VU VRIJE UNIVERSITEIT AMSTERDAM

VU Research Portal

Probability of major depression diagnostic classification based on the SCID, CIDI and MINI diagnostic interviews controlling for Hospital Anxiety and Depression Scale – Depression subscale scores

Wu, Yin; Levis, Brooke; Sun, Ying; Krishnan, Ankur; He, Chen; Riehm, Kira E.; Rice, Danielle B.; Azar, Marleine; Yan, Xin Wei; Neupane, Dipika; Bhandari, Parash Mani; Imran, Mahrukh; Chiovitti, Matthew J.; Saadat, Nazanin; Boruff, Jill T.; Cuijpers, Pim; Gilbody, Simon; McMillan, Dean; Ioannidis, John P.A.; Kloda, Lorie A.

published in
Journal of Psychosomatic Research
2020

DOI (link to publisher)
10.1016/j.jpsychores.2019.109892

document version
Publisher's PDF, also known as Version of record

document license
Article 25fa Dutch Copyright Act

Link to publication in VU Research Portal

citation for published version (APA)
Wu, Y., Levis, B., Sun, Y., Krishnan, A., He, C., Riehm, K. E., Rice, D. B., Azar, M., Yan, X. W., Neupane, D., Bhandari, P. M., Imran, M., Chiovitti, M. J., Saadat, N., Boruff, J. T., Cuijpers, P., Gilbody, S., McMillan, D., Ioannidis, J. P. A., ... Thombs, B. D. (2020). Probability of major depression diagnostic classification based on the SCID, CIDI and MINI diagnostic interviews controlling for Hospital Anxiety and Depression Scale – Depression subscale scores: An individual participant data meta-analysis of 73 primary studies. *Journal of Psychosomatic Research*, *129*, 1-9. [109892]. https://doi.org/10.1016/j.jpsychores.2019.109892

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:
vuresearchportal.ub@vu.nl

Download date: 11. Dec. 2021

Journal of Psychosomatic Research 129 (2020) 109892

Contents lists available at ScienceDirect

Journal of Psychosomatic Research

journal homepage: www.elsevier.com/locate/jpsychores

Probability of major depression diagnostic classification based on the SCID, CIDI and MINI diagnostic interviews controlling for Hospital Anxiety and Depression Scale – Depression subscale scores: An individual participant data meta-analysis of 73 primary studies

Yin Wu[a,b,c], Brooke Levis[a,b], Ying Sun[a], Ankur Krishnan[a], Chen He[a], Kira E. Riehm[a,d], Danielle B. Rice[a,e], Marleine Azar[a,b], Xin Wei Yan[a], Dipika Neupane[a,b], Parash Mani Bhandari[a,b], Mahrukh Imran[a], Matthew J. Chiovitti[a], Nazanin Saadat[a], Jill T. Boruff[f], Pim Cuijpers[g], Simon Gilbody[h], Dean McMillan[h], John P.A. Ioannidis[i], Lorie A. Kloda[j], Scott B. Patten[k,l,m], Ian Shrier[a,b,n], Roy C. Ziegelstein[o], Melissa Henry[a], Zahinoor Ismail[p,q,r], Carmen G. Loiselle[a,s,t,u], Nicholas D. Mitchell[v,w], Marcello Tonelli[r], Samir Al-Adawi[x], Anna Beraldi[y], Anna P.B.M. Braeken[z,aa,ab], Natalie Büel-Drabe[ac], Adomas Bunevicius[ad,ae], Gregory Carter[af,ag], Chih-Ken Chen[ah,ai], Gary Cheung[aj], Kerrie Clover[ak], Ronán M. Conroy[al], Daniel Cukor[am], Carlos E. da Rocha e Silva[an], Eli Dabscheck[ao,ap], Federico M. Daray[aq,ar], Elles Douven[as], Marina G. Downing[at,au], Anthony Feinstein[av,aw], Panagiotis P. Ferentinos[ax,ay], Felix H. Fischer[az], Alastair J. Flint[ba,bb], Maiko Fujimori[bc], Pamela Gallagher[bd], Milena Gandy[be], Simone Goebel[bf], Luigi Grassi[bg,bh], Martin Härter[bi], Josef Jenewein[bj,bk], Nathalie Jetté[bl], Miguel Julião[bm], Jae-Min Kim[bn], Sung-Wan Kim[bo], Marie Kjærgaard[bp,bq], Sebastian Köhler[br], Wim L. Loosman[bs], Bernd Löwe[bt], Rocio Martin-Santos[bu,bv], Loreto Massardo[bw], Yutaka Matsuoka[bx,by], Anja Mehnert[bz], Ioannis Michopoulos[ax], Laurent Misery[ca], Ricard Navines[bu,bv], Meaghan L. O'Donnell[cb], Ahmet Öztürk[cc], Jurate Peceliuniene[cd], Luis Pintor[ce,cf], Jennie L. Ponsford[at,au], Terence J. Quinn[cg], Silje E. Reme[ch,ci], Katrin Reuter[cj], Alasdair G. Rooney[ck,cl], Roberto Sánchez-González[cm,cn,co], Marcelo L. Schwarzbold[cp], Vesile Senturk Cankorur[cq], Juwita Shaaban[cr], Louise Sharpe[cs], Michael Sharpe[ct], Sébastien Simard[cu,cv,cw], Susanne Singer[cx], Lesley Stafford[cy,cz], Jon Stone[da], Serge Sultan[db,dc], Antonio L. Teixeira[dd,de], Istvan Tiringer[df], Alyna Turner[dg,dh,di], Jane Walker[ct], Mark Walterfang[dj,dk,dl], Liang-Jen Wang[dm], Jennifer White[ap], Dana K. Wong[at,dn], Andrea Benedetti[b,do,dp,*,1], Brett D. Thombs[a,b,c,e,dp,dq,**,1]

[a] Lady Davis Institute for Medical Research, Jewish General Hospital, Montréal, QC, Canada
[b] Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montréal, QC, Canada
[c] Department of Psychiatry, McGill University, Montréal, QC, Canada
[d] Department of Mental Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA
[e] Department of Psychology, McGill University, Montréal, QC, Canada
[f] Schulich Library of Physical Sciences, Life Sciences, and Engineering, McGill University, Montreal, QC, Canada
[g] EMGO Institute, Vrije Universiteit Amsterdam, the Netherlands
[h] Hull York Medical School and the Department of Health Sciences, University of York, Heslington, York, UK
[i] Department of Clinical, Neuro and Developmental Psychology, Department of Medicine, Department of Health Research and Policy, Department of Biomedical Data Science, Department of Statistics, Stanford University, Stanford, CA, USA
[j] Library, Concordia University, Montréal, QC, Canada
[k] Departments of Community Health Sciences and Psychiatry, University of Calgary, Calgary, AB, Canada

* Correspondence to: A. Benedetti, Centre for Outcomes Research & Evaluation, Research Institute of the McGill University Health Centre, 5252 Boulevard de Maisonneuve, Montréal, QC H4A 3S5, Canada.
** Correspondence to: B. D. Thombs, Jewish General Hospital, 4333 Cote Ste Catherine Road; Montreal, QC H3T 1E4, Canada.
E-mail addresses: andrea.benedetti@mcgill.ca (A. Benedetti), brett.thombs@mcgill.ca (B.D. Thombs).

https://doi.org/10.1016/j.jpsychores.2019.109892

0022-3999/ © 2019 Elsevier Inc. All rights reserved.

