.	883 (Asian); unclear.	Prenatal perceived stress: PSS. Symptoms of prenatal depression: EPDS. Prevalence of intimate partner physical conflict (multiple-choice questions) and its association with stress and depression.	Higher perceived stress was associated with increased odds of intimate partner conflict (in the past month; OR=1.07), which was reported by 20% of Asian participants.
Chiang et al. 2017,[32] cross-sectional.	Secondary school students; New Zealand.	851 (Asian); unclear.	Symptoms of depression: Reynolds Adolescent Depression Scale-Short Form (RADS-SF). Attempted suicide: closed question (yes/no). General psychological wellbeing: WHO-5 Wellbeing Index.	Among Chinese and East Asian girls: 13.4% of SG majority and 21.8% of SG minority reported significant depressive symptoms. The latter had lower odds of significant depressive symptoms (OR 0.46, 95% CI 0.28 to 0.76) than NZ European SG minority girls.

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Chiang et al. 2017,[32] cross-sectional (continued).	Secondary school students; New Zealand (continued).	851 (Asian); unclear (continued).	Symptoms of depression: Reynolds Adolescent Depression Scale-Short Form (RADS-SF). Attempted suicide: closed question (yes/no). General psychological wellbeing: WHO-5 Wellbeing Index. Questions about gender and sexuality to categorise students into sexual and/or gender (SG) majority (exclusively sexually attracted to the opposite sex) or SG minority (sexually attracted to people of the same sex, both sexes or those who were not sure about this) (continued).	3.1% of SG majority and 5.2% of SG minority reported suicide attempts. The latter had lower odds of significant suicide attempts than NZ European SG minority girls (OR 0.29, 95% CI 0.12 to 0.70). 56.7% of SG majority and 67.8% of SG minority reported good wellbeing. The latter had higher odds of reporting good wellbeing (OR 2.07, 95% CI 1.23 to 3.48) than NZ European SG minority girls. Among Indian and other Asian girls: 15.2% of SG majority and 36% of SG minority reported significant depressive symptoms. The latter had similar depressive symptoms to NZ European SG minority girls. 6.5% of SG majority (n=367) and 11% of SG minority reported suicide attempts. The latter had similar depressive symptoms to NZ European SG minority girls. 74.2% of SG majority and 52.5% of SG minority reported good wellbeing. The latter had similar depressive symptoms to NZ European SG minority girls but lower odds of reporting good wellbeing than Chinese and East Asian girls SG majority girls (OR 0.38, 95% CI 0.21 to 0.67).

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Cheung and Spears 1992,[20] cross-sectional.	Chinese women; Dunedin.	127; 18–80 years.	Minor psychiatric symptomatology (i.e., higher levels of distress that could lead to psychiatric disorders): GHQ-28.	Higher rates of minor psychiatric morbidity among those born in China, those who were living in New Zealand for 10 years or more, had migrated for family reasons and spoke English less frequently.
Farewell et al. 2022,[36] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	797 (Asian); unclear.	Growth mixture modelling to identify resources (demographic data) associated with low risk for perinatal depression (assessed with the EPDS and 9-item Patient Health Questionnaire [PHQ-9]).	14.1% of Asians were classified as at low risk of depression. In Asian perinatal women, internal and external resources (such as age, education, income, spirituality, neighbourhood integration, community belonging) were not associated with low risk for depression.
Ivory et al. 2011,[41] cross-sectional.	Permanent residents over 15 years old; New Zealand.	668 (Asian); over 15 years.	Associations between mental health (SF-36; max score 100, with higher scores indicating better mental health status) and neighbourhood fragmentation (measured with the New Zealand Index of Neighbourhood Social Fragmentation).	In Asian women and girls, the SF-36 mental health scale mean score was not associated with neighbourhood social fragmentation.
Shrestha-Ranjit et al. 2020,[22] qualitative case study.	Bhutanese refugee women; Palmerston North or Feilding.	32; 18–82 years.	Effectiveness of primary healthcare services in addressing mental health needs of women refugees. Information collected via focus group discussion; thematic analysis used.	Participants reported their mental health deteriorated due to traumatic refugee journeys and resettlement challenges in New Zealand, such as language barriers, loneliness, family separation, financial constraints, pressure to find paid work and uncertainty about the future. Lack of awareness about available mental health supports or services, despite wanting to access them.

