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Depression and Suicide Risk Screening
Updated Evidence Report and Systematic Review for the US Preventive Services Task Force

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IMPORTANCE Depression is common and associated with substantial burden. Suicide rates have increased over the past decade, and both suicide attempts and deaths have devastating effects on individuals and families.

OBJECTIVE To review the benefits and harms of screening and treatment for depression and suicide risk and the accuracy of instruments to detect these conditions among primary care patients.

DATA SOURCES MEDLINE, PsychINFO, Cochrane library through September 7, 2022; references of existing reviews; ongoing surveillance for relevant literature through November 25, 2022.

STUDY SELECTION English-language studies of screening or treatment compared with control conditions, or test accuracy of screening instruments (for depression, instruments were selected a priori; for suicide risk, all were included). Existing systematic reviews were used for treatment and test accuracy for depression.

DATA EXTRACTION AND SYNTHESIS One investigator abstracted data; a second checked accuracy. Two investigators independently rated study quality. Findings were synthesized qualitatively, including reporting of meta-analysis results from existing systematic reviews; meta-analyses were conducted on original research when evidence was sufficient.

MAIN OUTCOMES AND MEASURES Depression outcomes; suicidal ideation, attempts, and deaths; sensitivity and specificity of screening tools.

RESULTS For depression, 105 studies were included: 32 original studies (N=385 607) and 73 systematic reviews (including ≈2138 studies [N ≈ 9.8 million]). Depression screening interventions, many of which included additional components beyond screening, were associated with a lower prevalence of depression or clinically important depressive symptomatology after 6 to 12 months (pooled odds ratio, 0.60 [95% CI, 0.50-0.73]; reported in 8 randomized clinical trials [n=10 244]; I^2 = 0%). Several instruments demonstrated adequate test accuracy (eg, for the 9-item Patient Health Questionnaire at a cutoff of 10 or greater, the pooled sensitivity was 0.85 [95% CI, 0.79-0.89] and specificity was 0.85 [95% CI, 0.82-0.88]; reported in 47 studies [n = 11 234]). A large body of evidence supported benefits of psychological and pharmacologic treatment of depression. A pooled estimate from trials used for US Food and Drug Administration approval suggested a very small increase in the absolute risk of a suicide attempt with second-generation antidepressants (odds ratio, 1.53 [95% CI, 1.09-2.15]; n = 40 857; 0.7% of antidepressant users had a suicide attempt vs 0.3% of placebo users; median follow-up, 8 weeks). Twenty-seven studies (n = 24 826) addressed suicide risk. One randomized clinical trial (n=443) of a suicide risk screening intervention found no difference in suicidal ideation after 2 weeks between primary care patients who were and were not screened for suicide risk. Three studies of suicide risk test accuracy were included; none included replication of any instrument. The included suicide prevention studies generally did not demonstrate an improvement over usual care, which typically included specialty mental health treatment.

CONCLUSIONS AND RELEVANCE Evidence supported depression screening in primary care settings, including during pregnancy and postpartum. There are numerous important gaps in the evidence for suicide risk screening in primary care settings.

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Depression is a common mental disorder in the US, with substantial economic costs. In 2019, an estimated 7.8% of US adults experienced at least 1 major depressive episode and 5.3% of adults experienced a major depressive episode with severe impairment in the past year.[1] In 2019 in the US, 47 511 deaths were attributable to suicide.[2] Suicide rates are increasing, with a 31% increase in suicide deaths in the US between 2001 and 2017.[3]

In 2016, the US Preventive Services Task Force (USPSTF) recommended screening for depression in the general adult population, including pregnant and postpartum persons.[4] The task force further stated that screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up (B recommendation). In 2014, the USPSTF concluded that the evidence was insufficient to assess the balance of benefits and harms associated with screening for suicide risk (I statement) in adolescents, adults, and older adults.[5] This systematic review was conducted to support the USPSTF in updating its recommendations on depression[4] and suicide risk[5] screening.

Methods

Scope of Review

Figure 1 shows the analytic framework and key questions (KQs) that guided this review, which were developed in consultation with members of the USPSTF and covered screening for depression, anxiety, and suicide risk. The overall KQ (KQ1/1a) assessed the direct evidence on whether screening programs result in improved outcomes, while the other KQs assessed different parts of the indirect stream of evidence. There were no deviations from the original research plan. In the current publication, evidence on the benefits and harms of screening for and treatment of depression and suicide risk in adults and the accuracy of screening tools are discussed. Detailed methods and results are available in the full evidence review.[7] In addition to addressing the KQs, the full evidence review also reports evidence related to contextual questions and includes an appendix addressing what is known about inequities in etiology or risk factors for mental health conditions, diagnosis, treatment access and uptake, and treatment outcomes across racial and ethnic groups.

Data Sources and Searches

Ovid MEDLINE, the Cochrane Central Register of Controlled Clinical Trials, the Cochrane Database of Systematic Reviews, and PsycINFO were searched through September 7, 2022. For KQ1, KQ2, and KQ3, the search start dates were January of 2014 (depression) and January of 2012 (suicide risk) for original research (KQ1/1a, KQ2, and KQ3, bridging from the previous USPSTF review) and January of 2015 for existing systematic reviews (KQ4 and KQ5, seeking existing systematic reviews published in the past 5 years). Detailed search strategies are listed in the eMethods in the Supplement. Searches were supplemented by reference lists of relevant reviews, including prior USPSTF reviews,[8,9] and hand-searching the Cochrane Database of Systematic Reviews. Article alerts and targeted searches of journals to identify major studies published in the interim that may affect the conclusions or understanding of the evidence and the related USPSTF recommendation were used as part of ongoing surveillance. The last surveillance was conducted on November 25, 2022, and 1 existing systematic reviews was added to the review.[10]

Study Selection

Two investigators independently reviewed titles, abstracts, and full-text articles using predefined eligibility criteria. For KQ1/1a and KQ3 (benefits and harms of screening), randomized clinical trials (RCTs) of adult primary care patients, including pregnant persons, investigating the benefits or harms of screening programs for depression or suicide risk were included. Studies were included that had unscreened control groups (KQ1) and in which the control group was also screened, but the screening results were not given to the participants' primary care clinician (KQ1a). Included studies could have additional components beyond screening, such as referral support, training in diagnosis or management, and patient materials.

For KQ2 (test accuracy), evidence on depression screening instruments was limited only to prespecified tools determined to be the most widely used or recommended screening tools for depression: Patient Health Questionnaire (PHQ), any version; Center for Epidemiologic Studies Depression Scale (CES-D); Edinburgh Postpartum Depression Scale (EPDS) for perinatal persons; and Geriatric Depression Scale (GDS) for older adults. These tools had been identified a priori as being the most widely used or recommended, based on recommendations of professional societies and government entities, systematic reviews, implementation studies, and clinicians working in some large health systems. Existing systematic reviewss were used to evaluate all instruments except the GDS, which was addressed using primary test accuracy studies because no recent, relevant existing systematic reviews were found. Primary studies were also used to examine suicide risk screening, with no restrictions on specific tools.

For KQ4 and KQ5 (benefits and harms of treatment), RCTs of psychological, pharmacological, or combination interventions among people with elevated risk of suicide compared with control conditions (eg, placebo, usual care [including usual mental health specialty care], wait list, or attention control conditions) were included. For depression, existing systematic reviews were used to address KQ4 and KQ5, adapting a decision tool developed by Pollock et al[11] to identify the most current and comprehensive evidence.

Data Extraction and Quality Assessment

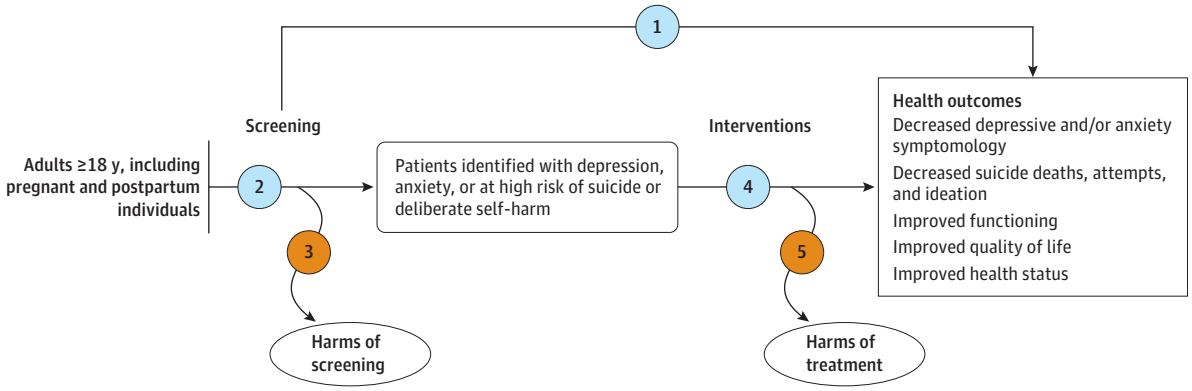
Two independent investigators rated the quality of studies as "good," "fair," or "poor," using predefined criteria for each study type, in accordance with the USPSTF methods[6] (eTable 1 in the Supplement). Discrepancies between raters were resolved by discussion or consultation with the larger review team. Studies rated as "poor" quality due to critical methodological limitations were excluded.

Data from each included study were extracted into detailed forms using DistillerSR (Evidence Partners). One reviewer completed primary data abstraction, and a second reviewer checked all data for accuracy and completeness. Study inclusion criteria, population characteristics, intervention or screening tool details, comparators, and results for outcomes defined a priori were extracted.

Data Synthesis and Analysis

Findings were synthesized using text, tables, and figures; where possible, quantitative syntheses with meta-analysis were conducted of test accuracy and RCT findings. For meta-analysis of RCTs

Figure 1. Analytic Framework: Depression and Suicide Risk Screening



Key questions

1 Do depression, anxiety, or suicide risk screening programs in primary care or comparable settings result in improved health outcomes in adults, including pregnant and postpartum persons?
a. Does sending depression, anxiety, or suicide risk screening test results to providers (with or without additional care management supports) result in improved health outcomes?

2 Do instruments to screen for depression, anxiety, and/or high suicide risk accurately identify adults, including pregnant and postpartum persons, with depression, anxiety, and high suicide risk in primary care or comparable settings?

3 What are the harms associated with screening for depression, anxiety, or suicide risk in primary care or comparable settings in adults, including pregnant and postpartum persons?

4 Does treatment (psychotherapy or pharmacotherapy) of depression, anxiety, or high suicide risk result in improved health outcomes in adults, including pregnant and postpartum persons?

5 What are the harms of treatment (psychotherapy or pharmacotherapy) of depression, anxiety, or high suicide risk in adults, including pregnant and postpartum persons?

Evidence reviews for the US Preventive Services Task Force (USPSTF) use an analytic framework to visually display the key questions that the review will address to allow the USPSTF to evaluate the effectiveness and safety of a preventive service. The questions are depicted by linkages that relate interventions and outcomes. A dashed line indicates a health outcome that immediately follows an intermediate outcome. For more details see the USPSTF Procedure Manual.[6]

of depression screening programs (KQ1/1a) and treatment for increased suicide risk (KQ4), the restricted maximum likelihood model with the Knapp-Hartung correction for small numbers of studies was used.[12,13] For dichotomous outcomes, study-reported adjusted risk ratios were used if available; if not, unadjusted risk ratios were calculated. For continuous outcomes, change from baseline in each group was the measure for analysis. Between-group standardized mean differences (Hedges g) were used because studies used a variety of specific measures.

For meta-analysis of data relevant to KQ2, data from 2 × 2 contingency tables were analyzed using a bivariate model if possible, which modeled sensitivity and specificity simultaneously. If there were not enough studies to use the bivariate model, sensitivity and specificity were pooled separately, using random-effects models with the method of DerSimonian and Laird.[14] For all analyses, statistical heterogeneity was assessed using the I^2 statistic.

Analyses were conducted in Stata version 16.1 (StataCorp). Significance testing was 2-sided, and results were considered statistically significant if $P \leq .05$.

The overall strength of the evidence for each KQ was assessed as high, moderate, low, or insufficient based on the overall quality of the studies, consistency of results between studies, precision of findings, and limitations of the body of evidence, using methods developed for the USPSTF.[6] Discrepancies were resolved by discussion. Additionally, the applicability of the findings to US primary care populations and settings was assessed.