[l] Mathison Centre for Mental Health Research & Education, University of Calgary, Calgary, Canada
[m] Cuthbertson & Fischer Chair in Pediatric Mental Health, University of Calgary, Calgary, Canada
[n] Department of Family Medicine, McGill University, Montréal, QC, Canada
[o] Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD, USA
[p] Hotchkiss Brain Institute & O'Brien Institute for Public Health, Calgary, AB, Canada
[q] Department of Psychiatry, Clinical Neuroscience and Community Health Sciences, University of Calgary, Calgary, AB, Canada
[r] Cumming School of Medicine, University of Calgary, Calgary, AB, Canada
[s] Ingram School of Nursing, McGill University, Montréal, QC, Canada
[t] Centre for Nursing Research, Jewish General Hospital, Montréal, QC, Canada
[u] Department of Oncology, Faculty of Medicine, McGill University, Montréal, QC, Canada
[v] Department of Psychiatry, University of Alberta, Edmonton, AB, Canada
[w] Alberta Health Services, Edmonton, AB, Canada
[x] Department of Behavioural Medicine, College of Medicine & Health Sciences, Sultan Qaboos University, Oman, Oman
[y] Psychotherapie und Psychsomatik, kbo Lech-Mangfall-Klinik für Psychatrie, Garmisch-Partenkirchen, Bayern, Germany
[z] Department of Radiation Oncology (MAASTRO), GROW - School for Oncology and Developmental Biology, Maastricht University Medical Centre, Maastricht, the Netherlands
[aa] Faculty of Psychology, Open University of the Netherlands, Heerlen, the Netherlands
[ab] Department of Health Services Research, CAPHRI School for Public Health and Primary, Maastricht University, Maastricht, the Netherlands
[ac] Department of Psychiatry and Psychotherapy, University Hospital Zürich, Zürich, Switzerland
[ad] Harvard University, Boston, MA, USA
[ae] Lithuanian University of Health Sciences, Kaunas, Lithuania
[af] University of Newcastle, Australia
[ag] Calvary Mater Newcastle, Australia
[ah] Community Medicine Research Center, Keelung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Keelung, Taiwan
[ai] Department of Psychiatry, Keelung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Keelung, Taiwan
[aj] University of Auckland, Auckland, New Zealand
[ak] Centre for Brain and Mental Health Research, University of Newcastle, NSW, Australia
[al] Royal College of Surgeons in Ireland Division of Population Health Sciences, Dublin, Ireland
[am] Rogosin Institute, NY, New York, USA
[an] Clementino Fraga Filho University Hospital, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil
[ao] The Alfred Hospital, Prahran, VIC, Australia
[ap] Monash University, Melbourne, Australia
[aq] National Scientific and Technical Research Council, Buenos Aires, Argentina
[ar] Institute of Pharmacology, School of Medicine, University of Buenos Aires, Buenos Aires, Argentina
[as] Alzheimer Center Limburg and School for Mental Health and Neuroscience (MHeNs), Department of Psychiatry and Neuropsychology, Maastricht University, Maastricht, the Netherlands
[at] School of Psychological Sciences, Monash University, Melbourne, VIC, Australia
[au] Monash Epworth Rehabilitation Research Centre, Epworth HealthCare, Melbourne, VIC, Australia
[av] University of Toronto, Toronto, ON, Canada
[aw] Sunnybrook Health Sciences Centre, Toronto, ON, Canada
[ax] 2nd Department of Psychiatry, Attikon General Hospital, National and Kapodistrian University of Athens, Athens, Greece
[ay] Institute of Psychiatry, Psychology & Neuroscience, King's College London, UK
[az] Department of Psychosomatic Medicine, Center for Internal Medicine and Dermatology, Charité – Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany
[ba] University Health Network, Toronto, ON, Canada
[bb] Department of Psychiatry, University of Toronto, Toronto, ON, Canada
[bc] Section of Psychological Science, Division of Health Care Research, Center for Public Health Sciences, National Cancer Center, Tokyo, Japan
[bd] School of Psychology, Dublin City University, Dublin, Ireland
[be] The Department of Psychology, Macquarie University, Sydney, Australia
[bf] Department of Clinical Psychology and Psychotherapy, Institute of Psychology, Christian-Albrechts University, Kiel, Germany
[bg] Institute of Psychiatry, Department of Biomedical and Specialty Surgical Sciences, University of Ferrara, Ferrara, Italy
[bh] Psychiatric Unit, Integrated Department of Mental Health and Addictive Behavior, Health Trust, University Hospital, Ferrara, Italy
[bi] Department of Medical Psychology, University of Hamburg, Hamburg, Germany
[bj] Clinic Zugersee, Center for Psychiatry and Psychotherapie, Oberwil-Zug, Switzerland
[bk] University of Zurich, Zurich, Switzerland
[bl] Departments of Neurology and Population Health Science and Policy, Icahn School of Medicine at Mount Sinai, NY, New York, USA
[bm] Equipa Comunitária de Suporte em Cuidados Paliativos de Sintra, Portugal
[bn] Chonnam National University Medical School, Republic of Korea
[bo] Department of Psychiatry, Chonnam National University Medical School, Republic of Korea
[bp] Endocrinology Research Group, Medical Clinic, University Hospital of North Norway, Norway
[bq] Department of Internal Medicine, Kolding Hospital, Hospital Lillebaelt, Denmark
[br] Department of Psychiatry and Neuropsychology, School for Mental Health and Neuroscience, Maastricht University, Maastricht, the Netherlands
[bs] Onze Lieve vrouw Gasthuis, Amsterdam, the Netherlands
[bt] Department of Psychosomatic Medicine and Psychotherapy, University Medical Center Hamburg-Eppendorf, Hamburg, Germany
[bu] Department of Psychiatry and Psychology, Hospital Clinic, IDIBAPS, CIBERSAM, Barcelona, Spain
[bv] Department of Medicine, Institute of Neuroscience, University of Barcelona, Barcelona, Spain
[bw] Centro de Biología Celular y Biomedicina, Facultad de Medicina y Ciencia, Universidad San Sebastián. Santiago, Chile
[bx] Division of Health Care Research, Center for Public Health Sciences, National Cancer Center, Tokyo, Japan
[by] Lifestyle Medicine, Cooperative Graduate Program, The Jikei University Graduate School of Medicine, Tokyo, Japan
[bz] Department of Medical Psychology and Medical Sociology, University of Leipzig, Germany
[ca] Department of Dermatology, University Hospital of Brest, Brest, France
[cb] Phoenix Australia, Carlton, VIC, Australia
[cc] Bezmialem Vakif University, Istanbul, Turkey
[cd] Clinic of Internal Diseases, Family Medicine and Oncology, Vilnius University Faculty of Medicine, Vilnius, Lithuania
[ce] Consultation Liaison Psychiatry Unit, Hospital Clínico de Barcelona, Barcelona, Spain
[cf] Instituto de Investigaciones Biomédicas Augusto Pi i Sunyer (IDIBAPS), Barcelona, Spain
[cg] Institute of Cardiovascular and Medical Sciences, University of Glasgow, Glasgow, UK
[ch] Department of Psychology, Faculty of Social Sciences, University of Oslo, Oslo, Norway
[ci] Department of Pain Management and Research, Oslo University Hospital, Oslo, Norway
[cj] Private Practice for Psychotherapy and Psycho-oncology, Freiburg, Germany

