Supplementary Online Content

Rotenstein LS, Ramos MA, Torre M, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. *JAMA*. doi:10.1001/jama.2016.17324

This supplementary material has been provided by the authors to give readers additional information about their work.

eMethods 1. Search strategy used in the current systematic review and meta-analysis.

Depression

1. Depress*
2. Depressed
3. Depression
4. Depression [MeSH]
5. Depressive disorder [MeSH]
6. Depressive disorder, major [MeSH]
7. Ideation
8. Major depression
9. Major depressive disorder
10. MDD
11. Sadness
12. Suicid*
13. Suicide [MeSH]
14. OR / 1 – 13

Medical students

15. Clinical student*
16. Education, medical [MeSH]
17. Education, medical, undergraduate [MeSH]
18. Med student*
19. Medical student*
20. Medical trainee*
21. Preclinical student*
22. Student doctor*
23. Student physician*
24. Undergraduate medic*
25. OR / 15 – 24

Study design

26. Cohort design
27. Cohort stud*
28. Cohort studies [MeSH]
29. Cross-sectional analysis
30. Cross-sectional design
31. Cross-sectional stud*
32. Cross-sectional studies [MeSH]
33. Epidemiologic stud*
34. Epidemiologic studies [MeSH]
35. Incidence
36. Longitudinal design
37. Longitudinal stud*
38. Meta-analy*
39. Meta-analysis [Publication Type]
40. Observational stud*
41. Population stud*
42. Prevalence
43. Prospective design
44. Prospective stud*
45. Prospective studies [MeSH]
46. Retrospective design
47. Retrospective stud*
48. Retrospective studies [MeSH]
49. Review
50. Review [Publication Type]
51. OR / 26 – 51

Combined search: #14 AND #25 AND #51

Legend: MeSH indicates Medical Subject Heading in MEDLINE

eMethods 2. Modified Newcastle-Ottawa risk of bias scoring guide.

(**1) Sample representativeness:**

1 point: Population contained multiple class years at multiple schools.
0 points: Population contained either a single class year, a single school, or both.

(2) Sample size:

1 point: Sample size was greater than or equal to 200 participants.
0 points: Sample size was less than 200 participants.

(3) Non-respondents:

1 point: Comparability between respondent and non-respondent characteristics was established with a satisfactory response rate.
0 points: The comparability between respondents and non-respondents was unsatisfactory, the response rate was unsatisfactory, or there was no description of the response rate or the characteristics of the responders or non-responders.

(4) Ascertainment of depression or depressive symptoms and suicidal ideation:

1 point: The study employed a commonly used measurement tool with a valid cutoff score (*e.g.*, BDI ≥10, BDI-II ≥14, CES-D ≥16, HADS-D ≥8, PHQ-9 ≥10, Zung-SDS ≥50).
0 points: The study employed an infrequently used measurement tool, a commonly used measurement tool with an invalid cutoff score, or any tool with published sensitivity/specificity values <70% (*e.g.*, the PRIME-MD screening instrument).

(5) Quality of descriptive statistics reporting:

1 point: The study reported descriptive statistics to describe the population (*e.g.*, age, sex, class year) with proper measures of dispersion (*e.g.*, mean, standard deviation).
0 points: The study did not report descriptive statistics, incompletely reported descriptive statistics, or did not report measures of dispersion.

Legend: The individual components listed above are summed to generate a total modified Newcastle-Ottawa risk of bias score for each study. Total scores range from 0 to 5. Figure 5 of the manuscript groups studies by the above-mentioned individual components as well as by total score. For the total score grouping, studies were judged to be of low risk of bias (≥3 points) or high risk of bias (<3 points).

eTable 1. Summary characteristics of the studies included in this systematic review and meta-analysis. (Pages 2-4)

		n	%
Study Design			
	Cross-sectional	179	91.8%
	Longitudinal	16	8.2%
Level of Training			
	Both	117	60.0%
	Clinical	19	9.7%
	Not reported	13	6.7%
	Preclinical	46	23.6%
Continent or Region			
	Africa	9	4.6%
	Asia	56	28.7%
	Eurasia	11	5.6%
	Europe	28	14.4%
	Middle East	21	10.8%
	North America	49	25.1%
	Oceania	3	1.5%
	South America	18	9.2%
Country			
	Australia	1	0.5%
	Brazil	13	6.7%
	Canada	2	1.0%
	Chile	1	0.5%
	China	11	5.6%
	Colombia	1	0.5%
	Dubai	1	0.5%
	Egypt	5	2.6%
	Estonia	1	0.5%
	Ethiopia	1	0.5%
	France	1	0.5%
	Germany	6	3.1%
	Greece	1	0.5%
	Hong Kong	2	1.0%
	India	8	4.1%

	Iran	5	2.6%
	Iraq	1	0.5%
	Israel	3	1.5%
	Korea	1	0.5%
	Lebanon	2	1.0%
	Lithuania	1	0.5%
	Macedonia	1	0.5%
	Malaysia	7	3.6%
	Mexico	4	2.1%
	Multiple Countries	3	1.5%
	Nepal	3	1.5%
	Netherlands	1	0.5%
	New Zealand	2	1.0%
	Nigeria	2	1.0%
	Norway	1	0.5%
	Pakistan	15	7.7%
	Panama	1	0.5%
	Peru	2	1.0%
	Poland	2	1.0%
	Saudi Arabia	8	4.1%
	Serbia	2	1.0%
	South Africa	1	0.5%
	South Korea	4	2.1%
	Sweden	3	1.5%
	Thailand	3	1.5%
	Trinidad and Tobago	1	0.5%
	Turkey	10	5.1%
	United Arab Emirates	1	0.5%
	United Kingdom	7	3.6%
	United States	42	21.5 %
	Vietnam	1	0.5%
Depression Screening Instrument			
	Aga Khan University Anxiety and Depression Scale (AKUADS)	5	2.7%
	Beck Depression Inventory (BDI)	46	25.1 %
	Beck Depression Inventory-II (BDI-II)	9	4.9%
	Beck Depression Inventory-Short Form (BDI-SF)	2	1.1%
	Brief Symptom Inventory-Depression (BSI-DEP)	1	0.5%
	Center for Epidemiological Studies Depression (CES-D)	16	8.7%
	Depression Anxiety Stress Scale-21 (DASS-21)	7	3.8%
	Depression Anxiety Stress Scale-42 (DASS-42)	3	1.6%
	Derogatis Stress Profile (DSP)	1	0.5%

	Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) Criteria A and C	1	0.5%
	Emotional State Questionnaire (EST-Q)	1	0.5%
	General Depression Scale Short Form (ADS-K)	1	0.5%
	General Health Questionnaire-12 (GHQ-12)	8	4.4%
	General Health Questionnaire-28 (GHQ-28)	3	1.6%
	Health-Related Self-Reported Scale (HRSRS)	1	0.5%
	Hospital Anxiety and Depression Scale (HADS-D)	19	10.4 %
	Kessler Psychological Distress Scale (K-10)	2	1.1%
	Kutcher Adolescent Depression Scale (KADS)	1	0.5%
	Major Depression Inventory (MDI)	1	0.5%
	Mini International Neuropsychiatric Interview (MINI)	1	0.5%
	Minnesota Multiphasic Personality Inventory-Depression Scale (MMPI-D)	1	0.5%
	Patient Health Questionnaire-9 (PHQ-9)	19	10.4 %
	Patient-Reported Outcomes Measurement Information System (PROMIS-T)	1	0.5%
	Primary Care Evaluation of Mental Disorders (PRIME-MD)	14	7.7%
	Quick Inventory of Depressive Symptomatology (QIDS)	1	0.5%
	Symptom Checklist 90 (SCL-90)	1	0.5%
	Thai Depression Inventory (TDI)	1	0.5%
	Zung Self-Rating Depression Scale (Zung-SDS)	15	8.2%
	Zung Self-Rating Depression Scale-Short Form (Zung-SF)	1	0.5%
Suicide Screening Instrument			
	Beck Scale for Suicidal Ideation (BSI)	2	8.3%
	Mini International Neuropsychiatric Interview (MINI)	1	4.2%
	Suicidal Behaviours Questionnaire-Revised (SBQ-R)	1	4.2%
	Suicidal ideation over past 1 month	1	4.2%
	Suicidal ideation over past 12 months	7	29.2 %
	Suicidal ideation over past 12 months (GHQ-28)	3	12.5 %
	Suicidal ideation over past 12 months (Meehan)	4	16.7 %
	Suicidal ideation over past 12 months (Paykel)	1	4.2%
	Suicidal ideation over past 2 weeks (PHQ)	2	8.3%
	Suicidal ideation over past 2 weeks (PRIME-MD)	2	8.3%
Total Newcastle-Ottawa Score			
	0	14	7.2%
	1	50	25.6 %
	2	79	40.5