Table 2 (continued): Studies that provided data on associations of mental health with socio-demographic factors in Asian and MELAA women.

Study ID and design	Overall study population and location	Number and age of Asian and MELAA women/girls in the study	Mental health–related investigation and measurements	Available data related to mental health of Asian and MELAA women/girls
Underwood et al. 2017,[38] longitudinal cohort.	Pregnant women; Auckland, Counties Manukau and Waikato.	Unclear; unclear,	Associations between symptoms of prenatal and postnatal depression (EPD, EPDS).	Asian women with antenatal or postpartum depression symptoms (ADS or PDS) were more likely to have ADS (OR 1.80, 95% CI 1.21 to 2.69), PDS (OR 1.86, 95% CI 1.20 to 2.88), or ADS+PDS OR 2.40, 95% CI 1.21 to 4.79) than Asians with no depression symptoms.

MELAA = Middle Eastern, Latin American and African; CHQ-12 = 12-item Chinese Health Questionnaire; PSS = prenatal perceived stress; EPD/EPDS = Edinburgh Postnatal Depression Scale; OR = odds ratio; RADS-SF = Reynolds Adolescent Depression Scale-Short Form; WHO = World Health Organization; SG = sexuality and/or gender; CI = confidence interval; GHQ-28 = 28-item General Health Questionnaire; PHQ-9 = Patient Health Questionnaire 9-item; SF-36 = 36-item Short Form Survey; ADS = antenatal depression symptoms; PDS = postpartum depression symptoms.

COMPETING INTERESTS
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Appendix: Search strategies

Appendix Table 1: Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
1	(wom*n or female? or girl?).mp.	1,339,169
2	(migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	46,484
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	521,086
4	(mental health or mental hygiene or mental well* or emotional well*).mp.	292,388
5	(psychologi* stres* or life stres* or psychological stressor).mp.	22,212
6	(anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	317,463
7	(depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	530,575
8	(PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	54,326
9	(psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	200,749
10	(self injur* or self harm or self destructive behavio?r? or automutilation).mp.	18,623
11	suicide?.mp.	69,313
12	(eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	53,780
13	(somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	11,740

Appendix Table 1 (continued): Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
14	((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	17,199
15	(sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	46,433
16	(neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	265,889
17	(dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	117,756
18	(separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	295,651

Appendix Table 1 (continued): Database: APA PsycInfo <1,806 to July Week 2 2023>.

#	Query	Results
19	(New Zealan* or Aotearoa or NZ).mp.	15,044
20	2 or 3	546,977
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	1,530,672
22	1 and 19 and 20 and 21	154
23	limit 22 to english language	153

Appendix Table 2: Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
1	exp female/ or wom*n.mp. or female?.mp. or girl?.mp.	11,651,326
2	exp migrant/ or exp refugee/ or exp ethnic group/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	254,525
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	3,743,566
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	420,510
5	exp physiological stress/ or (psychologi* stres* or life stres* or psychological stressor).mp.	343,420
6	exp anxiety/ or exp anxiety disorder/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	666,735
7	exp depression/ or exp mood disorder/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	1,153,597
8	exp posttraumatic stress disorder/ or exp adjustment disorder/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	90,854

Appendix Table 2 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
9	exp psychosis/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	371,055
10	exp automutilation/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	29,439
11	exp suicide/ or suicide?.mp.	126,315
12	exp eating disorder/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	180,016
13	exp somatoform disorder/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	33,413
14	exp sleep disorder/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	303,659
15	exp sexual dysfunction/ or exp paraphilic disorder/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	108,395
16	exp disorders of higher cerebral function/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	1,170,337

Appendix Table 2 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
17	exp dissociative disorder/ or exp personality disorder/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	169,858
18	exp mental disease/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	2,625,125
19	(New Zealan* or Aotearoa or NZ).mp.	126,159
20	2 or 3	3,836,230
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	4,017,589
22	1 and 19 and 20 and 21	945
23	limit 22 to English language	943