[ck] Division of Psychiatry, University of Edinburgh, Edinburgh, UK
[cl] Robert Fergusson Unit, Royal Edinburgh Hospital, NHS Lothian, Edinburgh, UK
[cm] Department of Psychiatry, Institut de Neuropsiquiatria i Addiccions, Centre Emili Mira, Parc de Salut Mar, Barcelona, Spain
[cn] IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain
[co] Centro de Investigación Biomédica En Red de Salud Mental (CIBERSAM), Barcelona, Spain
[cp] Department of Internal Medicine, Federal University of Santa Catarina, Florianópolis, Santa Catarina, Brazil
[cq] Ankara University Faculty of Medicine Psychiatry Department, Ankara, Turkey
[cr] Department of Family Medicine, School of Medical Sciences, Universiti Sains Malaysia, Kelantan, Malaysia
[cs] School of Psychology, The University of Sydney, Sydney, NSW, Australia
[ct] University of Oxford, Oxford, UK
[cu] Département des sciences de la santé, Université du Québec à Chicoutimi (UQAC), QC, Canada
[cv] Centre intersectoriel en santé durable (CISD), QC, Canada
[cw] Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec (IUCPQ), QC, Canada
[cx] Institute of Medical Biostatistics, Epidemiology and Informatics, University Medical Centre Mainz, Mainz, Germany
[cy] Centre for Women's Mental Health, Royal Women's Hospital, Parkville, Australia
[cz] Melbourne School of Psychological Sciences, University of Melbourne, Melbourne, Australia
[da] University of Edinburgh, Edinburgh, UK
[db] Université de Montréal, QC, Canada
[dc] CHU Sainte-Justine, Montréal, QC, Canada
[dd] University of Texas Health Science Center at Houston, Houston, TX, USA
[de] Santa Casa BH Ensino & Pesquisa, Belo Horizonte, Brazil
[df] Institute of Behavioral Sciences, Pécs University, Medical School, Pécs, Hungary
[dg] IMPACT Strategic Research Centre and School of Medicine, Barwon Health, Deakin University, Geelong, VIC, Australia
[dh] Faculty of Health and Medicine, School of Medicine and Public Health, The University of Newcastle, Callaghan, NSW, Australia
[di] Department of Psychiatry, Royal Melbourne Hospital, University of Melbourne, Parkville, VIC, Australia
[dj] Neuropsychiatry Unit, Royal Melbourne Hospital, Melbourne, Australia
[dk] Melbourne Neuropsychiatry Centre, University of Melbourne, Melbourne, Australia
[dl] Florey Institute of Neuroscience and Mental Health, Melbourne, Australia
[dm] Department of Child and Adolescent Psychiatry, Kaohsiung Chang Gung Memorial Hospital and Chang Gung University College of Medicine, Kaohsiung, Taiwan
[dn] School of Psychology & Public Health, La Trobe University, Melbourne, Australia
[do] Respiratory Epidemiology and Clinical Research Unit, McGill University Health Centre, Montréal, QC, Canada
[dp] Department of Medicine, McGill University, Montréal, QC, Canada
[dq] Department of Educational and Counselling Psychology, McGill University, Montréal, QC, Canada

ARTICLE INFO

Keywords:
Depressive disorders
Diagnostic interviews
Hospital Anxiety and Depression Scale
Individual participant data meta-analysis
Major depression

ABSTRACT

Objective: Two previous individual participant data meta-analyses (IPDMAs) found that different diagnostic interviews classify different proportions of people as having major depression overall or by symptom levels. We compared the odds of major depression classification across diagnostic interviews among studies that administered the Depression subscale of the Hospital Anxiety and Depression Scale (HADS-D).

Methods: Data accrued for an IPDMA on HADS-D diagnostic accuracy were analysed. We fit binomial generalized linear mixed models to compare odds of major depression classification for the Structured Clinical Interview for DSM (SCID), Composite International Diagnostic Interview (CIDI), and Mini International Neuropsychiatric Interview (MINI), controlling for HADS-D scores and participant characteristics with and without an interaction term between interview and HADS-D scores.

Results: There were 15,856 participants (1942 [12%] with major depression) from 73 studies, including 15,335 (97%) non-psychiatric medical patients, 164 (1%) partners of medical patients, and 357 (2%) healthy adults. The MINI (27 studies, 7345 participants, 1066 major depression cases) classified participants as having major depression more often than the CIDI (10 studies, 3023 participants, 269 cases) (adjusted odds ratio [aOR] = 1.70 (0.84, 3.43)) and the semi-structured SCID (36 studies, 5488 participants, 607 cases) (aOR = 1.52 (1.01, 2.30)). The odds ratio for major depression classification with the CIDI was less likely to increase as HADS-D scores increased than for the SCID (interaction aOR = 0.92 (0.88, 0.96)).

Conclusion: Compared to the SCID, the MINI may diagnose more participants as having major depression, and the CIDI may be less responsive to symptom severity.

1. Introduction

Different types of standardized diagnostic interviews are commonly used to classify major depression in research. Semi-structured interviews, for example, the Structured Clinical Interview for DSM (SCID) [1], are designed to be administered by clinically trained professionals with experience in diagnosis; they allow evaluators to ask additional questions and to use their judgement to determine whether or not symptoms are present [2–4]. Fully structured interviews, on the other hand, such as the Composite International Diagnostic Interview (CIDI) [5], were designed specifically to address the costliness of using clinician-administered interviews in epidemiological surveys and can be administered by trained lay interviewers. The CIDI is fully scripted, and thus interviewers are instructed not to explain or rephrase symptoms; its developers emphasized that they were hoping to achieve a high level of reliability for large-scale survey work with the possible loss of validity of diagnoses [5]. The Mini International Neuropsychiatric Interview (MINI) [6,7] is a very brief fully structured interview that was originally designed for potential use as a screening instrument [7]. As described by its developers, it is intended to be over-inclusive in classifying disorders [7].

Despite the different designs and intended uses of semi-structured interviews, fully structured interviews (MINI excluded), and the MINI, these instruments are typically treated as equivalent reference standards for major depression classification in research, including in evidence syntheses [8]. Only five small studies, which each included only 6–22 cases of major depression based on semi-structured interviews and

[1] Co-senior authors.

8–61 cases based on fully structured interviews, have directly compared different types of diagnostic interviews for major depression [3,9–12]. In the three studies that included >100 participants, prevalence of major depression was substantially higher based on fully structured interviews compared to semi-structured interviews [3,9,12]. Only in a study of patients from an alcoholic treatment unit, where depressive symptoms would be expected to be much more severe, major depression prevalence was similar when assessed with semi-structured and fully structured interviews [11].

Recently, we used an individual participant data meta-analysis (IPDMA) approach in two studies to compare the probability of major depression classification across diagnostic interviews [13,14]. In the first, which included 17,158 participants from 57 primary studies, participant characteristics and depressive symptom severity were controlled using Patient Health Questionnaire-9 (PHQ-9) scores. Among fully structured interviews, the MINI classified depression approximately twice as often as the CIDI. Compared to semi-structured interviews, fully structured interviews (MINI excluded) classified more patients with low-level depressive symptoms but fewer participants with high-level symptoms as depressed [13]. Similar findings were observed in a second IPDMA of 46 studies that included 12,759 women who were pregnant or had recently given birth [14]. Controlling for Edinburgh Postnatal Depression Scale (EPDS) scores, the MINI classified more participants as having major depression than the CIDI, while as EPDS scores increased, both the CIDI and MINI classified fewer participants as having depression than the SCID [14]. These findings highlight that different diagnostic interviews may classify different proportions of patients with major depression or be more or less responsive to symptom levels in samples comprised of a range of participants, including women in pregnancy and postpartum.