			%
	3	38	19.5 %
	4	12	6.2%
	5	2	1.0%

eTable 2. Newcastle-Ottawa risk of bias scores for the 195 studies included in this systematic review and meta-analysis. (Pages 5-9)

First author, year	Representative-ness	Sample Size	Non-respondents	Ascertainment of Depression	Descriptive Statistics	Total
Abdel Wahed WY, 2016[1]	0	1	0	0	1	2
Adamiak G, 2004[2]	0	1	0	0	0	1
Aghakhani N, 2011[3]	0	1	0	1	1	3
Ahmed I, 2009[4]	0	0	0	1	0	1
Ahmed SA, 2016[5]	1	1	0	1	1	4
Akbari V, 2014[6]	0	0	0	0	0	0
Aktekin M, 2001[7]	0	0	0	0	0	0
Akvardar Y, 2003[8]	1	1	0	0	1	3
Akvardar Y, 2004[9]	0	0	0	0	0	0
Al Faris EA, 2012[10]	0	1	0	1	1	3
Alem A, 2005[11]	0	1	0	1	0	2
Alexandrino-Silva C, 2009[12]	0	1	0	0	1	2
AlFaris EA, 2014[13]	0	1	0	1	0	2
Ali FA, 2015[14]	0	0	0	0	0	0
Alvi T, 2010[15]	0	1	0	1	1	3
Amaral GF, 2008[16]	0	1	0	1	0	2
Amir M, 2010[17]	0	1	0	1	1	3
Amiri L, 2012[18]	0	0	0	1	1	2
Angkurawaranon C, 2016[19]	0	1	0	0	1	2
Aniebue PN, 2008[20]	0	1	0	1	1	3
Ashor AW, 2012[21]	0	1	0	1	0	2
Ashton CH, 1995[22]	0	1	0	1	1	3
Aziz NAHA, 2011[23]	0	1	0	0	1	2
Bahri Y, 2011[24]	0	0	0	0	0	0
Baldassin S, 2008[25]	0	1	1	1	1	4
Basnet B, 2012[26]	0	0	0	1	1	2
Bassols AM, 2014[27]	0	1	0	0	1	2
Bayati A, 2009[28]	0	0	0	0	1	1
Baykan Z, 2012[29]	0	0	0	0	1	1
Berner JE, 2014[30]	0	1	0	0	1	2
Bore M, 2016[31]	0	0	0	0	1	1
Borst JM, 2015[32]	1	1	0	0	1	3
Bunevicius A, 2008[33]	0	1	0	1	1	3
Camp DL, 1994[34]	0	1	0	1	0	2
Carter FA, 2014[35]	0	0	0	0	1	1

Castaldelli-Maia JM, 2012[36]	0	1	0	0	0	1
Chan DW, 1991[37]	0	1	1	1	1	4
Chan DW, 1992[38]	0	0	1	0	0	1
Chandavarkar U, 2007[39]	1	1	0	0	0	2
Chang E, 2012[40]	0	1	0	0	0	1
Chen JQ, 2004[41]	0	1	0	1	1	3
Choi J, 2015[42]	0	1	0	0	0	1
Clark DC, 1988[43]	0	0	0	0	1	1
Costa EF, 2012[44]	0	0	0	1	0	1
Dahlin M, 2005[45]	0	1	1	0	0	2
Dahlin M, 2011[46]	0	1	0	0	0	1
David MA, 2013[47]	0	0	0	0	0	0
de Melo Cavestro J, 2006[48]	0	1	0	1	1	3
de Oliveira e Sousa Leão PB, 2011[49]	0	0	0	0	1	1
De Sousa Lima L, 2010[50]	0	0	0	1	0	1
Del Ben CM, 2013[51]	0	0	0	1	1	2
Dyrbye LN, 2006[52]	1	1	0	0	0	2
Dyrbye LN, 2007[53]	1	1	0	0	0	2
Dyrbye LN, 2008[54]	1	1	0	0	0	2
Dyrbye LN, 2010[55]	1	1	0	0	0	2
Dyrbye LN, 2011[56]	1	1	0	0	0	2
Dyrbye LN, 2014[57]	1	1	0	0	0	2
Dyrbye LN, 2015[58]	1	1	0	0	0	2
El-Gilany AH, 2008[59]	1	1	0	0	1	3
Eller T, 2006[60]	0	1	0	0	1	2
Eskin M, 2011[61]	1	1	0	1	1	4
Farahangiz S, 2016[62]	0	1	0	0	1	2
Ghodasara SL, 2011[63]	0	1	0	1	0	2
Givens JL, 2002[64]	0	0	1	0	0	1
Goebert D, 2009[65]	1	1	0	1	0	3
Gold JA, 2015[66]	0	0	0	0	0	0
Guerrero Lopez JB, 2013[67]	0	1	0	1	1	3
Gulec M, 2005[68]	0	1	0	0	1	2
Gupta S, 2013[69]	0	0	0	1	0	1
Guthrie E, 1998[70]	0	0	1	0	0	1
Haglund ME, 2009[71]	0	0	0	1	1	2
Hardeman RR, 2015[72]	0	1	0	0	0	1
Helmers KF, 1997[73]	0	1	0	0	1	2
Hendryx MS, 1991[74]	0	0	0	1	1	2

Herzog DB, 1987[75]	0	1	1	1	0	3
Hirata FC, 2007[76]	0	0	0	0	1	1
Honney K, 2010[77]	0	1	0	1	1	3
Ibrahim MB, 2015[78]	0	0	0	0	0	0
Ibrahim N, 2013[79]	0	1	0	0	1	2
Ibrahim NK, 2013[80]	0	1	0	0	1	2
Imran N, 2016[81]	0	1	0	0	1	2
Inam SB, 2007[82]	0	1	0	0	0	1
Inam SN, 2003[83]	0	0	0	0	0	0
Iqbal S, 2015[84]	0	1	0	0	1	2
Jackson ER, 2016[85]	1	1	0	0	0	2
Jadoon NA, 2010[86]	0	1	0	0	1	2
James D, 2013[87]	0	1	1	0	0	2
Jeong Y, 2010[88]	0	0	1	1	0	2
Jurkat HB, 2011[89]	0	1	1	0	0	2
Karaoglu N, 2011[90]	0	1	0	1	1	3
Kaya M, 2007[91]	0	1	0	0	0	1
Khan MA, 2015[92]	0	0	0	1	0	1
Khan MS, 2006[93]	0	0	0	0	1	1
Khokher S, 2005[94]	0	1	0	1	0	2
Kim B, 2014[95]	0	0	0	1	0	1
Kohls N, 2012[96]	1	1	0	0	0	2
Kongsomboon K, 2010[97]	0	1	0	0	0	1
Kotter T, 2014[98]	0	1	0	1	1	3
Kulsoom B, 2015[99]	0	1	0	0	0	1
Kumar GS, 2012[100]	0	1	0	1	0	2
Lapinski J, 2016[101]	1	1	0	0	0	2
Levine RE, 2006[102]	0	1	0	0	0	1
Liao Y, 2010[103]	0	1	0	1	1	3
Ludwig AB, 2015[104]	0	1	1	0	0	2
Lupo 2011[105]	0	0	0	0	1	1
MacLean L, 2015[106]	0	1	0	0	0	1
Manaf NA, 2016[107]	0	1	0	0	1	2
Mancevska S, 2008[108]	0	1	0	0	1	2
Marakoğlu K, 2006[109]	0	1	0	1	1	3
Marwat MA, 2013[110]	0	0	0	1	0	1
Matheson KM, 2016[111]	0	1	0	0	0	1
Mayda AT, 2010[112]	0	1	0	0	1	2
Mehanna Z, 2006[113]	0	1	0	0	0	1
Melo-Carrillo A, 2012[114]	0	1	0	1	0	2
Menezes RG, 2012[115]	0	1	0	1	1	3
Miletic V, 2015[116]	0	1	0	1	1	3
Mojs EH, 2015[117]	1	1	0	0	0	2