Results

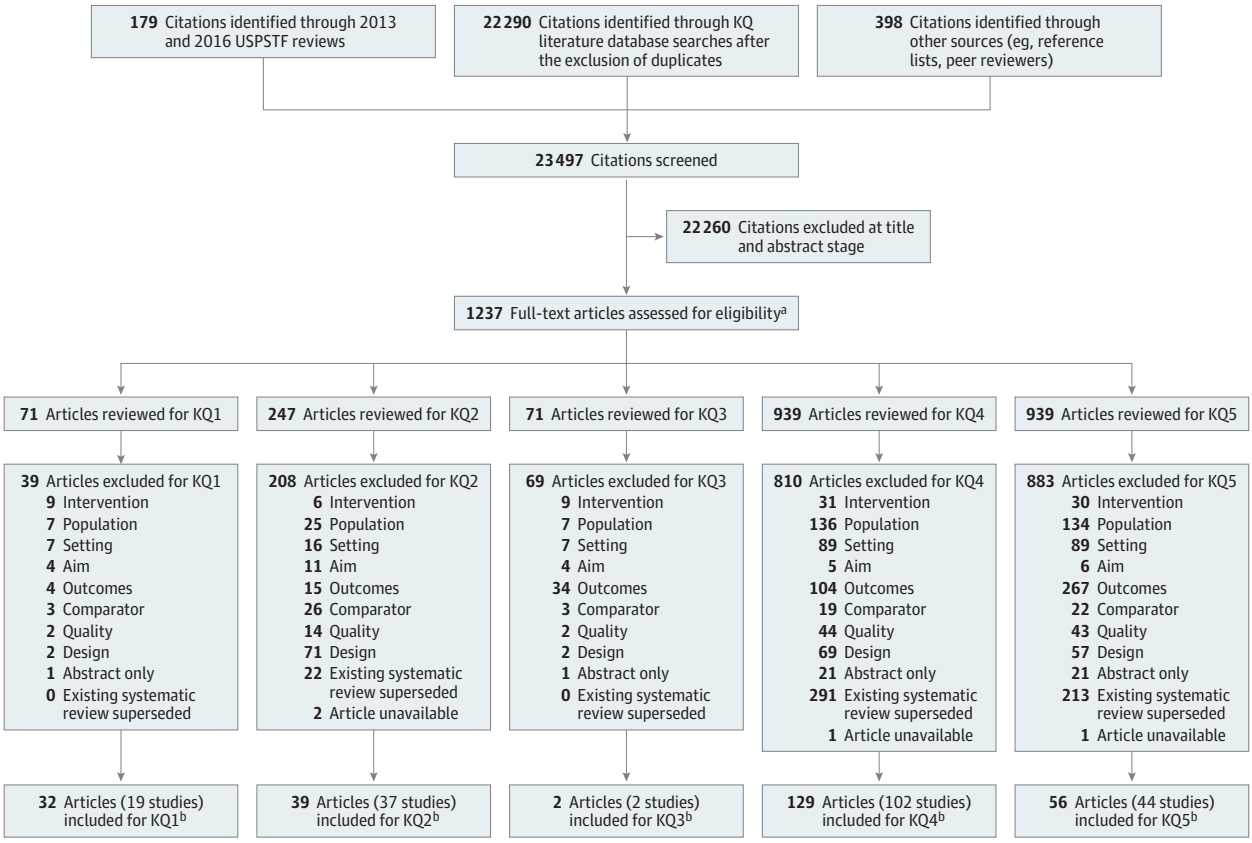
Altogether, 105 publications were included for depression: 32 original studies (N=385 607) and 73 systematic reviews (including ≈2138 studies [N ≈ 9.8 million]); 27 studies (n = 24 826) addressed suicide risk (**Figure 2**).

Benefits of Screening

Key Question 1. Do depression or suicide risk screening programs in primary care or comparable settings result in improved health outcomes in adults, including pregnant and postpartum persons?
Key Question 1a. Does sending depression or suicide risk screening test results to providers (with or without additional care management supports) result in improved health outcomes?

Seventeen trials (reported in 28 publications) examined depression screening,[15-30] including 1 that examined screening for

Figure 2. Literature Search Flow Diagram: Depression and Suicide Risk Screening



Reasons for Exclusion: Intervention: Study used an excluded intervention/screening approach. Population: Study was not conducted in an average-risk population. Setting: Study was not conducted in a country relevant to US practice. Aim: Study aim not relevant. Outcomes: Study did not have relevant outcomes or had incomplete outcomes. Comparator: Study included a comparator group that was not included. Quality: Study did not meet criteria for fair or good quality. Design: Study did not use an included design. Existing systematic review superseded: Existing systematic review was superseded by one that was more contemporary, comprehensive, or relevant.

[a] Studies may appear in more than 1 key question (KQ).

[b] Review incorporates and updates the evidence related to screening for and treatment of depression and suicide risk while adding evidence related to screening for and treatment of anxiety disorders and combination approaches that address more than 1 of these conditions. New primary evidence includes 3 studies for KQ1 evidence, 25 studies for KQ2 evidence, 0 studies for KQ3 evidence, 45 studies for KQ4 evidence, and 9 studies for KQ5 evidence. Existing systematic reviews for large, mature bodies of evidence were also included.

depression and several other conditions[31] (eTable 2 in the Supplement). Only 4 of the included studies had a control group that was not screened for depression[19,25,26,28]; these were considered KQ1 studies. The remaining studies screened all participants but only gave the screening results to the clinicians of intervention group participants, meeting criteria for KQ1a. Studies meeting criteria for KQ1 and KQ1a are combined and not discussed separately. The included trials covered general adult,[15-19,31] older adult,[20-23] and perinatal[24-30] populations.

Evidence supported the benefits of screening for depression (**Table 1**). For example, screening interventions, most of which also included other care management components, were associated with a lower prevalence of depression or clinically important depressive symptomatology at 6 months postbaseline or postpartum (or the closest follow-up to 6 months; odds ratio [OR], 0.60 [95% CI, 0.50-0.73]; 8 RCTs [n = 10 244]; I^2=0%). Among participants with symptoms above a specified level at baseline, screening interventions were associated with a greater likelihood of remission or falling below a specified level of depression symptomatology (OR, 1.58 [95% CI, 1.23-2.02]; 8 RCTs [n = 2302]; I^2=0%) after 6 months (or the closest follow-up to 6 months).

Only 1 short-term RCT (n=443) examined screening for suicide risk, which was limited to primary care patients who had screened positive for depression (eTable 3 in the Supplement).[32] That trial reported no statistically significant group differences in suicidal ideation at 2 weeks' follow-up and 1 suicide attempt among all study participants (eTable 4 in the Supplement).

Accuracy of Screening

Key Question 2. Do instruments to screen for depression or suicide risk accurately identify adults, including pregnant and postpartum persons, with depression or increased suicide risk in primary care or comparable settings?

Fourteen primary studies[33-46] and 10 existing systematic reviews[47-56] were included that examined the test accuracy of screening for depression (eTables 5 and 6 in the Supplement). The

Table 1. Summary of Meta-analysis Results for Depression Outcomes Among Depression Screening Studies (KQ1)

Outcome	No. studies (No. analyzed)	Pooled result (95% CI)[a]	I^2, %	τ^2	Range of effects[b]	Median (IQR) effects[b]
Prevalence (met criteria for depression or score above cutoff)						
All studies	8 (10 244)	OR, 0.60 (0.50-0.73)	0	0.0	0.30 to 1.11 ARD, −9.1 to 1.4	0.67 (0.47-0.80) ARD, −5.2 (−6.8 to −2)
General	1 (218)	OR, 0.67 (0.37-1.21)	NA	NA	0.67 ARD, −9	NA (1 effect total)
Older	1 (206)	OR, 0.70 (0.38-1.26)	NA	NA	0.70 to 0.80 ARD, −8 to −5	NA (2 effects total)
Postpartum	5 (9202)	OR, 0.54 (0.40-0.73)	25.6	.02	0.30 to 1.11 ARD, −9.1 to 1.4	0.50 (0.40-0.67) ARD, −5.2 (−6.1 to −1.9)
Pregnant	1 (618)	OR, 0.80 (0.48-1.35)	NA	NA	0.80 ARD, −2	NA (1 effect total)
Remission (did not meet criteria for depression or score below cutoff, among those with symptoms at baseline)						
All studies	8 (2302)	OR, 1.58 (1.23-2.02)	0	0	0.81 to 4.81 ARD, −18 to 33.8	1.41 (1.14-1.95) ARD, 7.2 (2.9 to 15.2)
General	3 (1396)	OR, 1.52 (1.41-1.63)	0	0	0.81 to 4.06 ARD, −5 to 33	1.41 (1.14-1.70) ARD, 7.7 (3 to 14)
Older	2 (259)	OR, 0.97 (0.21-4.41)	0	0	0.83 to 2.49 ARD, −18 to 5	1.14 (0.89-1.33) ARD, −0.6 (−4.7 to 3)
Postpartum	2 (562)	OR, 1.83 (0.27-12.27)	0	0	1.67 to 2.34 ARD, 11.7 to 19	2.34 (1.67-2.34) ARD, 17.7 (11.7 to 19)
Pregnant	1 (85)	OR, 4.81 (1.81-12.80)	NA	NA	4.81 ARD, 33.8	NA (1 effect total)
Combined reduced depression[c,d]						
All studies	16 (8448)	OR, 1.63 (1.37-1.95)	0.5	0		
General	5 (1675)	OR, 1.53 (1.38-1.70)	0	0		
Older	4 (675)	OR, 1.00 (0.56-1.78)	15.2	.02		
Postpartum	6 (6013)	OR, 1.98 (1.60-2.43)	0	0		
Pregnant	1 (85)	OR, 4.81 (1.81-12.80)	NA	NA		
Symptom severity (change in depression symptom scores)						
All studies	9 (5543)	Mean difference in change, −1.0 (−2.3 to 0.3)	74.4	1.1	−8.2 to 2.6	−1 (−2.5 to 0.3)
All studies	6 (3790)	SMD, −.09 (−0.36 to 0.18)	79.6	0.04	NR	NR

Abbreviations: ARD, absolute risk difference; NA, not applicable; NR, not reported; OR, odds ratio; SMD, standardized mean difference.

[a] Effect based on restricted maximum likelihood model with the Knapp-Hartung adjustment for small samples.

[b] Range of effects for all study groups, subgroup analyses, and time points, ie, not limited to records in the meta-analysis.

[c] As available, selected depression remission or scoring below a cutoff first, depression prevalence or scoring above a cutoff (reversed) second, and depression response third.

[d] Range of effects and median (IQR) effects not shown because reversal of results from some studies creates misleading ARD values.

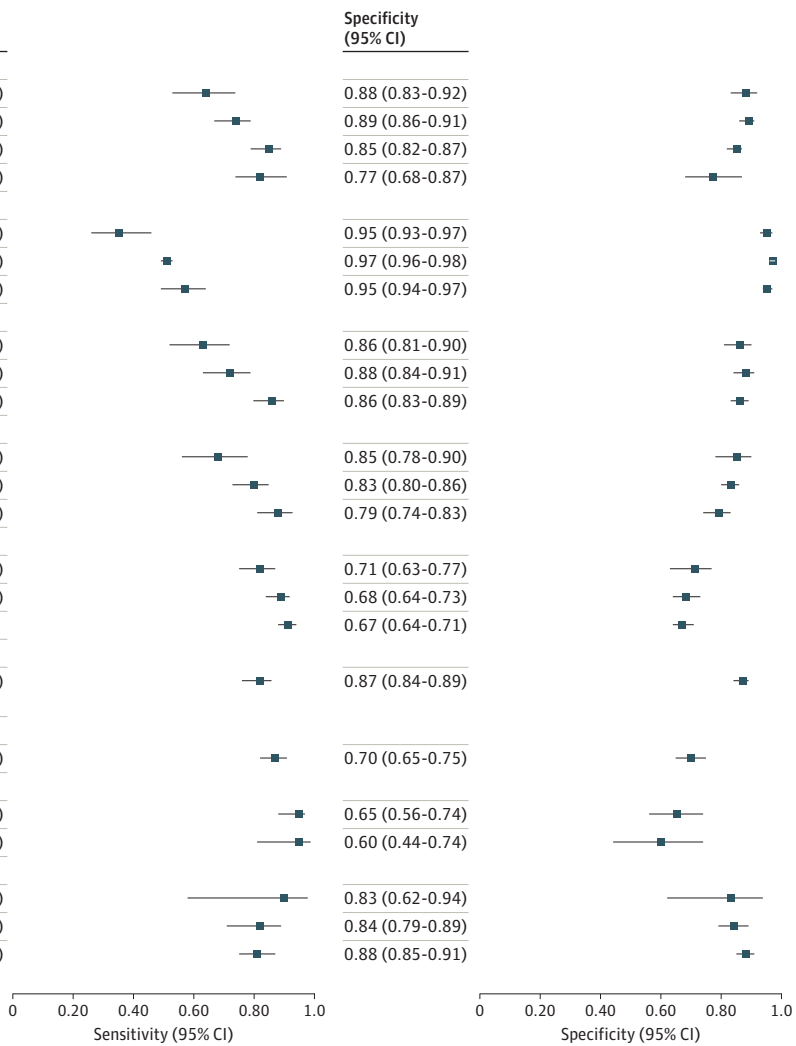
existing systematic reviews covered various versions of the PHQ, 2- and 3-item Whooley screening questions, CES-D, and EPDS. For example, in individual patient data meta-analyses, the PHQ-9 correctly identified 85% of people with major depression and 85% of those without major depression, at the standard cutoff of 10 or greater, when compared with a semistructured interview reference standard (sensitivity, 0.85 [95% CI, 0.79-0.89]; specificity, 0.85 [95% CI, 0.82-0.87]; 47 studies [n = 11 234]) (**Figure 3**; eTable 7 in the Supplement). At the standard cutoff of 2 or greater and when compared with a semistructured interview, the PHQ-2 was more sensitive than the PHQ-9, correctly identifying 91% of people with major depression (sensitivity, 0.91 [95% CI, 0.88-0.94]; 48 studies [n = 11 703]). But specificity at that cutoff was lower, accurately identifying only 67% of people without depression (specificity, 0.67 [95% CI, 0.64-0.71]; 48 studies [n = 11 703]). The Whooley, CES-D, and EPDS demonstrated accuracy comparable with that of the PHQ-2.