Neither of the two previous IPDMAs focused on diagnosis primarily in people with medical conditions. Because only two large studies have been conducted to date it is important to test the generalizability of findings in different populations, including people with medical conditions. The Depression subscale of the Hospital Anxiety and Depression Scale (HADS-D) [15] is commonly used to assess depressive symptom severity in medically ill patients. The HADS was designed specifically for use in people with physical health problems and to avoid somatic items that are common in both depression and many other medical conditions [15]. The objective of the present study was to use an IPDMA approach to examine patterns between diagnostic interviews and the proportion of participants classified as having major depression among studies that administered the HADS-D. As in previous studies [13,14], first we compared major depression classification odds within fully structured interviews (MINI vs. CIDI), and then between fully structured and semi-structured interviews (CIDI vs. SCID and MINI vs. SCID), to determine if different interviews influenced the odds of being classified as having major depression. In each case, we controlled for participant characteristics and depressive symptom severity based on HADS-D scores. Second, we tested whether differences in the probability of classification across the three types of interviews were associated with depressive symptom severity by including an interaction term.

2. Methods

We registered the main analyses of the HADS-D IPDMA in PROSPERO (CRD42015016761) and published a protocol [16]. We reported the results of the present study following PRISMA-DTA [17] and PRISMA-IPD [18] reporting guidelines. We did not plan at the time of registration and publication of our protocol to conduct analyses that compared diagnostic interviews, but results from previous studies [13,14] indicated that there may be important differences between interviews and that this should be tested before evaluating diagnostic test accuracy.

2.1. Inclusion criteria

For the main IPDMA, datasets from articles in any language were eligible for inclusion if (1) they included diagnostic classification for current Major Depressive Disorder (MDD) or Major Depressive Episode (MDE) using Diagnostic and Statistical Manual of Mental Disorders (DSM) [19–22] or International Classification of Diseases (ICD) [23] criteria based on a validated semi-structured or fully structured interview; (2) they included total scores for the HADS-D; (3) the diagnostic interview and HADS-D were administered within 2 weeks of each other, because DSM and ICD major depression diagnostic criteria specify that symptoms must have been present in the last 2 weeks; (4) participants were ≥ 18 years of age; and (5) patients were not from psychiatric settings or already identified as having symptoms of depression, since screening is done to identify unrecognized cases. Datasets where not all participants were eligible were included if primary data allowed selection of eligible participants. For the present study, we only included studies that assessed major depression using the SCID [1], CIDI [5], or MINI [6,7], because the majority of identified studies (i.e., >90%) utilised these interviews.

2.2. Data sources and study selection

We searched Medline, Medline In-Process & Other Non-Indexed Citations and PsycINFO via OvidSP, and Web of Science via ISI Web of Knowledge from inception to June 14, 2016, using a peer-reviewed [24] search strategy that was developed by an experienced medical librarian (Appendix A). We additionally reviewed reference lists from relevant reviews and queried authors who contributed datasets about non-published studies. We uploaded search results into RefWorks (RefWorks-COS, Bethesda, MD, USA); after de-duplication, unique citations were uploaded into DistillerSR (Evidence Partners, Ottawa, Canada) to manage the search process and data extraction.

Two investigators reviewed titles and abstracts for eligibility, independently. If either identified a study as potentially eligible, full-text review was done by two investigators, also independently. Any disagreements were resolved by consensus, with a third investigator consulted as necessary. Translators were consulted for languages for which team members were not fluent.

2.3. Data extraction and synthesis

We invited authors of eligible datasets to contribute de-identified primary data. As necessary, we emailed corresponding authors of eligible primary studies up to three times. If we did not receive a response, we emailed study co-authors and attempted to contact corresponding authors by phone.

Diagnostic interview used, health care setting, and country of primary studies were extracted from published articles by two investigators independently, and disagreements were resolved by consensus. Countries were categorized as “very high” or “high” development based on the United Nations' Human Development Index. This is a statistical composite index that includes indicators of life expectancy, education, and income (no included studies had “low” or “medium” status) [25]. Participant-level data included age, sex, health care setting (when studies included participants from multiple settings), HADS-D scores, and major depression status (major depression case or non-case). For major depression classification, we considered MDD or MDE based on the DSM or ICD, and if more than one was reported, we prioritized DSM over ICD. We prioritized DSM since it was more commonly used in included studies, and we prioritized MDE over MDD, because screening is done to attempt to detect depressive episodes, and further assessments must be done to determine if the episode is related to MDD, bipolar disorder or persistent depressive disorder [22].

We converted individual participant data to a standard format and synthesized with study-level data into a single dataset. We compared

published participant characteristics and screening accuracy results with results from raw datasets, and we resolved any discrepancies in consultation with the original investigators. For the present study, we only included data from participants with complete data for all variables in analyses.

2.4. Statistical analyses

We estimated the association between the diagnostic interview used and probability of major depression using binomial generalized linear mixed models (GLMMs) with a logit link function. Models controlled for depressive symptom severity using continuous HADS-D scores, age (continuous), sex, country Human Development Index (very high or high), and health care setting (inpatient specialty care, outpatient specialty care, non-medical care, or mixed inpatient and outpatient). These covariates were chosen due to their potential influence on depression status and availability in primary studies. To account for correlation between participants within the same primary study, a random intercept was fit for each study. Fixed slopes were estimated for HADS-D score, diagnostic interview, age, sex, Human Development Index, and patient care setting.

First, we estimated GLMMs among fully structured interviews, to compare odds of major depression classification for the MINI vs. the CIDI. Second, we estimated GLMMs to compare odds of major depression classification for the CIDI vs. the SCID and the MINI vs. SCID, separately. Third, we investigated possible interactions between depressive symptom severity (based on continuous HADS-D scores) and 1) MINI vs. CIDI, 2) CIDI vs. SCID, and 3) MINI vs. SCID by adding an interaction term to each model.

All analyses were run in R (R version R 3.5.1 and R Studio version 1.1.463) (R [26]; RStudio [27]) using the glmer function within the lme4 package [28].

3. Results

Of 10,015 unique titles and abstracts identified from the database search, 9584 were excluded after title and abstract review, and 264 were excluded after full text review, leaving 167 eligible articles with