Mosley TH, 1994[118]	0	0	0	1	0	1
Mousa OY, 2016[119]	0	1	0	0	0	1
Naja WJ, 2016[120]	0	1	0	1	0	2
Nasioudis, D, 2015[121]	0	0	0	0	1	1
Nava FR, 2013[122]	0	1	0	1	0	2
Newbury-Birch D, 2001[123]	0	0	0	1	0	1
Okasha A, 1981[124]	0	1	0	1	0	2
Oku A, 2015[125]	0	1	0	0	1	2
Osama M, 2014[126]	1	1	1	1	1	5
Pan XF, 2015[127]	1	1	0	0	1	3
Paro HB, 2010[128]	0	1	0	0	1	2
Peleg-Sagy T, 2012[129]	0	0	0	1	1	2
Peleg-Sagy T, 2013[130]	1	0	0	1	1	3
Pereyra-Elías R, 2010[131]	0	1	0	0	1	2
Perveen S, 2016[132]	1	1	0	0	0	2
Phillips LC, 2006[133]	0	0	1	1	0	2
Pickard M, 2000[134]	0	0	0	1	0	1
Pillay N, 2016[135]	0	1	0	0	0	1
Pinzón-Amado A, 2013[136]	1	1	0	1	1	4
Prinz P, 2012[137]	0	0	0	0	0	0
Quince TA, 2012[138]	0	1	0	1	0	2
Rab F, 2008[139]	0	0	0	1	1	2
Ristic-Ignjatovic D, 2013[140]	0	1	0	1	1	3
Rizvi F, 2015[141]	1	0	0	0	1	2
Roh MS, 2009[142]	1	1	0	0	0	2
Romo-Nava F, 2016[143]	0	1	0	1	1	3
Rosal MC, 1997[144]	0	0	0	0	0	0
Saeed AA, 2016[145]	0	0	0	0	1	1
Samaranayake CB, 2011[146]	0	1	0	1	0	2
Saravanan C, 2014[147]	0	1	0	0	0	1
Schwenk TL, 2010[148]	0	1	0	1	0	2
Serra RD, 2015[149]	0	1	0	1	0	2
Seweryn M, 2015[150]	1	1	0	1	0	3
Shah AA, 2009[151]	1	1	0	0	1	3
Shariatpanaahi MV, 2007[152]	0	0	0	1	1	2
Shen L, 2009[153]	0	1	0	0	0	1
Sherina MS, 2004[154]	0	1	1	0	1	3
Shi M, 2015[155]	1	1	0	1	1	4

Shi M, 2016[156]	1	1	0	1	1	4
Shindel AW, 2011[157]	1	1	0	1	1	4
Sidana S, 2012[158]	0	1	0	1	0	2
Smith CK, 2007[159]	0	1	0	1	1	3
Smith JF, 2010[160]	1	1	0	1	1	4
Smith JF, 2011[161]	1	1	0	1	0	3
Sobowale K, 2014[162]	0	1	1	1	0	3
Sreeramareddy CT, 2007[163]	0	1	0	0	1	2
Sun L, 2011[164]	1	1	0	1	1	4
Supe AN, 1998[165]	0	1	0	0	0	1
Tang QS, 2005[166]	0	0	0	1	0	1
Thomas MR, 2006[167]	1	1	0	0	0	2
Thompson D, 2010[168]	0	0	0	1	0	1
Thompson G, 2016[169]	0	0	0	1	0	1
Tin TS, 2015[170]	0	1	0	1	0	2
Tjia J, 2005[171]	0	1	0	0	1	2
Tran QA, 2015[172]	1	1	1	1	0	4
Tyssen R, 2001[173]	0	1	0	1	1	3
Valle R, 2013[174]	0	1	0	1	1	3
Vankar JR, 2014[175]	0	1	0	1	0	2
Vaysse B, 2014[176]	0	0	1	1	1	3
Vitaliano PP, 1988[177]	0	1	0	0	1	2
Voltmer E, 2012[178]	0	0	0	0	1	1
Walkiewicz M, 2012[179]	0	0	0	0	0	0
Wallin U, 2003[180]	0	1	0	1	0	2
Wan YH, 2012[181]	1	1	1	1	1	5
Waqas A, 2015[182]	1	1	0	1	1	4
Wege N, 2016[183]	0	1	1	0	1	3
Wimsatt LA, 2015[184]	0	1	0	1	0	2
Wolf MR, 2016[185]	0	0	0	0	0	0
Wongpakaran N, 2010[186]	0	1	0	0	1	2
Yang F, 2014[187]	0	1	0	0	0	1
Yilmaz Y, 2014[188]	0	1	0	1	1	3
Yoon S, 2014[189]	0	0	0	1	1	2
Youssef FF, 2016[190]	0	1	0	1	1	3
Yusoff MS, 2013[191]	0	0	0	0	0	0
Yusoff MS, 2013[192]	0	0	1	0	0	1
Zeldow PB, 1987[193]	0	0	0	1	0	1
Zoccolillo M, 1986[194]	0	1	0	1	0	2
Zulfikar Ali RV, 1994[195]	0	1	0	1	0	2

Legend: Studies are ordered alphabetically by first author. Full details regarding Newcastle-Ottawa risk of bias scoring are provided in eMethods 2.

eTable 3. Sensitivity analysis of the prevalence of depression or depressive symptoms among medical students. (Pages 10-16)

Study Omitted	Prevalence (%)	LCI	UCI	τ^2	I^2
Abdel Wahed WY, 2016[1]	27.1%	24.6%	29.7%	0.77	98.9%
Adamiak G, 2004[2]	27.3%	24.8%	29.9%	0.78	98.9%
Aghakhani N, 2011[3]	27.1%	24.6%	29.8%	0.78	98.9%
Ahmed I, 2009[4]	27.2%	24.7%	29.9%	0.78	98.9%
Akbari V, 2014[6]	27.3%	24.8%	30.0%	0.77	98.9%
Aktekin M, 2001[7]	27.1%	24.6%	29.8%	0.78	98.9%
Akvardar Y, 2003[8]	27.2%	24.7%	29.9%	0.78	98.9%
Akvardar Y, 2004[9]	27.2%	24.7%	29.9%	0.78	98.9%
Al Faris EA, 2012[10]	27.1%	24.6%	29.8%	0.78	98.9%
Alexandrino-Silva C, 2009[12]	27.4%	24.9%	30.0%	0.77	98.9%
AlFaris EA, 2014[13]	27.1%	24.6%	29.7%	0.77	98.9%
Ali FA, 2015[14]	27.1%	24.6%	29.7%	0.77	98.9%
Alvi T, 2010[15]	27.2%	24.7%	29.9%	0.78	98.9%
Amaral GF, 2008[16]	27.2%	24.7%	29.9%	0.78	98.9%
Amir M, 2010[17]	27.2%	24.7%	29.9%	0.78	98.9%
Angkurawaranon C, 2016[19]	27.4%	24.9%	30.0%	0.77	98.9%
Aniebue PN, 2008[20]	27.3%	24.8%	29.9%	0.78	98.9%
Ashor AW, 2012[21]	27.3%	24.8%	30.0%	0.77	98.9%
Ashton CH, 1995[22]	27.2%	24.7%	29.8%	0.78	98.9%
Aziz NAHA, 2011[23]	27.2%	24.7%	29.8%	0.78	98.9%
Bahri Y, 2011[24]	27.3%	24.8%	29.9%	0.78	98.9%
Baldassin S, 2008[25]	27.2%	24.7%	29.8%	0.78	98.9%
Basnet B, 2012[26]	27.2%	24.7%	29.9%	0.78	98.9%
Bassols AM, 2014[27]	27.3%	24.8%	30.0%	0.78	98.9%
Bayati A, 2009[28]	27.1%	24.6%	29.8%	0.78	98.9%