The 14 primary studies all covered multiple versions of the GDS; the GDS-15 was the most common. The standard cutoff of 5 or greater had an acceptable balance of sensitivity and specificity. In the pooled analysis combining 7 studies, the GDS-15 accurately identified 94% of people with major depression (sensitivity, 0.94 [95% CI, 0.85-0.98]; I^2 = 85.7%) and 81% of those without (specificity, 0.81 [95% CI, 0.70-0.89]; I^2 = 99.2%) (eFigure 1 and eTable 8 in the Supplement).

Three studies were included that screened for suicidal ideation (eTable 9 in the Supplement).[57-59] Most screening instruments reported sensitivity and specificity above 0.80 for at least 1 reported cutoff (eTable 10 in the Supplement). However, there was no replication of any instrument, and 2 of the 3 studies included only 3 individuals[57] and 12 individuals[59] with suicidal ideation or at very high risk according to the reference standards. The study with the most events was limited to older adults.[58]

Figure 3. Test Accuracy of the PHQ, CES-D, Whooley, and EPDS From Published Systematic Evidence Reviews (Key Question 2)

Source	Reference standard	No. of studies	No. of participants	Cutoff	Sensitivity (95% CI)	Specificity (95% CI)
PHQ-9 Linear						
Negeri et al,[55] 2021	Fully structured diagnostic interview	20	17 167	≥10	0.64 (0.53-0.74)	0.88 (0.83-0.92)
	MINI	33	16 102	≥10	0.74 (0.67-0.79)	0.89 (0.86-0.91)
	Semistructured diagnostic interview	47	11 234	≥10	0.85 (0.79-0.89)	0.85 (0.82-0.87)
Wang et al,[52] 2021 (prenatal)	Fully/semistructured diagnostic interview	3	1465	≥10	0.82 (0.74-0.91)	0.77 (0.68-0.87)
PHQ-9 Algorithm						
He et al,[48] 2020	Fully structured diagnostic interview	13	7577	Original	0.35 (0.26-0.46)	0.95 (0.93-0.97)
	MINI	14	2780	Original	0.51 (0.49-0.53)	0.97 (0.96-0.98)
	Semistructured diagnostic interview	27	6331	Original	0.57 (0.49-0.64)	0.95 (0.94-0.97)
PHQ-8						
Wu et al,[53] 2020	Fully structured diagnostic interview	13	7596	≥10	0.63 (0.52-0.72)	0.86 (0.81-0.90)
	MINI	14	2784	≥10	0.72 (0.63-0.79)	0.88 (0.84-0.91)
	Semistructured diagnostic interview	27	6362	≥10	0.88 (0.80-0.90)	0.86 (0.83-0.89)
PHQ-4						
Harel et al,[54] 2022	Fully structured diagnostic interview	15	12 109	≥4	0.68 (0.56-0.78)	0.85 (0.78-0.90)
	MINI	31	14 870	≥4	0.80 (0.73-0.85)	0.83 (0.80-0.86)
	Semistructured diagnostic interview	29	7719	≥4	0.88 (0.81-0.93)	0.79 (0.74-0.83)
PHQ-2						
Levis et al,[50] 2020	Fully structured diagnostic interview	20	17 319	≥2	0.82 (0.75-0.87)	0.71 (0.63-0.77)
	MINI	32	15 296	≥2	0.89 (0.84-0.92)	0.68 (0.64-0.73)
	Semistructured diagnostic interview	48	11 703	≥2	0.91 (0.88-0.94)	0.67 (0.64-0.71)
PHQ-2 + PHQ-9						
Levis et al,[50] 2020	Semistructured diagnostic interview	44	10 627	≥2 (PHQ-2), ≥10 (PHQ-9)	0.82 (0.76-0.86)	0.87 (0.84-0.89)
CES-D						
Vilagut et al,[51] 2016	Standardized diagnostic interview	22	NR	≥16	0.87 (0.82-0.91)	0.70 (0.65-0.75)
Whooley						
Bosanquet et al,[47] 2015	Diagnostic interview	10	4618	NA	0.95 (0.88-0.97)	0.65 (0.56-0.74)
Smith et al,[56] 2022 (prenatal)	Diagnostic interview	5	1402	NA	0.95 (0.81-0.99)	0.60 (0.44-0.74)
EPDS						
Levis et al,[49] 2020	Fully structured diagnostic interview	4	3188	≥11	0.90 (0.58-0.98)	0.83 (0.62-0.94)
	MINI	18	3302	≥11	0.82 (0.71-0.89)	0.84 (0.79-0.89)
	Semistructured diagnostic interview	36	9066	≥11	0.81 (0.75-0.87)	0.88 (0.85-0.91)



CES-D indicates Center for Epidemiologic Studies Depression scale; EPDS, Edinburgh Postnatal Depression Scale; MINI, Mini International Neuropsychiatric Interview; NA, not applicable; NR, not reported; PHQ, Patient Health Questionnaire.

Harms of Screening

Key Question 3. What are the harms associated with screening for depression or suicide risk in primary care or comparable settings in adults, including pregnant and postpartum persons?

Only 1 depression screening study reported on harms.[25] That study, conducted in Hong Kong among postpartum patients, reported that there were no adverse events in either group. Across all depression screening studies included for KQ1/1a, there was no pattern of effects indicating that screening might paradoxically worsen any outcomes the interventions were aiming to benefit.

For harms of suicide screening, the same short-term study (n = 443) that was included for KQ1 was the only evidence included for assessing the harms of suicide risk screening (ie, a possible increase in suicidal ideation) and indicated no differences between groups (eTable 4 in the Supplement).[32]

Benefits of Treatment

Key Question 4. Does treatment of depression or high suicide risk result in improved health outcomes in adults, including pregnant and postpartum persons?

Thirty-nine existing systematic reviews (reported in 41 publications) of treatment for depression were included; 30 addressed psychological treatment (eTable 11 in the Supplement),[60-88] and 10 addressed pharmacologic treatment (eTable 12 in the Supplement).[81,89-100] Psychological treatment improved depression symptom severity (eFigure 2 in the Supplement). This was the case both in broad analyses that included a wide range of populations and specific interventions and in analyses of some important specific populations, including older adults, perinatal populations, and primary care patients. For example, the broadest analysis, which included any type of psychological treatment compared with any kind of control condition, measuring the depression outcome immediately after treatment (typically 2 to 6 months after baseline), had a standardized mean difference (SMD) of −0.72 (95% CI, −0.78 to −0.67; 385 studies [N not reported but estimated at ≈33 000]),[64] suggesting a moderate to large effect size. When limited to studies in primary care patients, the effect was smaller but statistically significant (SMD, −0.42 [95% CI, −0.56 to −0.29]; 59 studies [N not reported]). Remission and response to treatment (ie, a prespecified level of symptom reduction, such as a certain number of points or a percentage decline relative to baseline score) were more sparsely reported.

Data were limited for populations who were socially or economically disadvantaged or in specific racial or ethnic groups; however, the limited evidence supported benefits of psychological treatment in these populations as well. For example, an analysis of 5 trials among people described as having low socioeconomic status found reduced depressive symptoms at up to 12 weeks after baseline (SMD, −0.66 [95% CI, −0.92 to −0.41]; 5 studies [n = 424]),[81] and a separate analysis found no differences in effect size between studies limited to race or ethnic "minority" populations vs not limited to these population.[66]

For antidepressant medications, pooled effects consistently demonstrated small but statistically significant reductions in depressive symptom severity (eFigure 3 in the Supplement) as well as increased rates of remission (eFigure 4 in the Supplement) and response to treatment (eFigure 5 in the Supplement) in the short term (typically 8 weeks). For example, fluoxetine, which had the largest body of evidence with 117 studies, was associated with a small reduction in symptom severity (SMD, −0.23 [95% CI, −0.28 to −0.19]), a 46% increase in the odds of remission (OR, 1.46 [95% CI, 1.34-1.60]) and a 52% increase in the odds of treatment response (OR, 1.52 [95% CI, 1.40-1.66]; number of studies, number of individuals, and I^2 not reported).[92] Little information was available on the longer-term impact of antidepressants in the synthesized literature, and information was absent or extremely limited on the benefits of pharmacologic treatment among socially or economic disadvantaged or specific racial or ethnic groups. The existing systematic reviews did not report on baseline symptom levels, making it impossible to determine whether the samples in the pharmacotherapy trials were comparable to those in the trials of psychological treatment.

Twenty-three RCTs (reported in 36 articles [n = 22 632]) of suicide prevention among people at increased risk of suicide were included (eTable 13 in the Supplement).[101-136] One study examined the impact of a pharmacologic intervention (lithium),[132] and the remaining studies examined psychological treatment interventions, along with usual mental health care. The impact of the interventions on suicide deaths could not be determined, with only 1 death reported in the included studies. One large (n = 18 882) good-quality multisite trial conducted in US integrated care settings tested 2 suicide prevention interventions among adults with an elevated risk for suicide based on item 9 of the PHQ-9.[135] That study found that, compared with usual care, a care management intervention had no impact on the rate of suicide attempts (hazard ratio, 1.07 [97.5% CI, 0.84 to 1.37]; P =.52), and a low-intensity online skills training intervention was associated with an increased risk of suicide attempts (hazard ratio, 1.29 [97.5% CI, 1.02 to 1.64]; P = .02). Most other studies reported 5 or fewer suicide attempts per study group, and the pooled effect was not statistically significant (OR, 0.94 [95% CI, 0.73-1.22]; 12 RCTs [n = 14 573]; I^2 = 11.2%, including only the care management group of the large trial) (**Figure 4**). Usual mental health care was the most common control group and was in some cases enhanced or optimized, so most of the included studies could be considered comparative effectiveness studies.

Harms of Treatment

Key Question 5. What are the harms of treatment of depression or high suicide risk (psychotherapy or pharmacotherapy) in adults, including pregnant and postpartum persons?

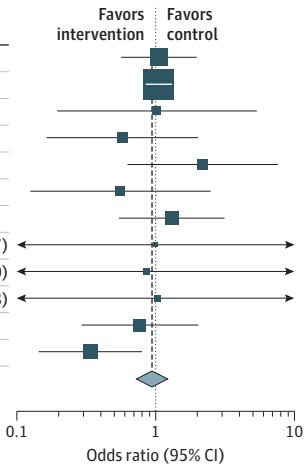
Four existing systematic reviews addressing harms of psychological interventions (eTable 14 in the Supplement) were included.[137-140] Psychological interventions did not increase the risk of harm, as measured by deterioration of depressive symptoms (eTable 15 in the Supplement).