Appendix Table 3: Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
1	exp female/ or wom*n.mp. or female?.mp. or girl?.mp.	11,651,326
2	exp migrant/ or exp refugee/ or exp ethnic group/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	254,525
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	3,743,566
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	420,510
5	exp physiological stress/ or (psychologi* stres* or life stres* or psychological stressor).mp.	343,420
6	exp anxiety/ or exp anxiety disorder/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	666,735
7	exp depression/ or exp mood disorder/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	1,153,597
8	exp posttraumatic stress disorder/ or exp adjustment disorder/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	90,854
9	exp psychosis/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	371,055
10	exp automutilation/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	29,439
11	exp suicide/ or suicide?.mp.	126,315

Appendix Table 3 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
12	exp eating disorder/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	180,016
13	exp somatoform disorder/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	33,413
14	exp sleep disorder/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	303,659
15	exp sexual dysfunction/ or exp paraphilic disorder/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	108,395
16	exp disorders of higher cerebral function/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	1,170,337
17	exp dissociative disorder/ or exp personality disorder/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	169,858

Appendix Table 3 (continued): Database: Embase <1,980 to 2023 July 17>.

#	Query	Results
18	exp mental disease/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	2,625,125
19	(New Zealan* or Aotearoa or NZ).mp.	126,159
20	2 or 3	3,836,230
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	4,017,589
22	1 and 19 and 20 and 21	945
23	limit 22 to English language	943

Appendix Table 4: Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
1	exp women/ or wom*n.mp. or female?.mp. or girl?.mp.	10,057,537
2	(exp transients/ and migrants/) or exp refugees/ or exp "ethnic and racial minorities"/ or (migrant? or refugee? or asylum seeker? or displaced person? or international student? or ethnic minorit* or racial minorit*).mp.	64,005
3	(asia* or philippines or filipin* or cambodi* or vietna* or burmese or myanmar or indonesi* or lao? or malay* or thai* or china or chinese or hong kong or Taiwan* or singapore or india* or bengali or punjabi or sikh or sri lanka* or sinhalese or japan* or korea* or afghan* or bangladesh? or nepal? or pakistan? or tibet* or eurasia* or bhutan* or maldivia* or mongolia* or middle east* or algeria* or arab? or assyrian? or egypt* or iran* or persian? or iraq* or israel* or jordania* or kurd* or leban* or morroc* or palestin* or syria* or turk* or latin america* or argentin* or bolivia* or brazil* or chile* or colombia* or ecuador* or mexic* or peru or peruvian? or puerto ric* or uruguay* or venezuela* or africa* or jamaica* or kenya* or nigeria* or caribbean? or somali* or eritrea* or ethiopia* or ghana* or burundi* or congo* or sudan* or zambia* or zimbabwe*).mp.	2,773,725
4	exp mental health/ or (mental health or mental hygiene or mental well* or emotional well*).mp.	278,546
5	exp stress, psychological/ or (psychologi* stres* or life stres* or psychological stressor).mp.	162,566
6	exp anxiety/ or exp anxiety disorders/ or (anxi* or angst or hypervigilance or nervousness or panic or phobi*).mp.	370,810
7	exp depression/ or exp mood disorders/ or exp mania/ or (depress* or bipolar or manic or mood disorder? or affective disorder? or melancholia? or dysphoria or dysthymi? or paraphrenia? or psychos?s or premenstrual or manias or hypomani or cyclothymi).mp.	782,722
8	exp stress disorders, post-traumatic/ or exp adjustment disorders/ or (PTSD or post-traumatic stress disorder? or post-traumatic neuroses or moral injur* or reactive disorder? or adjustment disorder? or anniversary reaction? or transient situational disturbance?).mp.	61,078
9	exp psychotic disorders/ or (psychotic disorder? or psychos?s or schizo* or delusional disorder?).mp.	244,920
10	exp self-injurious behavior/ or (self injur* or self harm or self destructive behavio?r? or automutilation).mp.	89,318
11	exp suicide/ or suicide?.mp.	103,093