Baykan Z, 2012[29]	27.2%	24.7%	29.9%	0.78	98.9%
Berner JE, 2014[30]	27.3%	24.8%	29.9%	0.78	98.9%
Bore M, 2016[31]	27.2%	24.7%	29.9%	0.78	98.9%
Borst JM, 2015[32]	27.2%	24.7%	29.9%	0.78	98.9%
Bunevicius A, 2008[33]	27.3%	24.8%	30.0%	0.77	98.9%
Camp DL, 1994[34]	27.3%	24.8%	30.0%	0.78	98.9%
Carter FA, 2014[35]	27.3%	24.8%	30.0%	0.77	98.9%
Castaldelli-Maia JM, 2012[36]	27.3%	24.8%	30.0%	0.77	98.9%
Chan DW, 1991[37]	27.1%	24.6%	29.8%	0.78	98.9%
Chan DW, 1992[38]	27.3%	24.8%	30.0%	0.78	98.9%
Chandavarkar U, 2007[39]	27.5%	24.9%	30.1%	0.77	98.9%
Chang E, 2012[40]	27.1%	24.6%	29.7%	0.77	98.9%
Choi J, 2015[42]	27.3%	24.8%	29.9%	0.78	98.9%
Clark DC, 1988[43]	27.2%	24.7%	29.8%	0.78	98.9%
Costa EF, 2012[44]	27.2%	24.7%	29.8%	0.78	98.9%
Dahlin M, 2005[45]	27.3%	24.8%	30.0%	0.77	98.9%
Dahlin M, 2011[46]	27.4%	24.9%	30.0%	0.77	98.9%
David MA, 2013[47]	27.3%	24.8%	30.0%	0.77	98.9%
de Melo Cavestro J, 2006[48]	27.4%	24.9%	30.0%	0.77	98.9%
de Oliveira e Sousa Leão PB, 2011[49]	27.3%	24.8%	29.9%	0.78	98.9%
De Sousa Lima L, 2010[50]	27.1%	24.6%	29.8%	0.78	98.9%
Del Ben CM, 2013[51]	27.3%	24.8%	30.0%	0.78	98.9%
Dyrbye LN, 2006[52]	27.1%	24.6%	29.8%	0.78	98.9%
Dyrbye LN, 2007[53]	27.1%	24.6%	29.8%	0.78	98.9%
Dyrbye LN, 2008[54]	27.1%	24.6%	29.8%	0.79	98.9%
Dyrbye LN, 2010[55]	27.1%	24.6%	29.8%	0.78	98.9%
Dyrbye LN, 2011[56]	27.2%	24.7%	29.9%	0.79	98.9%

Dyrbye LN, 2014[57]	27.1%	24.6%	29.7%	0.76	98.8%
Dyrbye LN, 2015[58]	27.2%	24.7%	29.9%	0.78	98.9%
El-Gilany AH, 2008[59]	27.3%	24.8%	29.9%	0.78	98.9%
Eller T, 2006[60]	27.2%	24.7%	29.9%	0.78	98.9%
Farahangiz S, 2016[62]	27.1%	24.6%	29.8%	0.78	98.9%
Ghodasara SL, 2011[63]	27.3%	24.8%	29.9%	0.78	98.9%
Givens JL, 2002[64]	27.3%	24.8%	29.9%	0.78	98.9%
Goebert D, 2009[65]	27.3%	24.8%	29.9%	0.78	98.9%
Gold JA, 2015[66]	27.5%	24.9%	30.1%	0.77	98.9%
Guerrero Lopez JB, 2013[67]	27.2%	24.7%	29.8%	0.78	98.9%
Gulec M, 2005[68]	27.2%	24.7%	29.9%	0.78	98.9%
Gupta S, 2013[69]	27.2%	24.7%	29.8%	0.78	98.9%
Guthrie E, 1998[70]	27.2%	24.7%	29.9%	0.78	98.9%
Haglund ME, 2009[71]	27.3%	24.8%	29.9%	0.78	98.9%
Hardeman RR, 2015[72]	27.4%	24.9%	30.0%	0.75	98.9%
Helmers KF, 1997[73]	27.1%	24.6%	29.7%	0.77	98.9%
Hendryx MS, 1991[74]	27.3%	24.8%	30.0%	0.78	98.9%
Herzog DB, 1987[75]	27.4%	24.9%	30.1%	0.77	98.9%
Hirata FC, 2007[76]	27.2%	24.7%	29.9%	0.78	98.9%
Honney K, 2010[77]	27.1%	24.6%	29.8%	0.78	98.9%
Ibrahim MB, 2015[78]	27.1%	24.6%	29.7%	0.78	98.9%
Ibrahim N, 2013[79]	27.3%	24.8%	30.0%	0.77	98.9%
Ibrahim NK, 2013[80]	27.3%	24.8%	30.0%	0.77	98.9%
Imran N, 2016[81]	27.1%	24.6%	29.8%	0.78	98.9%
Inam SB, 2007[82]	27.1%	24.6%	29.8%	0.78	98.9%
Inam SN, 2003[83]	27.1%	24.6%	29.7%	0.77	98.9%
Iqbal S, 2015[84]	27.1%	24.6%	29.8%	0.78	98.9%

Jackson ER, 2016[85]	27.1%	24.6%	29.7%	0.76	98.8%
Jadoon NA, 2010[86]	27.2%	24.6%	29.8%	0.78	98.9%
James D, 2013[87]	27.2%	24.7%	29.9%	0.78	98.9%
Jeong Y, 2010[88]	27.2%	24.7%	29.9%	0.78	98.9%
Jurkat HB, 2011[89]	27.3%	24.8%	30.0%	0.78	98.9%
Karaoglu N, 2011[90]	27.2%	24.7%	29.9%	0.78	98.9%
Kaya M, 2007[91]	27.3%	24.8%	29.9%	0.78	98.9%
Khan MA, 2015[92]	27.3%	24.8%	30.0%	0.78	98.9%
Khan MS, 2006[93]	27.0%	24.6%	29.7%	0.77	98.9%
Kim B, 2014[95]	27.2%	24.7%	29.9%	0.78	98.9%
Kohls N, 2012[96]	27.3%	24.7%	29.9%	0.78	98.9%
Kongsomboon K, 2010[97]	27.4%	24.9%	30.1%	0.77	98.9%
Kotter T, 2014[98]	27.5%	25.0%	30.1%	0.77	98.9%
Kulsoom B, 2015[99]	27.2%	24.7%	29.8%	0.78	98.9%
Kumar GS, 2012[100]	27.0%	24.6%	29.7%	0.77	98.9%
Lapinski J, 2016[101]	27.2%	24.6%	29.8%	0.79	98.9%
Levine RE, 2006[102]	27.3%	24.7%	29.9%	0.78	98.9%
Liao Y, 2010[103]	27.4%	24.9%	30.1%	0.77	98.9%
Ludwig AB, 2015[104]	27.2%	24.7%	29.8%	0.78	98.9%
Lupo 2011[105]	27.3%	24.7%	29.9%	0.78	98.9%
MacLean L, 2015[106]	27.4%	24.9%	30.1%	0.77	98.9%
Manaf NA, 2016[107]	27.1%	24.6%	29.7%	0.77	98.9%
Mancevska S, 2008[108]	27.4%	24.9%	30.0%	0.77	98.9%
Marakoğlu K, 2006[109]	27.2%	24.7%	29.8%	0.78	98.9%
Marwat MA, 2013[110]	27.3%	24.8%	30.0%	0.78	98.9%
Matheson KM, 2016[111]	27.2%	24.7%	29.8%	0.78	98.9%
Mayda AT, 2010[112]	27.4%	24.8%	30.0%	0.77	98.9%

Mehanna Z, 2006[113]	27.2%	24.7%	29.9%	0.78	98.9%
Melo-Carrillo A, 2012[114]	27.2%	24.7%	29.8%	0.78	98.9%
Miletic V, 2015[116]	27.3%	24.8%	29.9%	0.78	98.9%
Mojs EH, 2015[117]	27.4%	24.9%	30.1%	0.77	98.9%
Mosley TH, 1994[118]	27.3%	24.8%	29.9%	0.78	98.9%
Mousa OY, 2016[119]	27.3%	24.8%	30.0%	0.77	98.9%
Naja WJ, 2016[120]	27.2%	24.7%	29.9%	0.78	98.9%
Nasioudis, D, 2015[121]	27.2%	24.7%	29.8%	0.78	98.9%
Nava FR, 2013[122]	27.5%	25.0%	30.1%	0.76	98.9%
Newbury-Birch D, 2001[123]	27.4%	24.9%	30.1%	0.77	98.9%
Oku A, 2015[125]	27.2%	24.7%	29.8%	0.78	98.9%
Pan XF, 2015[127]	27.3%	24.8%	30.0%	0.78	98.9%
Paro HB, 2010[128]	27.2%	24.7%	29.9%	0.78	98.9%
Peleg-Sagy T, 2012[129]	27.2%	24.7%	29.8%	0.78	98.9%
Peleg-Sagy T, 2013[130]	27.1%	24.6%	29.8%	0.78	98.9%
Pereyra-Elías R, 2010[131]	27.2%	24.7%	29.9%	0.78	98.9%
Perveen S, 2016[132]	27.1%	24.6%	29.8%	0.78	98.9%
Phillips LC, 2006[133]	27.3%	24.8%	29.9%	0.78	98.9%
Pickard M, 2000[134]	27.4%	24.9%	30.0%	0.77	98.9%
Pillay N, 2016[135]	27.0%	24.5%	29.7%	0.77	98.9%
Pinzón-Amado A, 2013[136]	27.2%	24.7%	29.8%	0.78	98.9%
Prinz P, 2012[137]	27.4%	24.9%	30.1%	0.77	98.9%
Quince TA, 2012[138]	27.4%	25.0%	30.1%	0.75	98.9%
Rab F, 2008[139]	27.3%	24.8%	29.9%	0.78	98.9%
Ristic-Ignjatovic D, 2013[140]	27.3%	24.8%	29.9%	0.78	98.9%
Rizvi F, 2015[141]	27.2%	24.7%	29.8%	0.78	98.9%
Roh MS, 2009[142]	27.4%	25.0%	30.0%	0.72	98.8%