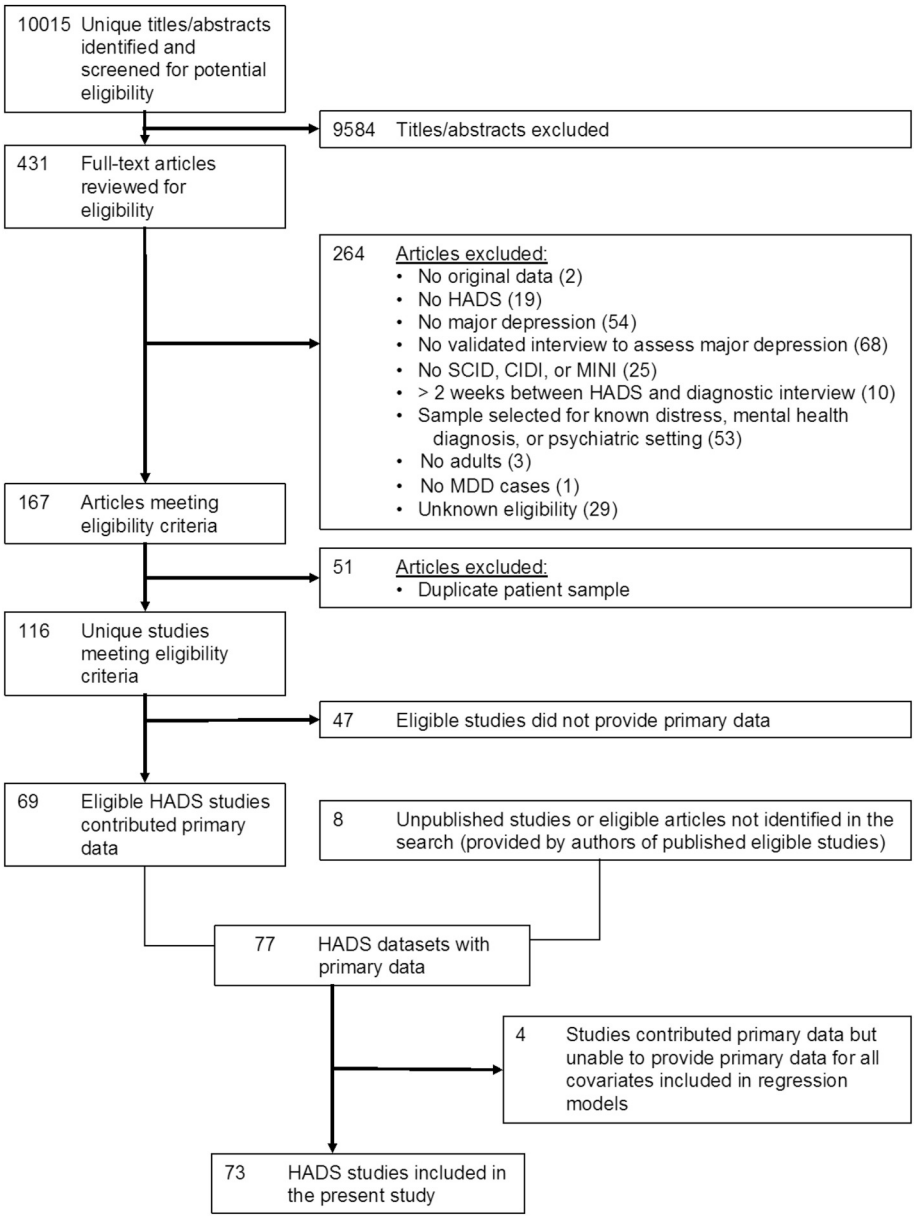


Fig. 1. Flow diagram of study selection process.

data from 116 unique samples, of which 69 (59% of datasets; 71% of participants) contributed data (Fig. 1). Reasons why articles were excluded at the full-text level are provided in Appendix B. Authors of included studies contributed data from an additional five unpublished studies and three additional eligible studies not identified in the search, for a total of 77 datasets. However, four primary datasets did not include data for key covariates included in analyses (age, sex) and were excluded, leaving 73 primary datasets included in the present study. Included study characteristics are shown in Appendix C. Table C.1. Characteristics of eligible studies that did not provide data for the present study are shown in Appendix C. Table C.2.

In total, 15,856 participants (1942 [12%] with major depression) were included (Table 1). Of the 73 included studies, there were 36 SCID studies (5488 participants, 11% major depression), 10 CIDI studies (3023 participants, 9% major depression), and 27 MINI studies (7345 participants, 15% major depression). As shown in Table 2, of the 15,856 included participants, 15,335 (97%) were non-psychiatric medical patients, 164 (1%) were partners of medical patients, and 357 (2%) were healthy adults.

As shown in Fig. 2 and Appendix D, across interviews, the proportion of participants classified with major depression generally increased as HADS-D scores increased. Model coefficients for each analysis are reported in Table 3 and Appendix E (Tables E.1 to E.6). Among fully structured interviews, controlling for HADS-D scores, the MINI was more likely to classify participants as having major depression than the CIDI, but there was some imprecision in estimates (adjusted odds ratio [aOR] = 1.70; 95% confidence interval [CI] = 0.84–3.43). Compared with the semi-structured SCID, the MINI classified major depression more often (aOR for MINI vs. SCID = 1.52; 95% CI = 1.01–2.30). Odds of major depression classification were similar for the CIDI and the SCID (aOR for CIDI vs. SCID = 1.09, 95% CI = 0.56–2.13).

As HADS-D scores increased, the odds of major depression classification increased more for the MINI than for the CIDI (interaction aOR = 1.07, 95% CI = 1.03–1.12), but increased less for the CIDI than for the SCID (interaction aOR for CIDI = 0.92, 95% CI = 0.88–0.96). The interaction was not statistically significant for the comparison between the MINI and the SCID (interaction aOR for MINI = 0.99, 95% CI = 0.96–1.02).

4. Discussion

We compared the odds of being classified as having major depression according to three diagnostic interviews, controlling for participant characteristics and depressive symptom severity using IPDMA. Although different types of diagnostic interviews are used in research, semi-structured interviews, which allow queries with clinical judgement, such as the SCID, most closely replicate standard diagnostic criteria administered by a trained evaluator [2–4]. Our study found that, first, compared with the SCID, the MINI, which is a very brief fully structured diagnostic tool, classifies significantly more participants as having major depression. Second, the CIDI, which is also fully structured, classifies a similar proportion of people as having major depression overall as the SCID; however, it is less sensitive to increases in symptom levels, and the odds of diagnosis do not increase as much as symptoms increase.

These findings among the HADS-D studies in the population of medically ill patients are similar to findings from two previous IPDMAs which examined the PHQ-9 and EPDS. In the first, which included 17,158 participants from 57 studies who were administered the PHQ-9, the MINI classified substantially more patients as depressed than other fully structured interviews, primarily the CIDI. Compared to semi-structured interviews, fully structured interviews (MINI excluded) were less sensitive to increases in depressive symptoms [13]. The study did not directly compare the MINI and semi-structured interviews, including the SCID.

In the second IPDMA, which included data from 12,759 women in pregnancy or postpartum from 46 studies who were administered the EPDS [14], the odds of depression classification were again greater for the MINI than the CIDI; the CIDI and MINI tended to classify major depression less often than the SCID, but there was high uncertainty in estimates. Neither the CIDI or MINI was as responsive as the SCID to higher symptom levels in terms of increased odds of diagnosis. Only 3 included studies, however, used the CIDI, which was a limitation.

Based on results from the present study and the two previous studies, it appears that the MINI may classify higher proportion of people as having major depression than the semi-structured SCID and that the CIDI may be less responsive to symptom increases than the SCID. These findings may be associated with characteristics of the different interviews. The MINI was originally designed as a screening instrument and was intended to be over-inclusive in classifying psychiatric disorders [7]. For the CIDI, the lack of sensitivity to different levels of depressive symptoms could be that, rather than specifically addressing symptoms in the last 2 weeks, the CIDI evaluates symptoms in the last 12 months and lifetime, then asked respondents if those symptoms, generally, have been present recently using a single question.

Strengths of the present study were that we used a very large IPDMA dataset, that findings were generally consistent with results from two other large studies that used IPDMA [14, 15, and that the study was done in a sample largely comprised of medically ill patients. Although two previous IPDMAs identified some patterns of the performance of different diagnostic instruments, estimates of association were somewhat imprecise. Therefore, it is critical to understand if the patterns identified for the SCID, CIDI, and MINI in other participant groups hold for medically ill patients, which is the most common group for which the HADS is used. There are, nonetheless, limitations to consider. First, we could not include primary data for just under 30% of eligible participants. Second, across all interviews, especially the CIDI, there were few participants who had HADS-D scores at the higher end of the score spectrum. Finally, about one fifth of SCID studies did not provide descriptions of interviewer qualifications. It is possible that the use of less qualified interviewers could have possibly reduced performance differences across interviews. However, in present study, there were not enough data points for us to adjust for this.