For pharmacologic treatment, 1 cohort study[141] and 22 existing systematic reviews (eTable 16 in the Supplement)[92,95,100,142-159] were included. There was clear evidence that persons receiving antidepressants were at a higher risk of dropout because of adverse events (eFigure 6 in the Supplement). There was also evidence of an increased risk of serious adverse events with use of selective serotonin reuptake inhibitors (OR, 1.39 [95% CI, 1.12-1.72]; 44 RCTs [n = 13 198]; I^2 = 0%) (eFigure 7 in the Supplement).[147] The absolute risk of serious adverse events appears to be relatively low, however, and evidence for specific serious adverse events was very limited. There were too few suicide deaths to determine the association between antidepressant use and suicide death, but both RCT and

Figure 4. Proportion of Participants With a Suicide Attempt From the Suicide Prevention Trials (Key Question 4)

Source	Population	Intervention	Follow-up, wk	No./total (%) Intervention	No./total (%) Control	Odds ratio (95% CI)
Mühlmann et al,[121] 2021	General	CBT	32	22/196 (11.2)	22/206 (10.7)	1.06 (0.57-1.98)
Simon et al,[135] 2022	General	Care management	78	172/6230 (3.3)	162/6187 (3.1)	1.06 (0.85-1.31)
Ward-Ciesielski et al,[131] 2017	General	DBT	12	3/46 (6.5)	3/47 (6.4)	1.02 (0.20-5.35)
van Spijker et al,[128] 2014	General	CBT	6	4/116 (3.4)	7/120 (5.8)	0.58 (0.16-2.02)
Jobes et al,[117] 2017	Military	CAMS	52	8/73 (11.1)	4/75 (5.3)	2.18 (0.63-7.60)
Goodman et al,[115] 2016	Veteran	DBT	26	3/46 (6.5)	5/45 (11.1)	0.56 (0.13-2.49)
Katz et al,[132] 2022	Veteran	Lithium	52	11/225 (4.3)	10/264 (3.8)	1.31 (0.54-3.13)
Riblet et al,[134] 2022	Veteran	Other	13	0/10 (0.0)	0/10 (0.0)	1.00 (0.02-55.27)
Bruce et al,[107] 2004	Older	Care management	52	1/221 (0.4)	1/191 (0.5)	0.86 (0.05-13.90)
Pistorello et al,[124] 2012	College	DBT	26	1/31 (4.5)	1/32 (4.0)	1.03 (0.06-17.28)
Davidson et al,[112] 2006	With BPD	CBT	52	18/48 (37.0)	21/53 (46.0)	0.77 (0.29-2.03)
Linehan et al,[119] 2006	With BPD	DBT	104	12/52 (23.1)	23/49 (46.7)	0.34 (0.14-0.80)
Overall						0.94 (0.73-1.22)

Heterogeneity: $\tau^2 = 0.02$; $I^2 = 11.17\%$, $H^2 = 1.13$
Test of $\Theta = 0$: $t(11) = -0.50$, $P = .62$



The size of the data markers indicates the weight of each study in the analysis. BPD indicates bipolar disorder; CAMS, Collaborative Assessment and Management of Suicidality; CBT, cognitive behavioral therapy; DBT, dialectical behavioral therapy.

observational evidence supported a small absolute increase in risk of suicide attempts with second-generation antidepressant use among adults up to age 65 years (eFigure 8 in the Supplement). For example, a review of US Food and Drug Administration regulatory data indicated a 53% increase in the odds of a suicide attempt at post-treatment evaluation with the use of second-generation antidepressants (OR, 1.53 [95% CI, 1.09-2.15]; n = 41 861); 0.7% of antidepressant users had a suicide attempt vs 0.3% of placebo users.[160] Evidence on other outcomes was limited and generally included only observational evidence, including harms of pharmacotherapy in pregnant or postpartum people.

Two of the included RCTs of suicide prevention treatment reported on harms.[106,132] There were no differences between groups at follow-up on an instrument designed to assess the perceived level of coercion experienced by service users during hospital admission.[106,132] There was no pattern of effect in the studies included for KQ4 to indicate paradoxical harms of treatment. The study of lithium found a higher rate of nonserious adverse events (75.7% with lithium, 69.0% with placebo; *P* value not reported), and a slightly higher rate of serious adverse events (38.8% with lithium, 34.1% with placebo; *P* value not reported) but no difference in withdrawals due to adverse events (1.2% with lithium, 1.5% with placebo, *P* value not reported).[132]

Discussion

Direct evidence indicated that screening programs improved depression outcomes. In addition, robust indirect evidence exists that screening tools feasible to administer in primary care settings have reasonable accuracy and that treatment is effective (**Table 2**). The direct evidence is more equivocal than the indirect evidence, being based on a smaller number of studies and having fewer statistically significant findings. The presence of additional program components beyond screening in many of the depression screening studies made it difficult to isolate the specific effects of screening alone in these studies.

Both the direct and indirect evidence on screening for suicide risk was extremely limited, and the indirect evidence indicated that implementation of some interventions that are feasible for widespread use in health care systems may either have no impact on suicide attempts or paradoxically increase the risk of a suicide attempt. However, the treatment evidence was predominantly compared with usual specialty mental health care, making it difficult to understand the absolute treatment effects. Unlike the previous review, the current review did not include treatment studies in persons seeking treatment in urgent or emergency settings, due to their low applicability to screening in primary care settings; however, the conclusions of the current review are consistent with those from the previous review.

Screening for Depression

The direct evidence for the benefits of screening for depression was very similar to that in the previous review, with only 2 new studies added.[28,31] Trials in general primary care populations and in perinatal populations in particular demonstrate increased rates of depression remission or falling below a specified symptom severity level after 6 to 12 months. The evidence in older adult populations was more limited and did not show a clear benefit but also had some important limitations. Chiefly, only 4 studies examined screening in older adults, and only 1 used a depression measure specifically designed for older adults.[23] This is important because some somatic and sleep-related symptoms of depression are common in older adults without depression. There is ample evidence that screening instruments can identify people with major depressive disorder with reasonable accuracy, and cutoffs could be optimized for specific local settings and populations. Further, a large cohort study showed that disparities in screening rates between Black and other English-speaking primary care patients were eliminated after implementation of a routine screening

Table 2. Summary of Evidence: Depression and Suicide Risk Screening

Condition	No. of studies (No. randomized)	Summary of findings	Consistency and precision	Other limitations	Strength of evidence	Applicability
KQ1: Benefits of screening						
Depression	14 RCTs, 3 CCTs (n = 18 437)	Evidence supported the benefits of screening for depression; eg, at 6 mo postbaseline or 6 mo postpartum (or the closest follow-up time point to 6 mo): Prevalence of depression or clinically important symptomatology: OR, 0.60 (95% CI, 0.50 to 0.73); 8 studies (n = 10 244); I^2 = 0% Remission or falling below a specific level of depression symptomatology: OR, 1.58 (95% CI, 1.23 to 2.02); 8 studies (n = 2302); I^2 = 0% However, no clear benefit in symptom severity measures was found (pooled mean difference in change, −1.0 [95% CI, −2.3 to 0.3]; 9 studies [n = 5543]; I^2 = 74.4%)	Reasonably consistent, reasonably precise	Few studies with unscreened control groups and limited capacity for conducting such studies as screening for depression becomes the standard of care; heterogeneity in interventions and limited evidence on screening without further practice supports	Moderate for benefit	Most studies either conducted outside the US or, among US-based studies, published >15 years ago Applicability to current US health care systems unclear
Suicide risk	1 RCT (n = 443)	Among primary care patients who screened positive for depression, there was 1 suicide attempt after 2 weeks; there were no group differences on any of 3 items measuring suicidal ideation	Consistency NA, imprecise	Single study, very short-term follow-up, limited to people who screened positive for depression	Insufficient	Conducted in the UK and limited to people with symptoms of depression
KQ2: Accuracy of screening tools						
Depression	10 Existing systematic reviews (≈196 studies [n ≈ 75 000]) 14 Test accuracy studies (n = 8819)	Adequate sensitivity and specificity for the PHQ Linear, PHQ-8, PHQ-2, Whooley questions, CES-D, EPDS, and GDS	Consistent, precise	Most of the existing systematic reviews were not restricted to primary care populations	High	Most of the studies were not conducted in the US
Suicide risk	3 Test accuracy studies (n = 1751)	GDS-15, GDS–Suicide Ideation, and the SDDS-PC had adequate test accuracy to detect suicidal ideation	Consistency NA, precision NA	Not replicated in more than 1 study	Insufficient	All studies conducted in the US, 2 in primary care
KQ3: Harms of screening						
Depression	Directly assessed harms: 1 (n = 642) Indirectly used to infer harms: 14 RCTs, 3 CCTs (n = 18 437)	One study reported no adverse events in either group Studies included for KQ1 did not show a pattern of results indicating harmful impact	Consistent, imprecise	Adverse events rarely directly assessed	Moderate for little to no harm	Most studies either conducted outside the US or, among US-based studies, published >15 years ago Applicability to current US health care systems unclear
Suicide risk	1 RCT (n = 443)	Two of 3 suicidal ideation items indicated a possible higher risk with screening; however, the findings were inconclusive due to lack of statistical significance and very wide confidence intervals	Consistency NA, imprecise	Single study, very short-term follow-up, limited to people who screened positive for depression	Insufficient	Conducted in the UK and limited to people with symptoms of depression

(continued)

Table 2. Summary of Evidence: Depression and Suicide Risk Screening (continued)

Condition	No. of studies (No. randomized)	Summary of findings	Consistency and precision	Other limitations	Strength of evidence	Applicability
KQ4: Benefits of treatment						
Depression	30 Existing systematic reviews of psychological treatment (≈346 RCTs [n ≈ 45 078]) 10 Existing systematic reviews of pharmacologic treatment (≈522 studies [n ≈ 116 477])	Psychological treatment improved depression and other health outcomes such as anxiety symptoms, hopelessness, quality of life, and functioning The broadest analysis indicated a moderate to large effect on depression (SMD, −0.72 [95% CI, −0.78 to −0.67]; 385 studies [N not reported but estimated at ≈33 000]) The effect was smaller when limited to studies in primary care patients but was clearly statistically significant (SMD, −0.42 [95% CI, −0.56 to −0.29]; 59 studies [N not reported]) Antidepressant medications consistently demonstrated increased rates of remission and response to treatment and small but statistically significant reductions in depressive symptom severity; eg, fluoxetine, which had the largest body of evidence with 117 studies, was associated with a small reduction in symptom severity (SMD, −0.23 [95% CI, −0.28 to −0.19]), a 46% increase in the odds of remission (OR, 1.46 [95% CI, 1.34 to 1.60]), and a 52% increase in the odds of treatment response (OR, 1.52 [95% CI, 1.40 to 1.66]; Ns of studies and individuals included in each specific analysis were not reported, nor were I^2 values)	Consistent, precise	Most existing systematic reviews examined posttreatment outcomes with little information on longer-term follow-up There was evidence of publication or reporting bias; however, effects were still statistically significant after adjusting for these biases Evidence for benefit in a priori populations of interest was limited in the synthesized literature, particularly on the effect of antidepressant medications	High for benefit	Studies recruited from a wide range of community, online, and clinic sources; wide range of countries; effect sizes in subgroup analyses limited to primary care settings tended to be smaller than in broad-based analyses
Suicide risk	23 RCTs (n = 22 632)	A very large (n = 18 882) study conducted in 4 US health care systems found that 2 separate suicide prevention interventions were associated with either no impact on suicide attempts (HR, 1.07 [97.5% CI, 0.84 to 1.37] for a care management intervention) or an increased risk of suicide attempts (HR, 1.29 [97.5% CI, 1.02 to 1.64] for a low-intensity online intervention) Most other studies had very few participants with suicide attempts, and the pooled effect was not statistically significant (OR, 0.94 [95% CI, 0.73 to 1.22]; 12 RCTs [n = 14 573]; I^2 = 11.2%) The impact of psychological interventions (eg, dialectical and cognitive behavioral therapy) on suicide deaths could not be determined due to the small number of events Although there was a small statistically significant benefit for depression symptom severity, there was no clear improvement over usual care for suicidal ideation, self-harm, other mental outcomes, or for emergency or inpatient health care utilization No studies tested a pharmacologic intervention compared with a placebo control	Inconsistent, imprecise	Control groups were typically usual specialty mental health care (enhanced or optimized in some cases) and so may be considered comparative effectiveness studies; some trials had primary aims of broad self-harm reduction (ie, not focused on self-harm with suicidal intent)	Suicide death: insufficient Suicide attempts: moderate that some interventions are associated with no benefit or increased risk of harm compared with usual mental health care Suicidal ideation, depression, other mental health: low for small to no benefit compared with usual specialty mental health care	Fifteen trials conducted in the US; primarily White non-Hispanic participants; studies were required to have identified participants through outpatient or community settings, rather than through emergency or inpatient settings

(continued)

Table 2. Summary of Evidence: Depression and Suicide Risk Screening (continued)