Appendix Table 4 (continued): Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
12	exp "feeding and eating disorders"/ or exp "feeding and eating disorders of childhood"/ or (eating disorder? or appetite disorder? or anorexia or avoidant restrictive food intake disorder or ARFID or food neophobia? or binge-eating or bulimia or diabulimia or compulsive eating or night eating syndrome? or orthorexia or obsessive healthy eating or pica or allotriophagy or geophagia or rumination syndrome? or merycism or rumination disorder? or dysmorphi* or body image dis*).mp.	87,011
13	exp somatoform disorders/ or (somatoform disorder or medically unexplained syndrome? or somati?ation or briquet syndrome or pain disorder or somatic symptom disorder or conversion disorder).mp.	25,863
14	exp "sleep initiation and maintenance disorders"/ or ((disorders of initiating and maintaining sleep) or insomnia? or sleep initiation dysfunction? or sleeplessness or early awakening or nightmare disorder).mp.	35,486
15	exp sexual dysfunction, physiological/ or exp sexual dysfunctions, physiological/ or exp paraphilic disorders/ or (sex* disorder? or sexual behavio?r disorder? or sexual dysfunction? or vaginismus or dyspareunia or psychosexual or hypoactive sexual desire disorder or sexual aversion disorder? or orgasmic disorder? or sexual arousal disorder? or frigidity or paraphili* or sex deviation?).mp.	56,873
16	exp neurocognitive disorders/ or (neurocognitive disorder? or kandinsky or clerambault or psychotic or organic mental disorders or mild neurocognitive disorders or nonpsychotic organic brain syndrome or dementia? or amentia? or alzheimer? or aphasia? or PPA syndrome? or mesulam or creutzfeldt or encephalopath* or binswanger or leukoencephalopathy* or cadasil or diffuse neurofibrillary tangles with calcification or kosaka-shibayama or frontotemporal lobar degeneration? or FTLD? or wilhelmsen-lynch or picks disease? or huntington or kluver-bucy or lewy body or amnesia? or cognition disorders or overinclusion or auditory perceptual disorder? or auditory processing disorder? or psychoacoustical disorder? or acoustic perceptual disorder? or auditory perceptual disorder? or auditory comprehension disorder? or auditory inattention? or consciousness disorder? or disorder? of consciousness or semiconsciousness or level altered consciousness or altered level of consciousness or delirium? or dyslexia? or word blindness* or acquired reading disabilit* or alexia? or visual verbal agnosia?).mp.	598,722
17	exp dissociative disorders/ or exp personality disorders/ or exp depersonalization/ or (dissociative or fugue or personality disorder? or multiple identity disorder? or multiple personalit* or dual personalit* or inadequate personality or as if personality or impulse-ridden personality or antisocial or sociopathic or psychopathic or dyssocial behavio?r? or borderline or compulsive personalit* or passive-dependent personality or hysterical or histrionic or paranoid or passive-aggressive personalit* or depersonali?ation? or dereali?ation?).mp.	127,051

Appendix Table 4 (continued): Database: Ovid MEDLINE(R) Epub Ahead of Print, In Process & Other Non-Indexed Citations, Ovid MEDLINE (R) Daily and Ovid MEDLINE (R) <1,946-Present>.

#	Query	Results
18	exp neurodevelopmental disorders/ or (separation anxiety or attention deficit or oppositional defiant disorder or behavio?r* disorder? or ADHD or ADDH or hyperkinetic syndrome? or minimal brain dysfunction or conduct disorder? or callous-unemotional trait? or sluggish cognitive tempo? or development dis* or obsessive-compulsive or dermatillomania or skin picking or trichotillomania? or hoarding disorder? or obsessive hoarding or anankastic or autis* or kanner? or asperger or communicat* disorder? or communicative dysfunction? or communication disabilit* or language disorder? or agraphia? or dysgraphia? or anomia or dysphasia? or reading disorder? or reading disabilit* or language development* disorder? or speech delay? or semantic-pragmatic disorder? or central auditory processing disorder or language delay? or specific language impairment or speech disorder? or cluttering? or fluency disorder? or dyslalia? or rhinolalia? or aprosodi* or dysglossia? or alogia? or logasthenia? or logagnosia? or logamnesia? or word deafness or anepia? or dejerine-lichtheim or lichtheim? or agrammatic* or speech sound disorder? or phonological disorder? or delay disorder? or development deviation? or intellectual disabilit* or mental retardation? or idiocy or mental deficienc* or learning dis* or developmental academic dis* or dyscalculia? or acalculia? or motor skills disorder? or developmental coordination disorder? or mutism? or attachment disorder? or stereotypic movement disorder? or body rocking or head-banging or tic disorder? or tourette).mp.	341,705
19	(New Zealan* or Aotearoa or NZ).mp.	83,449
20	2 or 3	2,806,420
21	4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18	2,393,923
22	1 and 19 and 20 and 21	267
23	limit 22 to English language	266