5. Conclusion

Among primary studies that administered the HADS-D, we found that compared with the SCID, the MINI and CIDI may misclassify major depression, which is generally consistent with findings from previous studies that were conducted with similar methods in other populations [14, 15]. The MINI and CIDI are the most commonly used fully structured interviews for major depression. They are fully scripted and can be administered by lay research staff, but they may not perform equivalently to SCID, which is a semi-structured interview and more closely replicates diagnostic procedures as administered by a qualified health care professional. The findings from the present study and previous IPDMAs suggest that the MINI may diagnose more participants as having major depression and that the CIDI may be less sensitive to increases in depressive symptoms. In research, including in clinical trials, investigators should take into consideration the advantages and

Table 1
Participant data by diagnostic interview.

Diagnostic interview	N studies	N participants	N (%) major depression
SCID	36	5488	607 (11)
CIDI	10	3023	269 (9)
MINI	27	7345	1066 (15)
Total	73	15,856	1942 (12)

Abbreviations: CIDI: Composite International Diagnostic Interview; MINI: Mini International Neuropsychiatric Interview, SCID: Structured Clinical Interview for DSM Disorders.

Table 2
Categorizations of diseases of included patients[a].

Disease type	N studies	N participants	N (%) major depression
Cancer	16	4048	292 (7)
Cardiovascular disease	16	2299	248 (11)
Neurological disease	12	1477	397 (27)
General medicine: ambulatory	6	3437	478 (14)
General medicine: inpatients	4	1169	142 (12)
Infectious disease	4	750	110 (15)
Other[b]	3	521	27 (5)
Renal disease	3	293	69 (24)
Traumatic injury	2	1013	156 (15)
Endocrinology	2	428	63 (15)
Dermatology	2	138	22 (16)
Autoimmune disease	1	128	28 (22)
Sleep disorder	1	100	30 (30)
Lung disease	1	55	1 (2)
Total	73	15,856	1942 (12)

[a] More specific information on each included study characteristics are provided in Appendix C. Table C.1.
[b] Other includes spouses of medical patients and health adults.

Table 3
Comparison of major depression classification odds across diagnostic interviews.

Diagnostic interview comparison	Adjusted odds ratio[a] OR (95% CI)	Adjusted odds ratio OR for interaction[b] (95% CI)
MINI vs. CIDI	1.70 (0.84, 3.43)[c]	1.07 (1.03, 1.12)[c]
CIDI vs. SCID	1.09 (0.56, 2.13)	0.92 (0.88, 0.96)[c]
MINI vs. SCID	1.52 (1.01, 2.30)[c]	0.99 (0.96, 1.02)[c]

Abbreviations: CIDI: Composite International Diagnostic Interview; HADS-D: Depression subscale of Hospital Anxiety and Depression Scale; MINI: Mini International Neuropsychiatric Interview; SCID: Structured Clinical Interview for DSM Disorders.
[a] No interaction; adjusted for HADS-D score, age, sex, country human development index, and patient care setting.
[b] Including an interaction between diagnostic interview and HADS-D score; adjusted for HADS-D score, age, sex, country human development index, and patient care setting.
[c] In these models, the default optimizer in glmer failed to converge, thus bobyqa was used instead.

disadvantages of different diagnostic interviews, including resources required to use each of them, when choosing different instruments and interpreting findings.

Contributors

YW, BLevis, JTB, PC, SG, DM, JPAI, LAK, SBP, IS, RCZ, MHenry, ZI, CGL, NDM, MT, ABenedetti and BDT were responsible for the study conception and design. JTB and LAK designed and conducted database searches to identify eligible studies. SA, ABeraldi, APBMB, NBD, ABunevicius, GCarter, CKC, GCheung, KC, RMC, DC, CED, ED, FMD, ED, MGD, AF, PPF, FHF, AJF, MF, PG, MG, SG, LG, MHärter, JJ, NJ, MJ, MKeller, SK, JMK, SWK, MKjærgaard, BLöwe, WLL, RMS, LMassardo, YM, AM, IM, LMisery, RN, MLO, MO, JP, LP, JLP, TJQ, SER, KR, AGR, RSG, MLS, VSC, JS, LSharpe, SSimard, SSinger, LStafford, IT, KYT, AT, JW, MW, LJW, and DKW contributed primary datasets that were included in this study. YW, BLevis, YS, AK, CH, KER, DBR, MA, YXW, DN, PMB, MI, TAS, MJC, and NS contributed to data extraction and coding for the meta-analysis. YW, BLevis, ABenedetti and BDT contributed to the data analysis and interpretation. YW, BLevis, ABenedetti, and BDT contributed to drafting the manuscript. All authors provided a critical review and approved the final manuscript. ABenedetti and BDT are the guarantors; they had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analyses.

Roles of the funding source

This study was funded by the Canadian Institutes of Health Research (CIHR, KRS-144045 & PCG 155468). Dr. Wu was supported by an Utting Postdoctoral Fellowship from the Jewish General Hospital, Montreal, Quebec, Canada. Ms. Levis was supported by a CIHR Frederick Banting and Charles Best Canada Graduate Scholarship doctoral award. Ms. Rice was supported by a Vanier Canada Graduate Scholarship. Mr. Bhandari was supported by a studentship from the Research Institute of the McGill University Health Centre. Dr. Patten was supported by a Senior Health Scholar award from Alberta Innovates, Health Solutions. The primary study by Scott et al. was

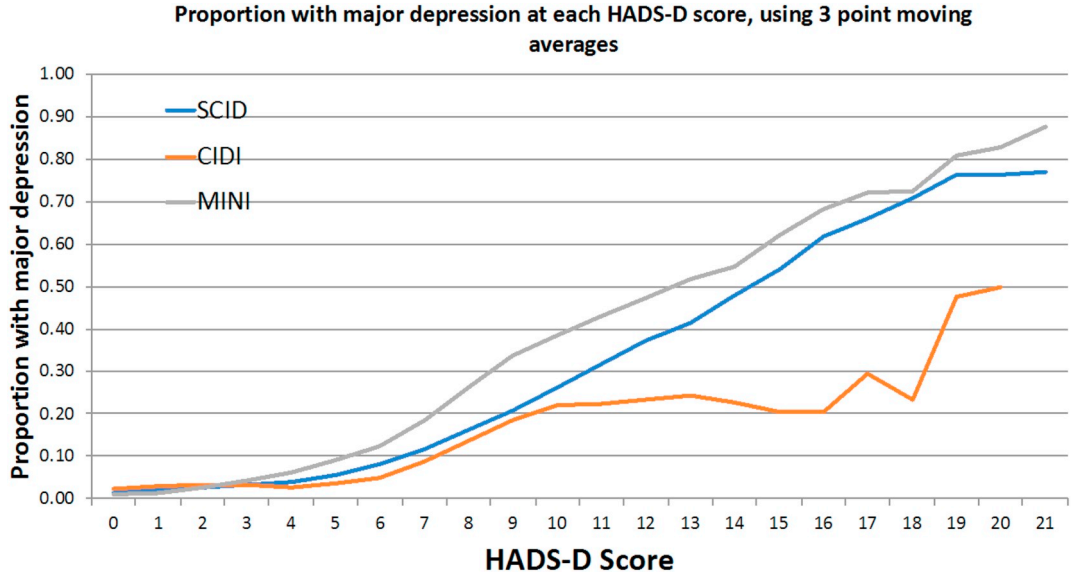


Fig. 2. Probability of major depression classification by HADS-D score for the SCID, CIDI, and MINI.
Abbreviations: CIDI: Composite International Diagnostic Interview; HADS-D: Depression subscale of Hospital Anxiety and Depression Scale; MINI: Mini International Neuropsychiatric Interview; SCID: Structured Clinical Interview for DSM Disorders.