Condition	No. of studies (No. randomized)	Summary of findings	Consistency and precision	Other limitations	Strength of evidence	Applicability
KQ5: Harms of treatment						
Depression	4 Existing systematic reviews of psychological treatment (≈63 RCTs [n ≈ 8476]) 22 Existing systematic reviews of pharmacologic treatment (≈697 studies [n > 9 million]) 1 Cohort study of pharmacologic treatment (n = 358 351)	In 3 existing systematic reviews, deterioration rates were either lower with psychological interventions or did not differ statistically from control groups A separate review among older adults reported that none of the 14 included trials reported safety data Pharmacologic treatment was associated with a higher risk of dropout due to adverse events with all agents examined and a higher risk of serious adverse events with SSRI use (OR, 1.39 [95% CI 1.12 to 1.72]; 44 RCTs [N not reported]; I^2 = 0%) There were too few suicide deaths to determine the association between antidepressant use and suicide death, but both RCT and observational evidence supported an increased risk of suicide attempts with second-generation antidepressant use among adults up to age 65 y (OR, 1.53 [95% CI, 1.09 to 2.15]; n =40 857; 0.7% of antidepressants users vs 0.3% of placebo users) Other outcomes were largely limited to observational evidence	Dropout due to adverse effects: consistent, reasonably precise Suicide attempt: consistent, imprecise Other serious harms: inconsistent, imprecise	Psychological: harms not directly reported Pharmacologic: RCTs underpowered to identify rare serious outcomes, observational studies could not control for important confounders	Psychological: low for little to no harm Pharmacologic: moderate for increased risk of nonserious harms, low for increased risk of serious harm	Population and setting characteristics not reported in the existing systematic reviews
Suicide risk	Directly assessed harms: 2 RCTs (n = 607) Indirectly used to infer harms: 15 RCTs (n = 1994)	Two studies reported on harms There were no differences between groups at follow-up on an instrument designed to assess the perceived level of coercion experienced by service users during hospital admission The study of lithium found a higher rate of nonserious adverse events (75.7% with lithium, 69% with placebo; *P* value not reported) and a slightly higher rates of serious adverse events (38.8% with lithium, 34.1% with placebo; *P* value not reported) but no difference in withdrawals due to adverse events (1.2% with lithium, 1.5% with placebo; *P* value not reported) There was no pattern of effect in the studies included for KQ4 to indicate paradoxical harms of treatment	Consistent, imprecise	Minimal evidence	Low	Fifteen trials conducted in the US; primarily White non-Hispanic participants; studies were required to have identified participants through outpatient or community settings, rather than through emergency or inpatient settings

Abbreviations: CBT, cognitive behavioral therapy; CCT, controlled clinical trial; CES-D, Center for Epidemiologic Studies Depression scale; EPDS, Edinburgh Postnatal Depression Scale; GAD, Generalized Anxiety Disorder scale; GDS, Geriatric Depression Scale; HR, hazard ratio; NA, not applicable; OR, odds ratio; PD, panic disorder; PHQ, Patient Health Questionnaire; RCT, randomized clinical trial; SDDS-PC, Symptom-Driven Diagnostic System for Primary Care; SMD, standardized mean difference; SSRI, selective serotonin reuptake inhibitor.

program in a large health system,[161] suggesting that routine depression screening may promote equitable mental health outcomes across racial and ethnic groups.

In contrast to the findings of the current review, the Canadian Task Force on Preventive Health Care (CTFPHC) does not recommend screening for depression, based on the lack of direct evidence on the benefits and harms of routinely screening asymptomatic adults.[162] The review the CTFPHC recommendation was based on only included studies in which the screening intervention was a normal part of care and that had an unscreened comparison group. Thus, only 3 of the 17 screening studies included in the current review could have met the Canadian task force's inclusion criteria and were published at the time the CTFPHC review was conducted, and only 1 of these was explicitly listed as examined[19] and excluded from the review. The study excluded from the CTFPHC review did not integrate screening into the normal care process; instead, screening was undertaken by study staff. In addition, the CTFPHC stated that it "had concerns about the potential harms of screening (e.g. false positive, unnecessary treatment, labelling and stigma) and appropriate use of limited resources."

Screening for Suicide Risk

Suicide prevention efforts have the potential to save many US lives, and according to the Centers for Disease Control and Prevention, success in preventing suicide is most likely if addressed at multiple levels and in multiple sectors.[163] While there is likely an important role for health care settings, only 1 trial reporting direct evidence on suicide risk screening among primary care patients was found, and it was limited to patients who had screened positive for depression.[32] The findings were inconclusive. This review was scoped to include evidence on screening in broad populations (not only those who screen positive for depression), but no such evidence was found. In addition, there was minimal evidence on the test performance of suicide risk screening instruments; no instrument was addressed in more than 1 study. However, since many depression screening instruments include a suicide risk question, suicide risk screening often occurs in the context of real-world depression screening.

Studies without control groups (and therefore excluded from the current review) have indicated that asking adults about suicidality in mental health settings does not increase suicidality.[126,164,165] Similarly, a randomized trial among adults with borderline personality disorder comparing frequent and repeated mental health assessment (5 times per day initially, then daily, then weekly), with or without items assessing suicidal ideation, found no increase in suicidal thoughts or behaviors with suicide-related screening compared with mental health screening without suicide-related items.[166] Some health care systems have implemented suicide risk screening in primary care settings, without reports of harms. These include the US Department of Veterans Affairs system, which recommends using the PHQ-9 (which includes a suicide-related item),[167] and the Chickasaw Nation Departments of Health and Family Services,[168] which recommends administering the full PHQ-9 to people who screen positive on the PHQ-2.

Qualitative patient interviews among people who screened positive for depression in primary care settings indicated that being asked about suicidal thoughts felt appropriate and valuable, given the context of the positive depression screen result.[169] One theme that emerged, however, was difficulty answering the PHQ-9 item about suicide ("Thoughts that you would be better off dead, or thoughts of hurting yourself in some way"), since some felt that while they thought about suicide or wishing they were dead, they felt strongly that they would never attempt suicide. Other themes included weighing the hope for help against fears of negative consequences (eg, loss of autonomy or feelings of shame), the importance of a trusting relationship with the clinician, and the value of the clinician's willingness to listen without judgement.

Other potential harms of screening for suicide risk in primary care settings have been observed or postulated. For example, there are documented cases in which insurers have denied medical coverage for health care associated with suicide attempts,[170,171] and having a positive suicide risk screen result may increase the risk that some types of injuries could be interpreted as suicide attempts. Similarly, life insurance payouts could potentially be affected by findings of increased suicide risk in medical records, since most policies do not pay out for suicide deaths in the first 2 years of coverage.[172,173] Thus, a screening result in the medical record indicating an elevated risk of suicide could result in serious financial implications for people who struggle with mental health issues and their families.

Mental Health Equity Across Racial and Ethnic Groups

We found minimal information on the effects of mental health screening in traditionally underserved patient groups, including Black, Latino, and Native American adults. Evaluating the effectiveness of depression and suicide risk screening in these groups is particularly important because of the high burden of depression in these communities and because they may be at elevated risk of misdiagnosis or barriers to treatment. Racism and discriminatory policies in the US have adversely affected the mental and economic well-being of these communities.[174-181] The health care system has contributed to these inequities through bias in diagnosis, even if inadvertent, and by tolerating differential barriers to receiving appropriate treatment. For example, compared with White patients, misdiagnosis of mental health conditions appears to be more common in Black and Hispanic/Latino patients,[182-184] who are also less likely to receive mental health services than Asian American or White patients.[185,186] The cost of treatment and lack of insurance are among the main barriers to receiving mental health services,[187] and in the US these barriers tend to have a greater impact on Black persons and other racial and ethnic groups than on White persons, since racism and structural policies in the US have contributed to large inequities in wealth.[178]

Limitations

This review had several limitations. First, it excluded studies in narrow populations with findings that were not widely applicable to screening in primary care settings. For example, we did not include studies limited to persons with physical or developmental disabilities or to people with medical or other mental health comorbidities such as heart disease, cancer, substance use disorders, bipolar disorder, or posttraumatic stress disorder. Second, similarly, the screening instruments selected for review may not apply to some important groups of patients, such as those with low literacy, low health literacy, limited verbal language, or patients who do not speak English.

Third, there remains uncertainty about the benefits of depression screening in older adults, and studies are needed that report outcomes using instruments specifically designed for older adults, and both short-term (<6 months) and long-term (≥2 years) outcomes.

Fourth, there are also limitations to understanding of the direct impact of screening relative to other depression management supports. As depression screening becomes the standard of care, this is increasingly difficult to study. Nevertheless, rigorous examinations of implementation programs are needed that report the percentage of patients being screened, referred, and treated. These examinations should also report patient health outcomes, such as depression symptoms and quality of life, prior to program implementation and in control clinics.

Fifth, in addition, more research is needed to understand the impact of depression screening and the most appropriate screening tools to use among Asian American, Black, Hispanic/Latino, and Native American/Alaska Native communities. Native American/Alaska Native communities were not represented in the included studies, despite disproportionately high depression prevalence. Similarly, more information is needed on screening in other underrepresented groups such as gender-nonconforming, immigrant, and non–English-speaking patients. Research is also needed on whether implicit bias among primary care clinicians is associated with lower likelihood of screening some patients or the likelihood of appropriate diagnosis and treatment.

The evidence base to support broad suicide screening in primary care settings is extremely limited. Foundational research is needed in primary care populations, including determining which tools should be used and how screening should be implemented. For example, research needs to examine what training is needed and for whom, what system-level supports are needed, and how to minimize the risk of harms, such as feeling judged or stigmatized, feeling that a cry for help was ignored, or experiencing unnecessary loss of autonomy. The National Institute of Mental Health has called for research examining the use of the Zero Suicide approach, which could also help support a USPSTF screening recommendation if conducted in primary care settings.

Conclusions

Evidence supported depression screening in primary care settings, including during pregnancy and postpartum. There are numerous important gaps in the evidence for suicide risk screening in primary care settings.

ARTICLE INFORMATION

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Concept and design: All authors.
Acquisition, analysis, or interpretation of data: O'Connor, Perdue, Coppola, Henninger, Gaynes.
Drafting of the manuscript: O'Connor, Coppola, Henninger, Gaynes.
Critical revision of the manuscript for important intellectual content: Perdue, Henninger, Thomas, Gaynes.
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REFERENCES

1. Substance Abuse and Mental Health Services Administration. *Key Substance Use and Mental Health Indicators in the United States: Results From the 2019 National Survey on Drug Use and Health*. US Department of Health and Human Services; 2020. HHS publication PEP20-07-01-001, NSDUH series H-55.

2. Stone DM, Jones CM, Mack KA. Changes in suicide rates—United States, 2018-2019. *MMWR Morb Mortal Wkly Rep*. 2021;70(8):261-268. doi:10.15585/mmwr.mm7008a1

3. *Web-based Injury Statistics Query and Reporting System (WISQARS) Injury Mortality Reports, 2017*. Centers for Disease Control and Prevention; 2019.

4. US Preventive Services Task Force. Screening for depression in adults: US Preventive Services Task Force recommendation statement. *JAMA*. 2016;315(4):380-387. doi:10.1001/jama.2015.18392

5. LeFevre ML; US Preventive Services Task Force. Screening for suicide risk in adolescents, adults, and older adults in primary care: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2014;160(10):719-726. doi:10.7326/M14-0589

6. US Preventive Services Task Force Procedure Manual. US Preventive Services Task Force. Published 2021. Accessed May 2, 2023. https://www.uspreventiveservicestaskforce.org/uspstf/about-uspstf/methods-and-processes/procedure-manual

7. O'Connor E, Henninger M, Perdue LA, Coppola EL, Thomas R, Gaynes BN. *Screening for Depression, Anxiety, and Suicide Risk in Adults: A Systematic Evidence Review for the US Preventive Services Task Force. Evidence Synthesis No. 223*. Agency for Healthcare Research and Quality; 2023. AHRQ publication 22-05295-EF-1.

8. O'Connor E, Rossom RC, Henninger M, et al. *Screening for Depression in Adults: An Updated Systematic Evidence Review for the US Preventive Services Task Force*. Agency for Healthcare Research and Quality. Published 2016. Accessed May 3, 2023. https://www.ncbi.nlm.nih.gov/books/NBK349027/

9. O'Connor E, Gaynes BN, Burda BU, Soh C, Whitlock EP. Screening for and treatment of suicide

risk relevant to primary care: a systematic review for the US Preventive Services Task Force. *Ann Intern Med*. 2013;158(10):741-754. doi:10.7326/0003-4819-158-10-201305210-00642

10. Vlenterie R, van Gelder MMHJ, Anderson HR, et al. Associations between maternal depression, antidepressant use during pregnancy, and adverse pregnancy outcomes: an individual participant data meta-analysis. *Obstet Gynecol*. 2021;138(4):633-646. doi:10.1097/AOG.0000000000004538

11. Pollock M, Fernandes RM, Newton AS, Scott SD, Hartling L. A decision tool to help researchers make decisions about including systematic reviews in overviews of reviews of healthcare interventions. *Syst Rev*. 2019;8(1):29. doi:10.1186/s13643-018-0768-8

12. Raudenbush SW. Analyzing effect sizes: random-effects models. In: Cooper H, Hedges LV, Valentine JC, eds. *The Handbook of Research Synthesis and Meta-Analysis*. 2nd ed. Russell Sage Foundation; 2009:296-314.