Romo-Nava F, 2016[143]	27.3%	24.8%	30.0%	0.77	98.9%
Rosal MC, 1997[144]	27.2%	24.7%	29.8%	0.78	98.9%
Saeed AA, 2016[145]	27.1%	24.6%	29.7%	0.77	98.9%
Samaranayake CB, 2011[146]	27.3%	24.8%	30.0%	0.78	98.9%
Saravanan C, 2014[147]	27.2%	24.7%	29.9%	0.78	98.9%
Schwenk TL, 2010[148]	27.3%	24.8%	30.0%	0.77	98.9%
Serra RD, 2015[149]	27.2%	24.7%	29.9%	0.78	98.9%
Seweryn M, 2015[150]	27.2%	24.6%	29.8%	0.79	98.9%
Shah AA, 2009[151]	27.2%	24.6%	29.9%	0.80	98.9%
Shariatpanaahi MV, 2007[152]	27.2%	24.7%	29.9%	0.78	98.9%
Shen L, 2009[153]	27.2%	24.7%	29.9%	0.78	98.9%
Sherina MS, 2004[154]	27.2%	24.7%	29.8%	0.78	98.9%
Shi M, 2015[155]	27.0%	24.6%	29.6%	0.75	98.9%
Shi M, 2016[156]	27.1%	24.6%	29.7%	0.74	98.8%
Shindel AW, 2011[157]	27.1%	24.6%	29.8%	0.78	98.9%
Sidana S, 2012[158]	27.3%	24.8%	29.9%	0.78	98.9%
Smith CK, 2007[159]	27.4%	24.9%	30.1%	0.77	98.9%
Smith JF, 2010[160]	27.2%	24.7%	29.9%	0.78	98.9%
Smith JF, 2011[161]	27.2%	24.7%	29.9%	0.78	98.9%
Sobowale K, 2014[162]	27.3%	24.8%	30.0%	0.77	98.9%
Sreeramareddy CT, 2007[163]	27.3%	24.8%	29.9%	0.78	98.9%
Sun L, 2011[164]	27.3%	24.8%	30.0%	0.76	98.8%
Supe AN, 1998[165]	27.0%	24.5%	29.7%	0.77	98.9%
Tang QS, 2005[166]	27.2%	24.7%	29.9%	0.78	98.9%
Thomas MR, 2006[167]	27.1%	24.6%	29.8%	0.78	98.9%
Thompson D, 2010[168]	27.1%	24.6%	29.8%	0.78	98.9%
Thompson G, 2016[169]	27.3%	24.8%	30.0%	0.78	98.9%

Tin TS, 2015[170]	27.4%	24.9%	30.1%	0.77	98.9%
Tjia J, 2005[171]	27.3%	24.8%	30.0%	0.77	98.9%
Valle R, 2013[174]	27.3%	24.8%	29.9%	0.78	98.9%
Vankar JR, 2014[175]	27.2%	24.7%	29.9%	0.78	98.9%
Vaysse B, 2014[176]	27.5%	24.9%	30.1%	0.77	98.9%
Vitaliano PP, 1988[177]	27.3%	24.7%	29.9%	0.78	98.9%
Voltmer E, 2012[178]	27.5%	25.0%	30.1%	0.77	98.9%
Walkiewicz M, 2012[179]	27.3%	24.8%	30.0%	0.78	98.9%
Wan YH, 2012[181]	27.1%	24.6%	29.8%	0.80	98.9%
Waqas A, 2015[182]	27.2%	24.7%	29.9%	0.78	98.9%
Wege N, 2016[183]	27.4%	24.9%	30.0%	0.77	98.9%
Wimsatt LA, 2015[184]	27.3%	24.8%	30.0%	0.77	98.9%
Wolf MR, 2016[185]	27.4%	24.9%	30.0%	0.77	98.9%
Wongpakaran N, 2010[186]	27.4%	24.9%	30.1%	0.77	98.9%
Yang F, 2014[187]	27.5%	25.0%	30.2%	0.76	98.9%
Yilmaz Y, 2014[188]	27.2%	24.7%	29.9%	0.78	98.9%
Yoon S, 2014[189]	27.3%	24.8%	30.0%	0.77	98.9%
Youssef FF, 2016[190]	27.2%	24.7%	29.8%	0.78	98.9%
Yusoff MS, 2013[191]	27.2%	24.7%	29.8%	0.78	98.9%
Yusoff MS, 2013[192]	27.2%	24.7%	29.9%	0.78	98.9%
Zeldow PB, 1987[193]	27.3%	24.8%	30.0%	0.78	98.9%
Zoccolillo M, 1986[194]	27.3%	24.8%	29.9%	0.78	98.9%
Zulfikar Ali RV, 1994[195]	27.3%	24.8%	29.9%	0.78	98.9%
Pooled estimate	27.2%	24.7%	29.9%	0.78	98.9%

Legend: Studies are ordered alphabetically by first author. Summary estimates were calculated omitting one study at a time using a random effects model.

eTable 4. Within-instrument heterogeneity analyses of studies reporting on the prevalence of depression or depressive symptoms among medical students. (Pages 17-19)

Stratified Meta-Analyses													**Meta-regression Analyses**								
Beck Depression Inventory (BDI), ≥10		**No. Studies**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I^2**		***P* for difference**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P (mod)***	**Q (mod)**
	Cross-sectional	23	33.0%	26.2%	40.6%	1661.9	0.6	98.7%		*0.02*	5.4		Survey Year	0.9%	0.3%	2.8	0.005	0.3%	1.5%	*0.005*	7.9
	Longitudinal	1	18.8%	11.9%	28.5%	0.0	--	--					Age	-2.6%	2.0%	-1.3	0.20	-6.6%	1.4%	*0.20*	1.6
													Proportion of Males	4.9%	16.1%	0.3	0.76	-26.7%	36.5%	*0.76*	0.1
	United States	4	13.0%	7.0%	22.8%	37.8	0.4	92.1%		*0.0004*	12.7										
	Not United States	20	37.5%	29.8%	45.9%	1549.0	0.6	98.8%													
	Preclinical students	8	24.0	15	34	22	0	96		*0.3*	1.										

	only		%	.8 %	.6 %	0.7	.5	.8 %		*1**	1 *									
	Both	12	41.8 %	35 .8 %	48 .1 %	26 5. 6	0 . 2	95 .9 %												
	Clinical students only	3	31.7 %	21 .6 %	43 .9 %	19 .0	0 . 2	89 .5 %												
	NOS <3	13	34.6 %	26 .5 %	43 .6 %	26 1. 1	0 . 5	95 .4 %		*0.5 0*	0. 5									
	NOS ≥3	11	30.0 %	20 .8 %	41 .0 %	12 80 .8	0 . 7	99 .2 %												
Patient Health Questionnaire-9 (PHQ-9), ≥10		**No. Studies**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I^2**		***P* for difference**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P* (mod)**	**Q (mod)**
	Cross-sectional	15	18.3 %	12 .8 %	25 .4 %	69 3. 3	0 . 7	98 .0 %		--	--		Survey Year	- 0. 6 %	1.9 %	- 0 . 3	0. 7 7	- 4.2 %	3.1 %	*0.7 7*	0.1
	Longitudinal	--	--	--	--	--	--	--					Age	0. 3 %	4.9 %	0 . 1	0. 9 6	- 9.4 %	9.9 %	*0.9 6*	0.0 03
													Proportion of Males	- 28	25. 0	- 1	0. 2	- 77.	20. 2	*0.2 5*	1.3