supported by the Cumming School of Medicine and Alberta Health Services through the Calgary Health Trust, and funding from the Hotchkiss Brain Institute. The primary study by Amoozegar et al. was supported by the Alberta Health Services, the University of Calgary Faculty of Medicine, and the Hotchkiss Brain Institute. The primary study by Butnoriene et al. was supported by a grant from the Research Concil of Lithuania (LIG-03/2011). Dr. Jurate Butnoriene, PhD, who did the data collection and analysis as part of her PhD thesis for the primary study by Butnoriene et al., passed away and was unable to participate in this project. Dr. Robertas Bunevicius, MD, PhD (1958–2016) was the Principal Investigator of the primary studies by Butnoriene et al. and Bunevicius et al., but passed away and was unable to participate in this project. The primary study by Chen et al. was supported by the National Science Council, Taiwan (NSC 96-2314-B-182A-090-MY2). The primary study by Cheung et al. was supported by the Waikato Clinical School, University of Auckland, the Waikato Medical Research Foundation and the Waikato Respiratory Research Fund. The primary study by Cukor et al. was supported in part by a Promoting Psychological Research and Training on Health-Disparities Issues at Ethnic Minority Serving Institutions Grants (ProDIGs) awarded to Dr. Cukor from the American Psychological Association. The primary study by De la Torre et al. was supported by a Research Grant "Ramón Carrillo-Arturo Oñativa for Multicentric Studies" (2015) from the commission "Salud Investiga" of the Ministry of Health and Social Action of Argentina (Grant n° 1853). The primary study by Douven was supported by Maastricht University, Health Foundation Limburg, and the Adriana van Rinsum-Ponsen Stichting. The primary study by Honarmand et al. was supported by a grant from the Multiple Sclerosis Society of Canada. The primary study by Fischer et al. was supported as part of the RECODEHF study by the German Federal Ministry of Education and Research (01GY1150). The primary study by Gagnon et al. was supported by the Department of Psychiatry, University Health Network. The primary study by Akechi et al. was supported in part by a Grant-in-Aid for Cancer Research (11-2) from the Japanese Ministry of Health, Labour and Welfare and a Grant-in-Aid for Young Scientists (B) from the Japanese Ministry of Education, Culture, Sports, Science and Technology. The primary study by Kugaya et al. was supported in part by a Grant-in-Aid for Cancer Research (9–31) and the Second-Term Comprehensive 10-year Strategy for Cancer Control from the Japanese Ministry of Health, Labour and Welfare. The primary study Ryan et al. was supported by the Irish Cancer Society (Grant CRP08GAL). The primary study by Grassi et al. was supported by the European Commission DG Health and Consumer Protection (Agreement with the University of Ferrara — SI2.307317 2000CVGG2–026), the University of Ferrara, and the Fondazione Cassa di Risparmio di Ferrara. The primary study by Härter et al. was supported by the Federal Ministry of Education and Research, the Federation of German Pension Insurance Institutes, and the Freiburg/Bad Saeckingen Rehabilitation Research Network (Grant 01 GD 9802/4). The primary study by Keller et al. was supported by the Medical Faculty of the University of Heidelberg (grant no. 175/2000). The primary study by Jang et al. was supported by a grant from the Korea Health 21 R&D, Ministry of Health and Welfare, Republic of Korea. The primary study by Kang et al. was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (2009-0087344), and was supported by a Grant of the Korea Health 21 R&D, Ministry of Health and Welfare, Republic of Korea (A102065). The primary study by Löwe et al. was supported by the medical faculty of the University of Heidelberg, Germany (Project 121/2000). The primary study by Navines et al. was supported in part by grants from the Instituto de Salud Carlos III (EO PI08/90869) and (PSIGEN-VHC Study: FIS-E08/00268). The primary study by Massardo et al. was supported by Comisión Nacional de Investigación Científica y Tecnológica (CONICYT) grant # PFB12/2007 and Fondo Nacional de Desarrolo Científico y Tecnológico (FONDECYT; grant # 1110849). The primary study by Matsuoka et al. was supported by the Japanese Ministry of Health, Labour and Welfare through Research on Psychiatric and Neurological Disease and Mental Health (16190501, 19230701 and 20300701). The primary study by Hartung et al. was supported by the German Cancer Aid within the psychosocial oncology funding priority program (grant number 107465). The primary study by Consoli et al. was supported by grants from the French Society of Dermatology and the University Hospital of Saint Etienne. Dr. O'Donnell was supported by grants from NHMRC Program (1073041). The primary study by McFarlane et al. was supported by an Australian Government National Health and Medical Research Council program grant. The primary study by Sanchez-Gistau et al. was supported by a grant from the Ministry of Health of Spain (PI040418) and in part by Catalonia Government, DURSI 2009SGR1119. The primary study by Gould et al. was supported by the Transport Accident Commission Grant. The primary study by Lees et al. was supported by a 'start-up' research grant from the British Geriatric Society, Scotland. The primary study by Reme et al. was supported by the Research Council of Norway. The primary study by Rooney et al. was supported by the NHS Lothian Neuro-Oncology Endowment Fund. The primary study by Schwarzbold et al. was supported by PRONEX Program (NENASC Project) and PPSUS Program of Fundaçao de Amparo a esquisa e Inovacao do Estado de Santa Catarina (FAPESC) and the National Science and Technology Institute for Translational Medicine (INCT-TM). The primary study by Azah et al. was supported by Universiti Sains Malaysia. The primary study by Patel et al. was supported by the University of Sydney Cancer Research Fund. The primary study by Simard et al. was supported by IDEA grants from the Canadian Prostate Cancer Research Initiative and the Canadian Breast Cancer Research Alliance, as well as a studentship from the Canadian Institutes of Health Research. The primary study by Singer et al. was supported by a grant from the German Federal Ministry for Education and Research (no. 01ZZ0106). The primary study by Singer et al. was supported by grants from the German Federal Ministry for Education and Research (# 7DZAIQTX) and of the University of Leipzig (# formel. 1-57). The primary study by Meyer et al. was supported by the Federal Ministry of Education and Research (BMBF). The primary study by Stafford et al. was supported in part by seed funding from the Western and Central Melbourne Integrated Cancer Service. The primary study by Stafford et al. was supported by the University of Melbourne. The primary study by Stone et al. was supported by the Medical Research Council, UK and Chest Heart and Stroke, Scotland. The primary study by de Oliveira et al. was supported by CNPq and Fapemig, Brazil. The primary study by Pedroso et al. was supported by FAPEMIG (APq-03539-13). The primary study by Pedroso et al. was supported by Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Fapemig) (APq-03539-13). The primary study by Tiringer et al. was supported by the Hungarian Research Council (ETT 395). The primary study by Turner et al. was supported by a bequest from Jennie Thomas through Hunter Medical Research Institute. The primary study by Walterfang et al. was supported by Melbourne Health. Drs. Benedetti and Thombs were supported by FRQS researcher salary awards.