13. Knapp G, Hartung J. Improved tests for a random effects meta-regression with a single covariate. *Stat Med*. 2003;22(17):2693-2710. doi:10.1002/sim.1482

14. DerSimonian R, Laird N. Meta-analysis in clinical trials. *Control Clin Trials*. 1986;7(3):177-188. doi:10.1016/0197-2456(86)90046-2

15. Bergus GR, Hartz AJ, Noyes R Jr, et al. The limited effect of screening for depressive symptoms with the PHQ-9 in rural family practices. *J Rural Health*. 2005;21(4):303-309. doi:10.1111/j.1748-0361.2005.tb00099.x

16. Jarjoura D, Polen A, Baum E, Kropp D, Hetrick S, Rutecki G. Effectiveness of screening and treatment for depression in ambulatory indigent patients. *J Gen Intern Med*. 2004;19(1):78-84. doi:10.1111/j.1525-1497.2004.21249.x

17. Rost K, Nutting P, Smith J, Werner J, Duan N. Improving depression outcomes in community primary care practice: a randomized trial of the quEST intervention. *J Gen Intern Med*. 2001;16(3):143-149. doi:10.1111/j.1525-1497.2001.00537.x

18. Wells KB, Sherbourne C, Schoenbaum M, et al. Impact of disseminating quality improvement programs for depression in managed primary care: a randomized controlled trial. *JAMA*. 2000;283(2):212-220. doi:10.1001/jama.283.2.212

19. Williams JW Jr, Mulrow CD, Kroenke K, et al. Case-finding for depression in primary care: a randomized trial. *Am J Med*. 1999;106(1):36-43. doi:10.1016/S0002-9343(98)00371-4

20. Bijl D, van Marwijk HWJ, Ader HJ, Bekkman AT, de Haan M. A randomised controlled trial to improve the recognition, diagnosis and treatment of major depression in elderly people in general practice—primary and secondary outcomes of the West Friesland Study. *Prim Care Psychiatry*. 2003;8(4):135-140.

21. Callahan CM, Hendrie HC, Dittus RS, Brater DC, Hui SL, Tierney WM. Improving treatment of late life depression in primary care: a randomized clinical trial. *J Am Geriatr Soc*. 1994;42(8):839-846. doi:10.1111/j.1532-5415.1994.tb06555.x

22. van der Weele GM, de Waal MW, van den Hout WB, et al. Effects of a stepped-care intervention programme among older subjects who screened positive for depressive symptoms in general practice: the PROMODE randomised controlled trial. *Age Ageing*. 2012;41(4):482-488. doi:10.1093/ageing/afs027

23. Whooley MA, Stone B, Soghikian K. Randomized trial of case-finding for depression in elderly primary care patients. *J Gen Intern Med*. 2000;15(5):293-300. doi:10.1046/j.1525-1497.2000.04319.x

24. Glavin K, Smith L, Sørum R, Ellefsen B. Redesigned community postpartum care to prevent and treat postpartum depression in women—a one-year follow-up study. *J Clin Nurs*. 2010;19(21-22):3051-3062. doi:10.1111/j.1365-2702.2010.03332.x

25. Leung SS, Leung C, Lam TH, et al. Outcome of a postnatal depression screening programme using the Edinburgh Postnatal Depression Scale: a randomized controlled trial. *J Public Health (Oxf)*. 2011;33(2):292-301. doi:10.1093/pubmed/fdq075

26. MacArthur C, Winter HR, Bick DE, et al. Effects of redesigned community postnatal care on womens' health 4 months after birth: a cluster randomised controlled trial. *Lancet*. 2002;359(9304):378-385. doi:10.1016/S0140-6736(02)07596-7

27. Morrell CJ, Slade P, Warner R, et al. Clinical effectiveness of health visitor training in psychologically informed approaches for depression in postnatal women: pragmatic cluster randomised trial in primary care. *BMJ*. 2009;338:a3045. doi:10.1136/bmj.a3045

28. van der Zee-van den Berg AI, Boere-Boonekamp MM, Groothuis-Oudshoorn CGM, IJzerman MJ, Haasnoot-Smallegange RME, Reijneveld SA. Post-up study: postpartum depression screening in well-child care and maternal outcomes. *Pediatrics*. 2017;140(4):1-8. doi:10.1542/peds.2017-0110

29. Wickberg B, Tjus T, Hwang P. Using the EPDS in routine antenatal care in Sweden: a naturalistic study. *J Reprod Infant Psychol*. 2005;23(1):33-41. doi:10.1080/02646830512331330956

30. Yawn BP, Dietrich AJ, Wollan P, et al; TRIPPD Practices. TRIPPD: a practice-based network effectiveness study of postpartum depression screening and management. *Ann Fam Med*. 2012;10(4):320-329. doi:10.1370/afm.1418

31. Kroenke K, Talib TL, Stump TE, et al. Incorporating PROMIS symptom measures into primary care practice—a randomized clinical trial. *J Gen Intern Med*. 2018;33(8):1245-1252. doi:10.1007/s11606-018-4391-0

32. Crawford MJ, Thana L, Methuen C, et al. Impact of screening for risk of suicide: randomised controlled trial. *Br J Psychiatry*. 2011;198(5):379-384. doi:10.1192/bjp.bp.110.083592

33. Alves Apostolo JL, Bobrowicz-Campos EM, Carvalho dos Reis IA, Justo Henriques S, Veiga Correia CA. Exploring the screening capacity of the European Portuguese version of the 15-item Geriatric Depression Scale. *Rev Psicopatol Psicol Clin*. 2018;23(2):99-107. doi:10.5944/rppc.vol.23.num.2.2018.21050

34. Blank K, Gruman C, Robison JT. Case-finding for depression in elderly people: balancing ease of administration with validity in varied treatment settings. *J Gerontol A Biol Sci Med Sci*. 2004;59(4):378-384. doi:10.1093/gerona/59.4.M378

35. Broekman BF, Niti M, Nyunt MS, Ko SM, Kumar R, Ng TP. Validation of a brief seven-item response bias-free geriatric depression scale. *Am J Geriatr Psychiatry*. 2011;19(6):589-596. doi:10.1097/JGP.0b013e3181f61ec9

36. Davison TE, McCabe MP, Mellor D. An examination of the "gold standard" diagnosis of major depression in aged-care settings. *Am J Geriatr Psychiatry*. 2009;17(5):359-367. doi:10.1097/JGP.0b013e318190b901

37. Eriksen S, Bjørkløf GH, Helvik AS, Larsen M, Engedal K. The validity of the Hospital Anxiety and Depression Scale and the Geriatric Depression Scale-5 in home-dwelling old adults in Norway. *J Affect Disord*. 2019;256:380-385. doi:10.1016/j.jad.2019.05.049

38. Izal M, Montorio I, Nuevo R, Pérez-Rojo G, Cabrera I. Optimising the diagnostic performance of the Geriatric Depression Scale. *Psychiatry Res*. 2010;178(1):142-146. doi:10.1016/j.psychres.2009.02.018

39. Jung YE, Kim MD, Bahk WM, et al. Validation of the Korean version of the Depression in Old Age Scale and comparison with other depression screening questionnaires used in elderly patients in medical settings. *Clin Psychopharmacol Neurosci*. 2019;17(3):369-376. doi:10.9758/cpn.2019.17.3.369

40. Licht-Strunk E, van der Kooij KG, van Schaik DJ, et al. Prevalence of depression in older patients consulting their general practitioner in the Netherlands. *Int J Geriatr Psychiatry*. 2005;20(11):1013-1019. doi:10.1002/gps.1391

41. Marc LG, Raue PJ, Bruce ML. Screening performance of the 15-item Geriatric Depression Scale in a diverse elderly home care population. *Am J Geriatr Psychiatry*. 2008;16(11):914-921. doi:10.1097/JGP.0b013e318186bd67

42. Pellas J, Damberg M. Accuracy in detecting major depressive episodes in older adults using the Swedish versions of the GDS-15 and PHQ-9. *Ups J Med Sci*. 2021;126. doi:10.48101/ujms.v126.7848

43. Rait G, Burns A, Baldwin R, et al. Screening for depression in African-Caribbean elders. *Fam Pract*. 1999;16(6):591-595. doi:10.1093/fampra/16.6.591

44. Shin C, Park MH, Lee SH, et al. Usefulness of the 15-item Geriatric Depression Scale (GDS-15) for classifying minor and major depressive disorders among community-dwelling elders. *J Affect Disord*. 2019;259:370-375. doi:10.1016/j.jad.2019.08.053

45. Stefan AM, Baban A. The Romanian version of the Geriatric Depression Scale: reliability and validity. *Cogn Brain Behav*. 2017;21(3):175-187. doi:10.24193/cbb.2017.21.10

46. van Marwijk HW, Wallace P, de Bock GH, Hermans J, Kaptein AA, Mulder JD. Evaluation of the feasibility, reliability and diagnostic value of shortened versions of the geriatric depression scale. *Br J Gen Pract*. 1995;45(393):195-199.

47. Bosanquet K, Bailey D, Gilbody S, et al. Diagnostic accuracy of the Whooley questions for the identification of depression: a diagnostic meta-analysis. *BMJ Open*. 2015;5(12):e008913. doi:10.1136/bmjopen-2015-008913

48. He C, Levis B, Riehm KE, et al. The accuracy of the Patient Health Questionnaire-9 algorithm for screening to detect major depression: an individual participant data meta-analysis. *Psychother Psychosom*. 2020;89(1):25-37. doi:10.1159/000502294

49. Levis B, Negeri Z, Sun Y, Benedetti A, Thombs BD; DEPRESsion Screening Data

(DEPRESSD) EPDS Group. Accuracy of the Edinburgh Postnatal Depression Scale (EPDS) for screening to detect major depression among pregnant and postpartum women: systematic review and meta-analysis of individual participant data. *BMJ*. 2020;371:m4022. doi:10.1136/bmj.m4022

50. Levis B, Sun Y, He C, et al; Depression Screening Data (DEPRESSD) PHQ Collaboration. Accuracy of the PHQ-2 alone and in combination with the PHQ-9 for screening to detect major depression: systematic review and meta-analysis. *JAMA*. 2020;323(22):2290-2300. doi:10.1001/jama.2020.6504

51. Vilagut G, Forero CG, Barbaglia G, Alonso J. Screening for depression in the general population with the Center for Epidemiologic Studies Depression (CES-D): a systematic review with meta-analysis. *PLoS One*. 2016;11(5):e0155431. doi:10.1371/journal.pone.0155431

52. Wang L, Kroenke K, Stump TE, Monahan PO. Screening for perinatal depression with the Patient Health Questionnaire depression scale (PHQ-9): a systematic review and meta-analysis. *Gen Hosp Psychiatry*. 2021;68:74-82. doi:10.1016/j.genhosppsych.2020.12.007

53. Wu Y, Levis B, Riehm KE, et al. Equivalency of the diagnostic accuracy of the PHQ-8 and PHQ-9: a systematic review and individual participant data meta-analysis. *Psychol Med*. 2020;50(8):1368-1380. doi:10.1017/S0033291719001314

54. Harel D, Levis B, Sun Y, et al; DEPRESsion Screening Data DEPRESSD PHQ Collaboration. External validation of a shortened screening tool using individual participant data meta-analysis: a case study of the Patient Health Questionnaire-Dep-4. *Methods*. 2022;204:300-311. doi:10.1016/j.ymeth.2021.11.005

55. Negeri ZF, Levis B, Sun Y, et al; Depression Screening Data (DEPRESSD) PHQ Group. Accuracy of the Patient Health Questionnaire-9 for screening to detect major depression: updated systematic review and individual participant data meta-analysis. *BMJ*. 2021;375(2183):n2183. doi:10.1136/bmj.n2183

56. Smith RD, Shing JSY, Lin J, Bosanquet K, Fong DYT, Lok KYW. Meta-analysis of diagnostic properties of the Whooley questions to identify depression in perinatal women. *J Affect Disord*. 2022;315:148-155. doi:10.1016/j.jad.2022.07.026

57. Desjardins I, Cats-Baril W, Maruti S, Freeman K, Althoff R. Suicide risk assessment in hospitals: an expert system-based triage tool. *J Clin Psychiatry*. 2016;77(7):e874-e882. doi:10.4088/JCP.15m09881

58. Heisel MJ, Duberstein PR, Lyness JM, Feldman MD. Screening for suicide ideation among older primary care patients. *J Am Board Fam Med*. 2010;23(2):260-269. doi:10.3122/jabfm.2010.02.080163

59. Olfson M, Weissman MM, Leon AC, Sheehan DV, Farber L. Suicidal ideation in primary care. *J Gen Intern Med*. 1996;11(8):447-453. doi:10.1007/BF02599038