														.8 %	%	.2	5	8 %	%		
	United States	3	14.7 %	12.7 %	16.8 %	0.8	0	0 %		*0.23*	1.4										
	Not United States	12	19.1 %	12.6 %	28.0 %	659.7	0.8	98.3 %													
	Preclinical students only	3	21.3 %	9.8 %	40.4 %	65.6	0.6	96.9 %		*0.46*	0.5										
	Both	11	15.6 %	11.0 %	21.8 %	335.4	0.5	97.0 %													
	Clinical students only	--	--	--	--	--	--	--													
	NOS <3	10	15.1 %	9.6 %	23.1 %	304.3	0.7	97.0 %		*0.11*	2.5										
	NOS ≥3	5	25.8 %	15.5 %	39.7 %	254.4	0.5	98.4 %													
Primary Care Evaluation of Mental Disorders (PRIME-MD)		**No. Studies**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I^2**		***P* for difference**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P (mod)***	**Q (mod)**
	Cross-sectional	14	37.5	32	43	79	0	98		--	--		Survey	-	1.5	-	0.	-	-	*0.0*	4.0

			%	.0 %	.3 %	8.6	.2	.4 %					Year	2.9 %	%	2.0	05	5.8 %	0.1 %	*5*	
	Longitudinal	--	--	--	--	--	--	--					Age	--	--	--	--	--	--	--	--
													Proportion of Males	45.2 %	17 7.6 %	0.3	0.80	-30 3.0 %	39 3.3 %	*0.80*	0.1
	United States	14	37.5 %	32.0 %	43.3 %	79 8.6	0.2	98.4 %		--	--										
	Not United States	--	--	--	--	--	--	--													
	Preclinical students only	--	--	--	--	--	--	--		*0.92*	0.01										
	Both	13	37.6 %	32.0 %	43.5 %	68 8.0	0.2	98.3 %													
	Clinical students only	1	37.9 %	35.4 %	40.4 %	0	--	--													
	NOS <3	14	37.5 %	32.0 %	43.3 %	79 8.6	0.2	98.4 %		--	--										
	NOS ≥3	--	--	--	--	--	--	--													
Center for Epidemiologic		**No**	**Pre**	**L**	**U**	**Q**	**t**	**I^2**		***P***	**Q**			**Sl**	**SE**	**Z**	***P***	**L**	**U**	***P***	**Q**

Studies Depression Scale (CES-D), ≥16		. Studies	valence	CI	CI		au²			for difference	(diff)			ope				CI	CI	*(mod)*	(mod)
	Cross-sectional	12	42.4%	31.8%	53.8%	1164.6	0.6	99.1%		*0.42*	0.7		Survey Year	1.9%	0.7%	2.7	0.001	0.5%	3.2%	*0.01*	7.5
	Longitudinal	1	47.9%	40.9%	55.0%	0	--	--					Age	-1.7%	1.6%	-1.1	0.29	-4.9%	1.4%	*0.29*	1.1
													Proportion of Males	-16.0%	11.8%	-1.4	0.17	-39.0%	7.1%	*0.17*	1.8
	United States	6	34.4%	25.1%	45.1%	177.2	0.3	97.2%		*0.05*	3.8										
	Not United States	7	50.3%	38.4%	62.0%	408.0	0.4	98.5%													
	Preclinical students only	2	39.0%	35.0%	43.1%	0.2	0	0%		*0.97**	0*										
	Both	9	44.5%	32.1%	57.6%	1111.6	0.6	99.3%													
	Clinical students only	2	39.7%	12.4	75.3	14.0	1.	92.8													

				%	%		1	%												
	NOS <3	4	40.6 %	27.5 %	55.2 %	15.5	0.3	80.6 %		*0.75*	0.1									
	NOS ≥3	9	43.7 %	31.7 %	56.5 %	1137.9	0.6	99.3 %												
Hospital Anxiety and Depression Scale (HADS-D), ≥8		**No. Studies**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I^2**		***P* for difference**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P (mod)***	**Q (mod)**
	Cross-sectional	10	16.4 %	11.2 %	23.4 %	157.6	0.5	94.3 %		*<0.0001*	18.5		Survey Year	-0.3 %	0.6 %	-0.5	0.60	-1.4 %	0.8 %	*0.60*	0.3
	Longitudinal	2	6.5 %	5.6 %	7.6 %	0.9	0.0	0 %					Age	-4.3 %	7.7 %	-0.6	0.58	-19.5 %	10.8 %	*0.58*	0.3
													Proportion of Males	14.4 %	25.1 %	0.6	0.57	-34.8 %	63.6 %	*0.57*	0.3
	United States	--	--	--	--	--	--	--		--	--										
	Not United States	12	13.6 %	8.4 %	21.3 %	389.1	0.8	97.2 %													

	Preclinical students only	6	10.7%	4.4%	23.8%	295.5	1.4	98.3%		*0.84**	0.04*									
	Both	3	27.3%	23.3%	31.6%	3.2	0.0	36.9%												
	Clinical students only	2	9.1%	2.4%	29.1%	7.6	0.9	86.9%												
	NOS <3	5	10.2%	5.9%	17.0%	32.5	0.4	87.7%		*0.14*	2.2									
	NOS ≥3	7	17.1%	10.8%	26.0%	137.9	0.5	95.6%												
Zung Self-Rating Depression Scale (Zung-SDS), ≥50		**No. Studies**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I^2**		***P* for difference**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P* (mod)**	**Q (mod)**
	Cross-sectional	10	21.7%	13.7%	32.5%	457.3	0.8	98.0%		*0.49*	0.5		Survey Year	0.3%	0.6%	0.4	0.68	-1.0%	1.5%	*0.68*	0.2
	Longitudinal	1	18.1%	13.7%	23.6%	0	--	--					Age	2.1%	3.5%	0.6	0.55	-4.8%	9.0%	*0.55*	0.36

													Proportion of Males	-8.1%	20.0%	-0.4	0.69	-47.3%	31.2%	*0.69*	0.16
	United States	1	18.1%	13.7%	23.6%	0	--	--		*0.49*	0.5										
	Not United States	10	21.7%	13.7%	32.5%	457.3	0.8	98.0%													
	Preclinical students only	5	18.3%	9.7%	32.0%	73.5	0.7	94.6%		*0.50*	0.5										
	Both	5	24.2%	13.4%	39.8%	238.3	0.7	98.3%													
	Clinical students only	--	--	--	--	--	--	--													
	NOS <3	7	21.6%	16.7%	27.5%	30.3	0.1	80.2%		*0.93*	0.01										
	NOS ≥3	4	20.8%	9.1%	40.8%	309.3	1.0	99.0%													
Beck Depression Inventory (BDI), ≥17		**No. Stud**	**Prevalence**	**LCI**	**UCI**	**Q**	**tau²**	**I²**		***P* for differ**	**Q (diff)**			**Slope**	**SE**	**Z**	***P***	**LCI**	**UCI**	***P (mod)***	**Q (mod)**

		ies								**nce**										
	Cross-sectional	6	21.7%	12.0%	36.0%	173.5	0.8	97.1%		--	--		Survey Year	-0.1%	1.5%	-0.1	0.93	-3.0%	2.8%	*0.93*	0.01
	Longitudinal	--	--	--	--	--	--	--					Age	5.1%	6.0%	0.9	0.39	-6.6%	16.7%	*0.39*	0.7
													Proportion of Males	34.5%	34.9%	1.0	0.32	-33.9%	103.0%	*0.32*	1.0
	United States	--	--	--	--	--	--	--		--	--										
	Not United States	6	21.7%	12.0%	36.0%	173.5	0.8	97.1%													
	Preclinical students only	3	21.6%	4.5%	61.8%	128.3	2.4	98.4%		*0.99*	0										
	Both	2	21.4%	6.6%	51.1%	35.0	0.9	97.1%													
	Clinical students only	--	--	--	--	--	--	--													
	NOS <3	6	21.7%	12.0%	36.0%	173.5	0.8	97.1%		--	--										
	NOS ≥3	--	--	--	--	--	--	--													

General Health Questionnaire-12 (GHQ-12), ≥4		No. Studies	Prevalence	LCI	UCI	Q	tau²	I²		P for difference	Q (diff)			Slope	SE	Z	P	LCI	UCI	P (mod)	Q (mod)
	Cross-sectional	4	33.0%	24.3%	42.9%	47.2	0.2	93.6%		*0.22*	1.5		Survey Year	-1.0%	1.0%	-1.0	0.33	-3.0%	1.0%	*0.33*	0.9
	Longitudinal	2	41.9%	31.4%	53.2%	3.7	0.1	72.7%					Age	5.5%	6.1%	0.9	0.36	-6.4%	17.4%	*0.36*	0.8
													Proportion of Males	-29.9%	45.4%	-0.7	0.51	-118.8%	59.1%	*0.51*	0.4
	United States	--	--	--	--	--	--	--		--	--										
	Not United States	6	35.7%	28.5%	43.6%	56.0	0.2	91.1%													
	Preclinical students only	3	38.1%	29.7%	47.3%	9.6	0.1	79.3%		*0.55*	0.4										
	Both	3	33.3%	21.9%	47.1%	46.0	0.2	95.7%													
	Clinical students only	--	--	--	--	--	--	--													
	NOS <3	5	34.5	26	43	46	0	91		*0.1*	2.										