Declaration of competing interest

All authors have completed the Unified Competing Interest form at http://www.icmje.org/coi_disclosure.pdf and declare that: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous 3 years with the following exceptions: (1) Dr. Patten declares that he has received a grant, from the University of Calgary Hotchkiss Brain Institute, which was jointly funded by the Institute and Pfizer, outside the submitted work. (2) Dr. Ismail declares that he has received personal fees from Avanir, Janssen, Lundbeck, Otsuka, Sunovion, outside the submitted work. (3) Dr. Tonelli declares that he has received a grant from Merck Canada, outside the submitted work. (4) Dr. Feinstein reports that he received speaker's honorariums

from Biogen, Sanofi-Genzyme, Merck-Serono, Novartis, Roche, and is on the advisory board for Akili Interactive, outside the submitted work; He has also received royalties from the Cambridge University Press for the Clinical Neuropsychiatry of Multiple Sclerosis, 2nd Edition. (5) Dr. Jetté declares that she has received grants, from University of Calgary Hotchkiss Brain Institute, which was partly funded by Mathison Health Centre and Pfizer, outside the submitted work. (6) Dr. Löwe declares that the primary study by Löwe et al. was supported by unrestricted educational grants from Pfizer, Germany. (7) Dr. Matsuoka declares that he has received personal fees from Mochida, Pfizer, Eli Lilly, Morinaga Milk, and NTT Data, outside the submitted work. (8) Dr. Stone declares that he has received personal fees from UptoDate, outside the submitted work. (9) Dr. Sultan declares funding from Sanofi-Aventis Corporation, during conduct of the primary study.

Acknowledgement

We thank Dr. Linda Kwakkenbos for providing assistance with translation.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychores.2019.109892.

References

[1] M.B. First, Structured Clinical Interview for the DSM (SCID), John Wiley & Sons, Inc, New York, NY, 1995.
[2] T.S. Brugha, P.E. Bebbington, R. Jenkins, A difference that matters: comparisons of structured and semi-structured psychiatric diagnostic interviews in the general population, Psychol. Med. 29 (1999) 1013–1020.
[3] T.S. Brugha, R. Jenkins, N. Taub, H. Meltzer, P.E. Bebbington, A general population comparison of the Composite International Diagnostic Interview (CIDI) and the Schedules for Clinical Assessment in Neuropsychiatry (SCAN), Psychol. Med. 31 (2001) 1001–1013.
[4] E. Nosen, S.R. Woody, Diagnostic assessment in research, in: D. McKay (Ed.), Handbook of Research Methods in Abnormal and Clinical Psychology, Sage, Thousand Oaks, CA, 2008, pp. 109–124.
[5] L.N. Robins, J. Wing, H.U. Wittchen, J.E. Helzer, T.F. Babor, J. Burke, et al., The Composite International Diagnostic Interview: an epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures, Arch. Gen. Psychiatry 45 (1988) 1069–1077.
[6] Y. Lecrubier, D.V. Sheehan, E. Weiller, P. Amorim, I. Bonora, K.H. Sheehan, et al., The Mini International Neuropsychiatric Interview (MINI). A short diagnostic structured interview: reliability and validity according to the CIDI, Eur. Psychiatry 12 (1997) 224–231.
[7] D.V. Sheehan, Y. Lecrubier, K.H. Sheehan, J. Janvas, E. Weiller, A. Keskiner, et al., The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability, Eur. Psychiatry 12 (1997) 232–241.
[8] D.B. Rice, L.A. Kloda, I. Shrier, B.D. Thombs, Reporting completeness and transparency of meta-analyses of depression screening tool accuracy: a comparison of meta-analyses published before and after the PRISMA statement, J. Psychosom. Res. 87 (2016) 57–69.
[9] J.C. Anthony, M. Folstein, A.J. Romanoski, et al., Comparison of the lay Diagnostic Interview Schedule and a standardized psychiatric diagnosis: experience in eastern Baltimore, Arch. Gen. Psychiatry 42 (1985) 667–675.
[10] B.M. Booth, J.A. Kirchner, G. Hamiltonc, R. Harrell, G.R. Smith, Diagnosing depression in the medically ill: validity of a lay-administered structured diagnostic interview, J. Psychiatr. Res. 32 (1998) 353–360.
[11] V. Hesselbrock, J. Stabenau, M. Hesselbrock, P. Mirkin, R. Meyer, A comparison of two interview schedules: the Schedule for Affective Disorders and Schizophrenia-Lifetime and the National Institute for Mental Health Diagnostic Interview Schedule, Arch. Gen. Psychiatry 39 (1982) 674–677.
[12] V. Jordanova, C. Wickramesinghe, C. Gerada, M. Prince, Validation of two survey diagnostic interviews among primary care attendees: a comparison of CIS-R and CIDI with SCAN ICD-10 diagnostic categories, Psychol. Med. 34 (2004) 1013–1024.
[13] B. Levis, A. Benedetti, K.E. Riehm, N. Saadat, A.W. Levis, M. Azar, et al., Probability of major depression diagnostic classification using semi-structured versus fully structured diagnostic interviews, Br. J. Psychiatry 212 (2018) 377–385.
[14] B. Levis, A. Benedetti, D. McMillan, et al., Comparison of major depression diagnostic classification probability using the SCID, CIDI and MINI diagnostic interviews among women in pregnancy or postpartum: an individual participant data meta-analysis, Int. J. Methods Psychiatr. Res. (2019), https://doi.org/10.1002/mpr.1803 [Epub ahead of print].
[15] A.S. Zigmond, R.P. Snaith, The hospital anxiety and depression scale, Acta Psychiatr. Scand. 67 (1983) 361–370.
[16] B.D. Thombs, A. Benedetti, L.A. Kloda, B. Levis, M. Azar, K.E. Riehm, et al., Diagnostic accuracy of the Depression subscale of the Hospital Anxiety and Depression Scale (HADS-D) for detecting major depression: protocol for a systematic review and individual patient data meta-analyses, BMJ Open 6 (2016) e011913.
[17] M.D. McInnes, D. Moher, B.D. Thombs, T.A. McGrath, P.M. Bossuyt, T. Clifford, et al., Preferred reporting items for a systematic review and meta-analysis of diagnostic test accuracy studies: the PRISMA-DTA statement, JAMA 319 (2018) 388–396.
[18] L.A. Stewart, M. Clarke, M. Rovers, R.D. Riley, M. Simmonds, G. Stewart, et al., PRISMA-IPD development group: preferred reporting items for systematic review and meta-analyses of individual participant data: the PRISMA-IPD statement, JAMA 313 (2015) 1657–1665.
[19] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, Third ed. (Revised), (1987) Washington, DC.
[20] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, Fourth ed., (1994) Washington, DC.
[21] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, Fourth ed. (Text Revised), (2000) Washington, DC.
[22] American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders, Fifth ed., (2013) Washington, DC.
[23] World Health Organization, The ICD-10 Classification of Mental and Behavioural Disorders: Clinical Descriptions and Diagnostic Guidelines, WHO, Geneva, Switzerland, 1992.
[24] J. McGowan, M. Sampson, D.M. Salzwedel, E. Cogo, V. Foerster, C. Lefebvre, PRESS peer review of electronic search strategies: 2015 guideline statement, J. Clin. Epidemiol. 75 (2016) 40–46.
[25] United Nations, International Human Development Indicators, http://hdr.undp.org/en/countries, (2019) accessed 16 March 2019.
[26] R. Core Team, R: A Language and Environment for Statistical Computing, R Foundation for Statistical Computing, Vienna, Austria, 2018.
[27] RStudio Team, RStudio: Integrated development for R. RStudio, Inc. (2015) Boston, MA.
[28] D. Bates, M. Machler, B. Bolker, S. Walker, Fitting linear mixed-effects models using lme4, J. Stat. Softw. 67 (2016) 1–48.