60. Aherne D, Fitzgerald A, Aherne C, Fitzgerald N, Slattery M, Whelan N. Evidence for the treatment of moderate depression: a systematic review. *Ir J Psychol Med*. 2017;34(3):197-204. doi:10.1017/ipm.2017.10

61. Castro A, Gili M, Ricci-Cabello I, et al. Effectiveness and adherence of telephone-administered psychotherapy for depression: a systematic review and meta-analysis. *J Affect Disord*. 2020;260:514-526. doi:10.1016/j.jad.2019.09.023

62. Collado A, Lim AC, MacPherson L. A systematic review of depression psychotherapies among Latinos. *Clin Psychol Rev*. 2016;45:193-209. doi:10.1016/j.cpr.2016.04.001

63. Cuijpers P. Four decades of outcome research on psychotherapies for adult depression: an overview of a series of meta-analyses. *Can Psychol*. 2017;58(1):7-19. doi:10.1037/cap0000096

64. Cuijpers P, Karyotaki E, de Wit L, Ebert DD. The effects of fifteen evidence-supported therapies for adult depression: a meta-analytic review. *Psychother Res*. 2020;30(3):279-293. doi:10.1080/10503307.2019.1649732

65. Cuijpers P, Karyotaki E, Reijnders M, Ebert DD. Was Eysenck right after all? a reassessment of the effects of psychotherapy for adult depression. *Epidemiol Psychiatr Sci*. 2019;28(1):21-30. doi:10.1017/S2045796018000057

66. Cuijpers P, Karyotaki E, Reijnders M, Huibers MJH. Who benefits from psychotherapies for adult depression? a meta-analytic update of the evidence. *Cogn Behav Ther*. 2018;47(2):91-106. doi:10.1080/16506073.2017.1420098

67. Cuijpers P, Quero S, Papola D, Cristea IA, Karyotaki E. Care-as-usual control groups across different settings in randomized trials on psychotherapy for adult depression: a meta-analysis. *Psychol Med*. 2021;51(4):634-644. doi:10.1017/S0033291719003581

68. Driessen E, Hollon SD, Bockting CL, Cuijpers P, Turner EH. Does publication bias inflate the apparent efficacy of psychological treatment for major depressive disorder? a systematic review and meta-analysis of US National Institutes of Health–funded trials. *PLoS One*. 2015;10(9):e0137864. doi:10.1371/journal.pone.0137864

69. Harerimana B, Forchuk C, O'Regan T. The use of technology for mental healthcare delivery among older adults with depressive symptoms: a systematic literature review. *Int J Ment Health Nurs*. 2019;28(3):657-670. doi:10.1111/inm.12571

70. Harper Shehadeh M, Heim E, Chowdhary N, Maercker A, Albanese E. Cultural adaptation of minimally guided interventions for common mental disorders: a systematic review and meta-analysis. *JMIR Ment Health*. 2016;3(3):e44. doi:10.2196/mental.5776

71. Holvast F, Massoudi B, Oude Voshaar RC, Verhaak PFM. Non-pharmacological treatment for depressed older patients in primary care: a systematic review and meta-analysis. *PLoS One*. 2017;12(9):e0184666. doi:10.1371/journal.pone.0184666

72. Huang L, Zhao Y, Qiang C, Fan B. Is cognitive behavioral therapy a better choice for women with postnatal depression? a systematic review and meta-analysis. *PLoS One*. 2018;13(10):e0205243. doi:10.1371/journal.pone.0205243

73. Karyotaki E, Ebert DD, Donkin L, et al. Do guided internet-based interventions result in clinically relevant changes for patients with depression? an individual participant data meta-analysis. *Clin Psychol Rev*. 2018;63:80-92. doi:10.1016/j.cpr.2018.06.007

74. Karyotaki E, Riper H, Twisk J, et al. Efficacy of self-guided internet-based cognitive behavioral therapy in the treatment of depressive symptoms: a meta-analysis of individual participant data. *JAMA Psychiatry*. 2017;74(4):351-359. doi:10.1001/jamapsychiatry.2017.0044

75. Letourneau NL, Dennis CL, Cosic N, Linder J. The effect of perinatal depression treatment for mothers on parenting and child development: a systematic review. *Depress Anxiety*. 2017;34(10):928-966. doi:10.1002/da.22687

76. Massoudi B, Holvast F, Bockting CLH, Burger H, Blanker MH. The effectiveness and cost-effectiveness of e-health interventions for depression and anxiety in primary care: a systematic review and meta-analysis. *J Affect Disord*. 2019;245:728-743. doi:10.1016/j.jad.2018.11.050

77. Nair U, Armfield NR, Chatfield MD, Edirippulige S. The effectiveness of telemedicine interventions to address maternal depression: a systematic review and meta-analysis. *J Telemed Telecare*. 2018;24(10):639-650. doi:10.1177/1357633X18794332

78. Nieuwenhuijsen K, Verbeek JH, Neumeyer-Gromen A, Verhoeven AC, Bültmann U, Faber B. Interventions to improve return to work in depressed people. *Cochrane Database Syst Rev*. 2020;10(10):CD006237. doi:10.1002/14651858.CD006237.pub4

79. Pineros-Leano M, Liechty JM, Piedra LM. Latino immigrants, depressive symptoms, and cognitive behavioral therapy: a systematic review. *J Affect Disord*. 2017;208:567-576. doi:10.1016/j.jad.2016.10.025

80. Ponting C, Mahrer NE, Zelcer H, Dunkel Schetter C, Chavira DA. Psychological interventions for depression and anxiety in pregnant Latina and Black women in the United States: a systematic review. *Clin Psychol Psychother*. 2020;27(2):249-265. doi:10.1002/cpp.2424

81. Rojas-García A, Ruiz-Perez I, Rodríguez-Barranco M, Gonçalves Bradley DC, Pastor-Moreno G, Ricci-Cabello I. Healthcare interventions for depression in low socioeconomic status populations: a systematic review and meta-analysis. *Clin Psychol Rev*. 2015;38:65-78. doi:10.1016/j.cpr.2015.03.001

82. Roman M, Constantin T, Bostan CM. The efficiency of online cognitive-behavioral therapy for postpartum depressive symptomatology: a systematic review and meta-analysis. *Women Health*. 2020;60(1):99-112. doi:10.1080/03630242.2019.1610824

83. Thomas WJ, Hauson AO, Lambert JE, et al. A meta-analysis of the effectiveness of cognitive-behavioural therapies for late-life depression. *Can J Couns Psychother*. 2018;52(1):78-117.

84. Weaver A, Himle JA. Cognitive-behavioral therapy for depression and anxiety disorders in rural settings: a review of the literature. *Rural Mental Health*. 2017;41(3):189-221. doi:10.1037/rmh0000075

85. Weitz E, Kleiboer A, van Straten A, Cuijpers P. The effects of psychotherapy for depression on anxiety symptoms: a meta-analysis. *Psychol Med*. 2018;48(13):2140-2152. doi:10.1017/S0033291717003622

86. Xiang X, Wu S, Zuverink A, Tomasino KN, An R, Himle JA. Internet-delivered cognitive behavioral therapies for late-life depressive symptoms:

a systematic review and meta-analysis. *Aging Ment Health*. 2020;24(8):1196-1206. doi:10.1080/13607863.2019.1590309

87. Zhang A, Borhneimer LA, Weaver A, et al. Cognitive behavioral therapy for primary care depression and anxiety: a secondary meta-analytic review using robust variance estimation in meta-regression. *J Behav Med*. 2019;42(6):1117-1141. doi:10.1007/s10865-019-00046-z

88. Zhang A, Franklin C, Jing S, et al. The effectiveness of four empirically supported psychotherapies for primary care depression and anxiety: a systematic review and meta-analysis. *J Affect Disord*. 2019;245:1168-1186. doi:10.1016/j.jad.2018.12.008

89. Arroll B, Chin WY, Martis W, et al. Antidepressants for treatment of depression in primary care: a systematic review and meta-analysis. *J Prim Health Care*. 2016;8(4):325-334. doi:10.1071/HC16008

90. Baune BT, Brignone M, Larsen KG. A network meta-analysis comparing effects of various antidepressant classes on the Digit Symbol Substitution Test (DSST) as a measure of cognitive dysfunction in patients with major depressive disorder. *Int J Neuropsychopharmacol*. 2018;21(2):97-107. doi:10.1093/ijnp/pyx070

91. Boesen K, Paludan-Müller AS, Munkholm K. Network meta-analysis of antidepressants. *Lancet*. 2018;392(10152):1011. doi:10.1016/S0140-6736(18)31783-5

92. Cipriani A, Furukawa TA, Salanti G, et al. Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: a systematic review and network meta-analysis. *Lancet*. 2018;391(10128):1357-1366. doi:10.1016/S0140-6736(17)32802-7

93. Cipriani A, Furukawa TA, Salanti G, et al. Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: a systematic review and network meta-analysis. *Focus (Am Psychiatr Publ)*. 2018;16(4):420-429. doi:10.1176/appi.focus.16407

94. Cuijpers P, de Wit L, Weitz E, Andersson G, Huibers MJ. The combination of psychotherapy and pharmacotherapy in the treatment of adult depression: a comprehensive meta-analysis. *J Evid Based Psychother*. 2015;15(2):147-168.

95. Krause M, Gutsmiedl K, Bighelli I, Schneider-Thoma J, Chaimani A, Leucht S. Efficacy and tolerability of pharmacological and non-pharmacological interventions in older patients with major depressive disorder: a systematic review, pairwise and network meta-analysis. *Eur Neuropsychopharmacol*. 2019;29(9):1003-1022. doi:10.1016/j.euroneuro.2019.07.130

96. Lee Y, Rosenblat JD, Lee J, et al. Efficacy of antidepressants on measures of workplace functioning in major depressive disorder: a systematic review. *J Affect Disord*. 2018;227:406-415. doi:10.1016/j.jad.2017.11.003

97. Lisinski A, Hieronymus F, Näslund J, Nilsson S, Eriksson E. Item-based analysis of the effects of duloxetine in depression: a patient-level post hoc study. *Neuropsychopharmacology*. 2020;45(3):553-560. doi:10.1038/s41386-019-0523-4

98. Munkholm K, Paludan-Müller AS, Boesen K. Considering the methodological limitations in the evidence base of antidepressants for depression: a reanalysis of a network meta-analysis. *BMJ Open*. 2019;9(6):e024886. doi:10.1136/bmjopen-2018-024886

99. Rabinowitz J, Werbeloff N, Mandel FS, Menard F, Marangell L, Kapur S. Initial depression severity and response to antidepressants v. placebo: patient-level data analysis from 34 randomised controlled trials. *Br J Psychiatry*. 2016;209(5):427-428. doi:10.1192/bjp.bp.115.173906

100. Viswanathan M, Middleton JC, Stuebe AM, et al. Maternal, fetal, and child outcomes of mental health treatments in women: a meta-analysis of pharmacotherapy. *Psychiatr Res Clin Pract*. 2021;3(3):123-140. doi:10.1176/appi.prcp.20210001

101. Alexopoulos GS, Reynolds CF III, Bruce ML, et al; PROSPECT Group. Reducing suicidal ideation and depression in older primary care patients: 24-month outcomes of the PROSPECT study. *Am J Psychiatry*. 2009;166(8):882-890. doi:10.1176/appi.ajp.2009.08121779

102. Bao Y, Alexopoulos GS, Casalino LP, et al. Collaborative depression care management and disparities in depression treatment and outcomes. *Arch Gen Psychiatry*. 2011;68(6):627-636. doi:10.1001/archgenpsychiatry.2011.55

103. Barnicot K, Savill M, Bhatti N, Priebe S. A pragmatic randomised controlled trial of dialectical behaviour therapy: effects on hospitalisation and post-treatment follow-up. *Psychother Psychosom*. 2014;83(3):192-193. doi:10.1159/000357365

104. Bogner HR, Joo JH, Hwang S, et al. Does a depression management program decrease mortality in older adults with specific medical conditions in primary care? an exploratory analysis. *J Am Geriatr Soc*. 2016;64(1):126-131. doi:10.1111/jgs.13711

105. Bogner HR, Morales KH, Post EP, Bruce ML. Diabetes, depression, and death: a randomized controlled trial of a depression treatment program for older adults based in primary care (PROSPECT). *Diabetes Care*. 2007;30(12):3005-3010. doi:10.2337/dc07-0974

106. Borschmann R, Barrett B, Hellier JM, et al. Joint crisis plans for people with borderline personality disorder: feasibility and outcomes in a randomised controlled trial. *Br J Psychiatry*. 2013;202(5):357-364. doi:10.1192/bjp.bp.112.117762

107. Bruce ML, Ten Have TR, Reynolds CF III, et al. Reducing suicidal ideation and depressive symptoms in depressed older primary care patients: a randomized controlled trial. *JAMA*. 2004;291(9):1081-1091. doi:10.1001/jama.291.9.1081

108. Bush NE, Smolenski DJ, Denneson LM, Williams HB, Thomas EK, Dobscha SK. A virtual hope box: randomized controlled trial of a smartphone app for emotional regulation and coping with distress. *Psychiatr Serv*. 2017;68(4):330-336. doi:10.1176/appi.ps.201600283

109. Byers AL, Bruce ML, Raue P. Suicidal ideation in non-depressed elderly primary care patients: the PROSPECT study. *Am J Geriatr Psychiatry*. 2009;17:A86.