			%	.3 %	.7 %	.7	. 2	.4 %		*6*	0										
	NOS ≥3	1	41.9 %	37 .2 %	46 .8 %	0. 0	--	--													

Legend: The *P* value marked by the asterisk (*) denotes a comparison of studies reporting on preclinical students only to those reporting on clinical students only. LCI denotes lower 95% confidence interval; SE, standard error; UCI, upper 95% CI.

eTable 5. Sensitivity analysis of the prevalence of suicidal ideation among medical students.

Study Omitted	Prevalence (%)	LCI	UCI	τ^2	I^2
Ahmed SA, 2016[5]	11.0%	8.8%	13.7%	0.34	96.0%
Alem A, 2005[11]	11.4%	9.1%	14.0%	0.32	95.9%
Alexandrino-Silva C, 2009[12]	11.0%	8.8%	13.6%	0.33	96.0%
Amiri L, 2012[18]	11.3%	9.1%	13.9%	0.32	96.0%
Chen JQ, 2004[41]	10.9%	8.7%	13.4%	0.32	95.6%
Dahlin M, 2005[45]	11.4%	9.2%	14.1%	0.32	95.9%
de Melo Cavestro J, 2006[48]	11.3%	9.1%	13.9%	0.32	96.0%
Dyrbye LN, 2008[54]	11.1%	8.8%	13.9%	0.37	96.0%
Dyrbye LN, 2014[57]	11.2%	8.8%	14.1%	0.39	95.9%
Eskin M, 2011[61]	11.1%	8.9%	13.8%	0.34	96.0%
Goebert D, 2009[65]	11.4%	9.1%	14.1%	0.32	95.8%
Khokher S, 2005[94]	10.5%	8.6%	12.9%	0.28	95.2%
MacLean L, 2015[106]	11.1%	8.9%	13.7%	0.33	96.0%
Menezes RG, 2012[115]	11.1%	8.9%	13.8%	0.33	96.0%
Okasha A, 1981[124]	11.0%	8.8%	13.7%	0.33	96.0%
Osama M, 2014[126]	10.4%	8.7%	12.5%	0.22	93.9%
Sobowale K, 2014[162]	11.3%	9.1%	14.0%	0.33	96.0%
Thompson D, 2010[168]	10.7%	8.6%	13.2%	0.31	95.9%
Tin TS, 2015[170]	11.3%	9.1%	14.0%	0.32	95.9%
Tran QA, 2015[172]	11.2%	8.9%	14.0%	0.35	95.9%
Tyssen R, 2001[173]	11.0%	8.8%	13.6%	0.33	95.9%
Wallin U, 2003[180]	11.0%	8.8%	13.7%	0.33	96.0%
Wan YH, 2012[181]	11.5%	9.5%	14.0%	0.26	94.5%
Wege N, 2016[183]	11.3%	9.1%	14.0%	0.33	95.9%
Pooled estimate	**11.1%**	**9.0%**	**13.7%**	**0.32**	**95.8%**

Legend: Studies are ordered alphabetically by first author. Summary estimates were calculated omitting one study at a time using a random effects model.

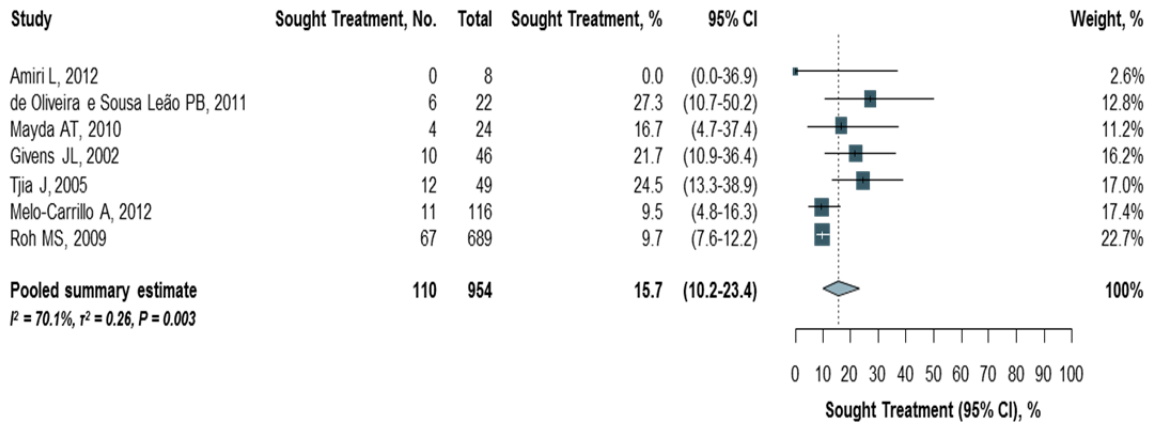
eTable 6. Sensitivities and specificities of commonly used instruments for diagnosing major depressive disorder

Instrument	Cutoff	Sensitivity	Specificity
Aga Khan University Anxiety and Depression Scale (AKUADS)[82]	≥19	74	81
Beck Depression Inventory (BDI)[196]	≥10	91 (86 to 96)	79 (52 to 100)
Beck Depression Inventory (BDI)[197]	≥16	79	91
Beck Depression Inventory-II (BDI-II)[198]	≥10	100	75
Beck Depression Inventory-II (BDI-II)[198]	≥14	88	84
Beck Depression Inventory-II (BDI-II)[198]	≥17	81	79
Beck Depression Inventory-II (BDI-II)[198]	≥20	82	75
Center for Epidemiological Studies Depression (CES-D)[196]	≥16	84 (70 to 89)	74 (68 to 80)
Depression Anxiety Stress Scale-21 (DASS-21)[199]	≥10	91	40
Depression Anxiety Stress Scale-42 (DASS-42)[199]	≥10	91	40
General Depression Scale Short Form (ADS-K)[200]	>17	89.7	87
General Health Questionnaire-12 (GHQ-12)[196]	≥4	86 (76 to 95)	66 (57 to 74)
Health-Related Self-Reported Scale (HRSRS)[201]	≥25	75.1	93.4
Hospital Anxiety and Depression Scale (HADS-D)[202]	≥11	61	97
Hospital Anxiety and Depression Scale (HADS-D)[202]	≥12	50	98
Hospital Anxiety and Depression Scale (HADS-D)[202]	≥7	83	84
Hospital Anxiety and Depression Scale (HADS-D)[202]	≥8	80	88
Kutcher Adolescent Depression Scale (KADS)[203]	≥6	92	71
Patient Health Questionnaire-9 (PHQ-9)[204]	≥10	88	88
Patient Health Questionnaire-9 (PHQ-9)[204]	≥9	95	84
Patient Health Questionnaire-9 (PHQ-9)[204]	>10	83	89
Primary Care Evaluation of Mental Disorders (PRIME-MD)[196]	≥1	91 (81 to 100)	66 (48 to 84)
Zung Self-Rating Depression Scale (Zung-SDS)[205]	≥40	89	75
Zung Self-Rating Depression Scale (Zung-SDS)[196]	≥50	86 (73 to 100)	76 (57 to 95)

Legend: Sensitivities and specificities (and where available, 95% confidence intervals) for the diagnosis of criterion-defined major depressive disorder (MDD) for selected depression screening instruments at various cutoffs are reported above as published in the contemporary literature.

eFigure 1.

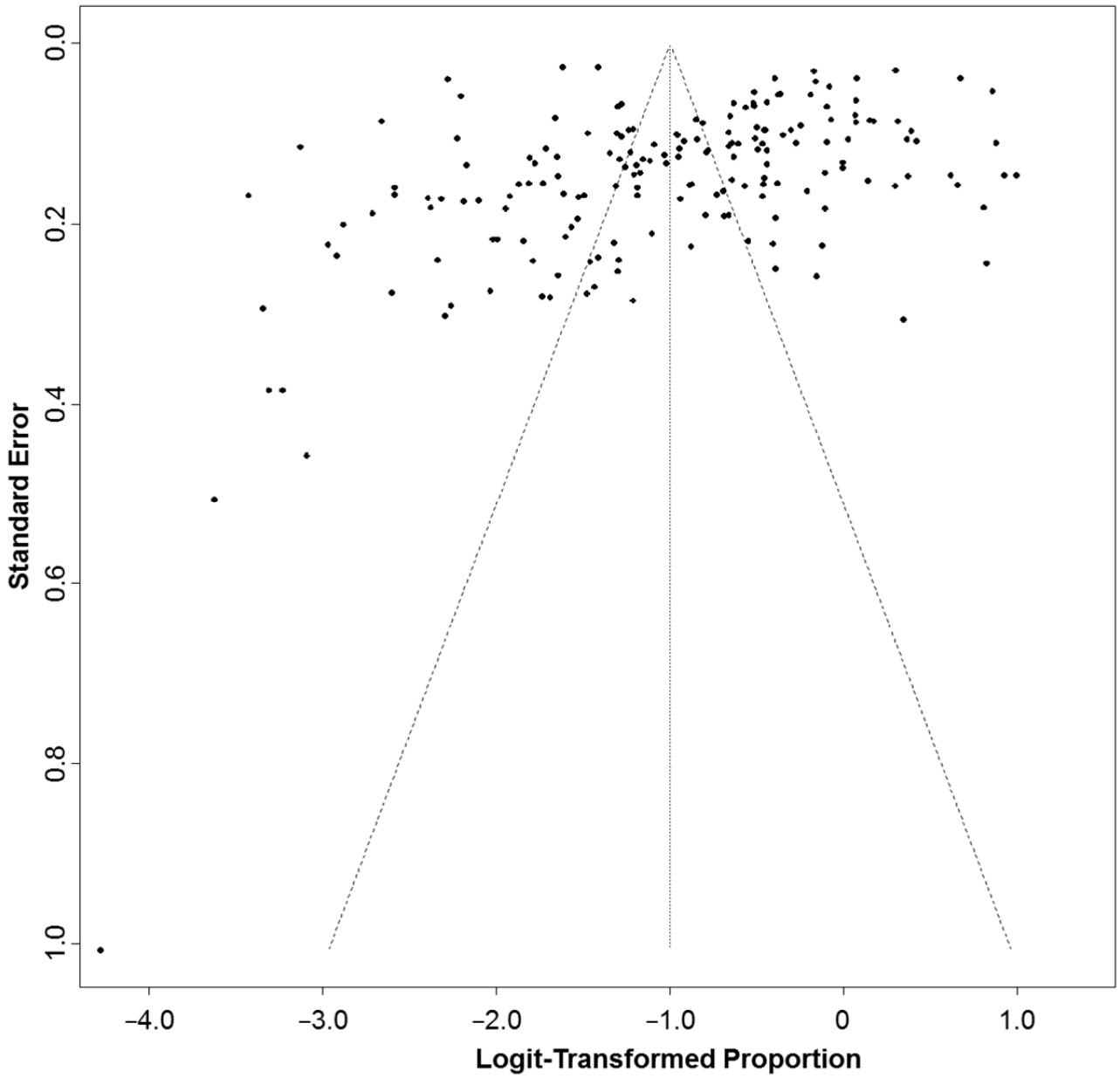
eFigure 1. Meta-analysis of the percentage of medical students who screened positive for depression and sought psychiatric or other mental health treatment



Legend: Contributing studies are sorted by increasing sample size. The dotted line marks the overall summary estimate for all studies, 15.7% (110/954 individuals, 95% CI: 10.3-23.4%, Q = 20.1, τ^2 = 0.26, I^2 = 70.1%). The area of each square is proportional to the inverse variance of the estimate. Horizontal lines indicate 95% confidence intervals of the estimate.

eFigure 2.

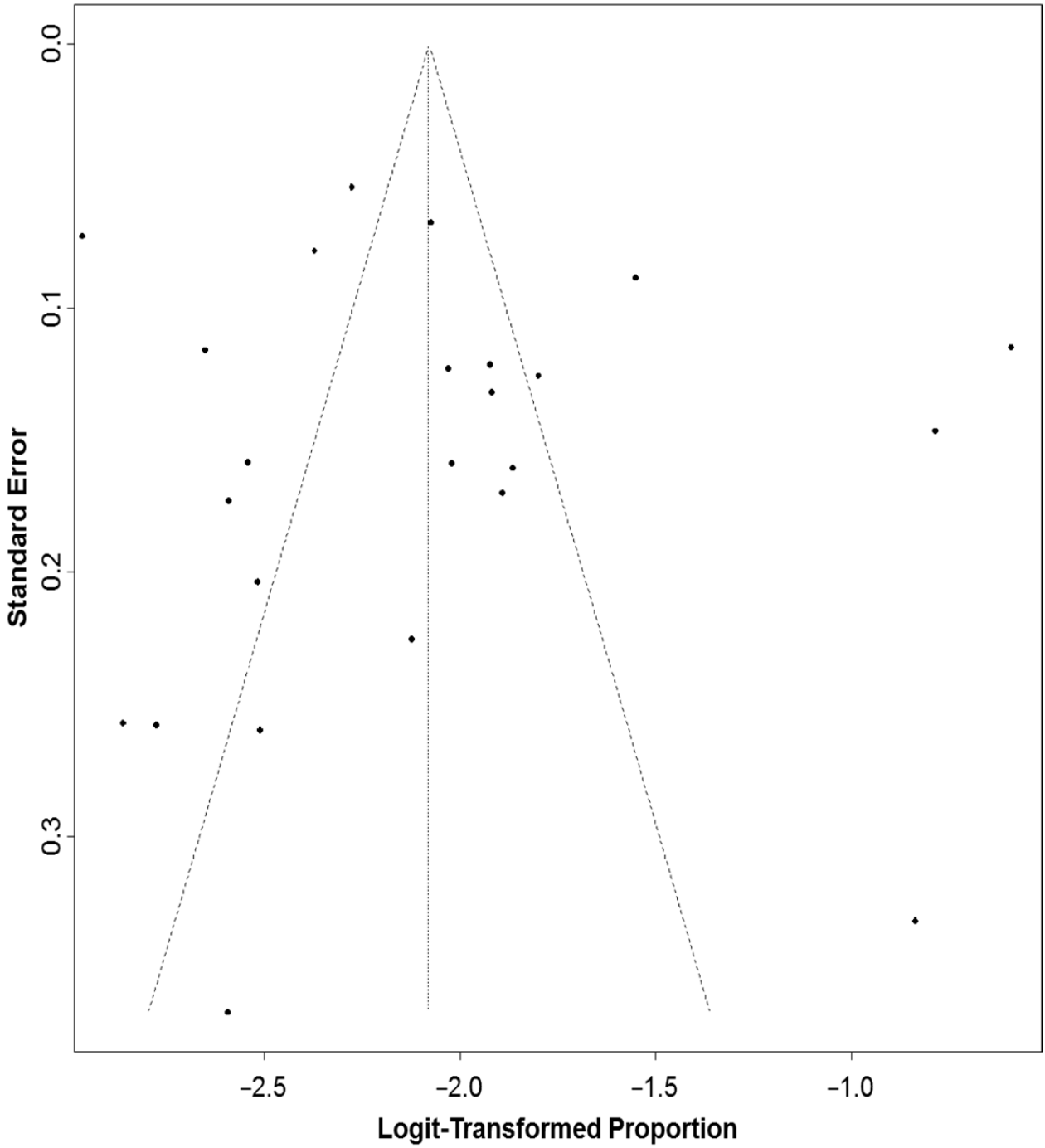
eFigure 2. Assessment of small study effects by funnel plot for the 183 studies reporting on depression or depressive symptom prevalence



Legend: The contour lines define the region within which 95% of points would be expected to lie in the absence of both heterogeneity and publication bias. The total overall estimate of the meta-analysis is represented by the vertical line. There was evidence of significant publication bias (Egger's test $P = 0.001$).

eFigure 3.

eFigure 3. Assessment of small study effects by funnel plot for the 24 studies reporting on suicidal ideation prevalence



Legend: The contour lines define the region within which 95% of points would be expected to lie in the absence of both heterogeneity and publication bias. The total overall estimate of the meta-analysis is represented by the vertical line. There was minimal asymmetry, suggesting the absence of significant publication bias (Egger's test $P = 0.49$).

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