110. Carter GL, Willcox CH, Lewin TJ, Conrad AM, Bendit N. Hunter DBT project: randomized controlled trial of dialectical behaviour therapy in women with borderline personality disorder. *Aust N Z J Psychiatry*. 2010;44(2):162-173. doi:10.3109/00048670903393621

111. Coyne JC. Interventions for treatment of depression in primary care. *JAMA*. 2004;291(23):2814-2816. doi:10.1001/jama.291.23.2814-a

112. Davidson K, Norrie J, Tyrer P, et al. The effectiveness of cognitive behavior therapy for borderline personality disorder: results from the Borderline Personality Disorder Study of Cognitive Therapy (BOSCOT) trial. *J Pers Disord*. 2006;20(5):450-465. doi:10.1521/pedi.2006.20.5.450

113. Franklin JC, Fox KR, Franklin CR, et al. A brief mobile app reduces nonsuicidal and suicidal self-injury: evidence from three randomized controlled trials. *J Consult Clin Psychol*. 2016;84(6):544-557. doi:10.1037/ccp0000093

114. Gallo JJ, Bogner HR, Morales KH, Post EP, Lin JY, Bruce ML. The effect of a primary care practice-based depression intervention on mortality in older adults: a randomized trial. *Ann Intern Med*. 2007;146(10):689-698. doi:10.7326/0003-4819-146-10-200705150-00002

115. Goodman M, Banthin D, Blair NJ, et al. A randomized trial of dialectical behavior therapy in high-risk suicidal veterans. *J Clin Psychiatry*. 2016;77(12):e1591-e1600. doi:10.4088/JCP.15m10235

116. Harned MS, Jackson SC, Comtois KA, Linehan MM. Dialectical behavior therapy as a precursor to PTSD treatment for suicidal and/or self-injuring women with borderline personality disorder. *J Trauma Stress*. 2010;23(4):421-429. doi:10.1002/jts.20553

117. Jobes DA, Comtois KA, Gutierrez PM, et al. A randomized controlled trial of the collaborative assessment and management of suicidality versus enhanced care as usual with suicidal soldiers. *Psychiatry*. 2017;80(4):339-356. doi:10.1080/00332747.2017.1354607

118. Kovac SH, Range LM. Does writing about suicidal thoughts and feelings reduce them? *Suicide Life Threat Behav*. 2002;32(4):428-440. doi:10.1521/suli.32.4.428.22335

119. Linehan MM, Comtois KA, Murray AM, et al. Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. *Arch Gen Psychiatry*. 2006;63(7):757-766. doi:10.1001/archpsyc.63.7.757

120. McMain SF, Guimond T, Barnhart R, Habinski L, Streiner DL. A randomized trial of brief dialectical behaviour therapy skills training in suicidal patients suffering from borderline disorder. *Acta Psychiatr Scand*. 2017;135(2):138-148. doi:10.1111/acps.12664

121. Mühlmann C, Madsen T, Hjorthøj C, et al. Effectiveness of an internet-based self-help therapy program for suicidal ideation with follow-up at 6 months: results of a randomized controlled trial. *J Clin Psychiatry*. 2021;82(5):31. doi:10.4088/JCP.20m13803

122. Norrie J, Davidson K, Tata P, Gumley A. Influence of therapist competence and quantity of cognitive behavioural therapy on suicidal behaviour and inpatient hospitalisation in a randomised controlled trial in borderline personality disorder: further analyses of treatment effects in the BOSCOT study. *Psychol Psychother*. 2013;86(3):280-293. doi:10.1111/papt.12004

123. Pigeon WR, Funderburk JS, Cross W, Bishop TM, Crean HF. Brief CBT for insomnia delivered in primary care to patients endorsing suicidal ideation: a proof-of-concept randomized clinical trial. *Transl Behav Med*. 2019;9(6):1169-1177. doi:10.1093/tbm/ibz108

124. Pistorello J, Fruzzetti AE, Maclane C, Gallop R, Iverson KM. Dialectical behavior therapy (DBT) applied to college students: a randomized clinical trial. *J Consult Clin Psychol*. 2012;80(6):982-994. doi:10.1037/a0029096

125. Priebe S, Bhatti N, Barnicot K, et al. Effectiveness and cost-effectiveness of dialectical behaviour therapy for self-harming patients with personality disorder: a pragmatic randomised controlled trial. *Psychother Psychosom*. 2012;81(6):356-365. doi:10.1159/000338897

126. Reynolds SK, Lindenboim N, Comtois KA, Murray A, Linehan MM. Risky assessments: participant suicidality and distress associated with research assessments in a treatment study of suicidal behavior. *Suicide Life Threat Behav*. 2006;36(1):19-34. doi:10.1521/suli.2006.36.1.19

127. Thombs BD, Ziegelstein RC. Diabetes, depression, and death: a randomized controlled trial of a depression treatment program for older adults based in primary care (PROSPECT): response to Bogner et al. *Diabetes Care*. 2008;31(6):e54-e54. doi:10.2337/dc08-0446

128. van Spijker BA, van Straten A, Kerkhof AJ. Effectiveness of online self-help for suicidal thoughts: results of a randomised controlled trial. *PLoS One*. 2014;9(2):e90118. doi:10.1371/journal.pone.0090118

129. Van Orden KA, Areán PA, Conwell Y. A pilot randomized trial of engage psychotherapy to increase social connection and reduce suicide risk in later life. *Am J Geriatr Psychiatry*. 2021;29(8):789-800. doi:10.1016/j.jagp.2021.03.009

130. Ward-Ciesielski EF. An open pilot feasibility study of a brief dialectical behavior therapy skills-based intervention for suicidal individuals. *Suicide Life Threat Behav*. 2013;43(3):324-335. doi:10.1111/sltb.12019

131. Ward-Ciesielski EF, Tidik JA, Edwards AJ, Linehan MM. Comparing brief interventions for suicidal individuals not engaged in treatment: a randomized clinical trial. *J Affect Disord*. 2017;222:153-161. doi:10.1016/j.jad.2017.07.011

132. Katz IR, Rogers MP, Lew R, et al; Li+ Plus Investigators. Lithium treatment in the prevention of repeat suicide-related outcomes in veterans with major depression or bipolar disorder: a randomized clinical trial. *JAMA Psychiatry*. 2022;79(1):24-32. doi:10.1001/jamapsychiatry.2021.3170

133. Pistorello J, Jobes DA, Gallop R, et al. A randomized controlled trial of the Collaborative Assessment and Management of Suicidality (CAMS) versus treatment as usual (TAU) for suicidal college students. *Arch Suicide Res*. 2021;25(4):765-789. doi:10.1080/13811118.2020.1749742

134. Riblet NB, Kenneally L, Stevens S, et al. A virtual, pilot randomized trial of a brief intervention to prevent suicide in an integrated healthcare setting. *Gen Hosp Psychiatry*. 2022;75:68-74. doi:10.1016/j.genhosppsych.2022.02.002

135. Simon GE, Shortreed SM, Rossom RC, et al. Effect of offering care management or online dialectical behavior therapy skills training vs usual care on self-harm among adult outpatients with suicidal ideation: a randomized clinical trial. *JAMA*. 2022;327(7):630-638. doi:10.1001/jama.2022.0423

136. Torok M, Han J, McGillivray L, et al. The effect of a therapeutic smartphone application on suicidal ideation in young adults: findings from a randomized controlled trial in Australia. *PLoS Med*. 2022;19(5):e1003978. doi:10.1371/journal.pmed.1003978

137. Cuijpers P, Reijnders M, Karyotaki E, de Wit L, Ebert DD. Negative effects of psychotherapies for adult depression: a meta-analysis of deterioration rates. *J Affect Disord*. 2018;239:138-145. doi:10.1016/j.jad.2018.05.050

138. Ebert DD, Donkin L, Andersson G, et al. Does internet-based guided-self-help for depression cause harm? an individual participant data meta-analysis on deterioration rates and its moderators in randomized controlled trials. *Psychol Med*. 2016;46(13):2679-2693. doi:10.1017/S0033291716001562

139. Jonsson U, Bertilsson G, Allard P, et al. Psychological treatment of depression in people aged 65 years and over: a systematic review of efficacy, safety, and cost-effectiveness. *PLoS One*. 2016;11(8):e0160859. doi:10.1371/journal.pone.0160859

140. Karyotaki E, Kemmeren L, Riper H, et al. Is self-guided internet-based cognitive behavioural therapy (iCBT) harmful? an individual participant data meta-analysis. *Psychol Med*. 2018;48(15):2456-2466. doi:10.1017/S0033291718000648

141. Valuck RJ, Libby AM, Anderson HD, et al. Comparison of antidepressant classes and the risk and time course of suicide attempts in adults: propensity matched, retrospective cohort study. *Br J Psychiatry*. 2016;208(3):271-279. doi:10.1192/bjp.bp.114.150839

142. Braun C, Bschor T, Franklin J, Baethge C. Suicides and suicide attempts during long-term treatment with antidepressants: a meta-analysis of 29 placebo-controlled studies including 6,934 patients with major depressive disorder. *Psychother Psychosom*. 2016;85(3):171-179. doi:10.1159/000442293

143. Chan JYC, Yiu KKL, Kwok TCY, Wong SYS, Tsoi KKF. Depression and antidepressants as potential risk factors in dementia: a systematic review and meta-analysis of 18 longitudinal studies. *J Am Med Dir Assoc*. 2019;20(3):279-286.e1. doi:10.1016/j.jamda.2018.12.004

144. Gibbons RD, Brown CH, Hur K, Davis J, Mann JJ. Suicidal thoughts and behavior with antidepressant treatment: reanalysis of the randomized placebo-controlled studies of fluoxetine and venlafaxine. *Arch Gen Psychiatry*. 2012;69(6):580-587. doi:10.1001/archgenpsychiatry.2011.2048

145. Hengartner MP, Amendola S, Kaminski JA, Kindler S, Bschor T, Plöderl M. Suicide risk with selective serotonin reuptake inhibitors and other new-generation antidepressants in adults: a systematic review and meta-analysis of observational studies. *J Epidemiol Community Health*. Published online March 8, 2021. doi:10.1136/jech-2020-214611

146. Jacobsen PL. *Antidepressant-Associated Sexual Dysfunction in Patients With Depression: A Meta-Analysis of Sexual Functioning Data Collected via Prospective Questionnaires*. Dissertation. Loyola University of Chicago; 2019. Accessed May 3, 2023. https://ecommons.luc.edu/luc_diss/3342/

147. Jakobsen JC, Katakam KK, Schou A, et al. Selective serotonin reuptake inhibitors versus placebo in patients with major depressive disorder: a systematic review with meta-analysis and trial sequential analysis. *BMC Psychiatry*. 2017;17(1):58. doi:10.1186/s12888-016-1173-2

148. Jensen MP, Ziff OJ, Banerjee G, Ambler G, Werring DJ. The impact of selective serotonin reuptake inhibitors on the risk of intracranial haemorrhage: a systematic review and meta-analysis. *Eur Stroke J*. 2019;4(2):144-152. doi:10.1177/2396987319827211

149. Kaminski JA, Bschor T. Antidepressants and suicidality: a re-analysis of the re-analysis. *J Affect Disord*. 2020;266:95-99. doi:10.1016/j.jad.2020.01.107

150. Khanassov V, Hu J, Reeves D, van Marwijk H. Selective serotonin reuptake inhibitor and selective serotonin and norepinephrine reuptake inhibitor use and risk of fractures in adults: a systematic review and meta-analysis. *Int J Geriatr Psychiatry*. 2018;33(12):1688-1708. doi:10.1002/gps.4974

151. KoKoAung E, Cavenett S, McArthur A, Aromataris E. The association between suicidality and treatment with selective serotonin reuptake inhibitors in older people with major depression: a systematic review. *JBI Database Syst Rev Implement Reports*. 2015;13(3):174-205. doi:10.11124/jbisrir-2015-2272

152. Kunutsor SK, Seidu S, Khunti K. Depression, antidepressant use, and risk of venous thromboembolism: systematic review and meta-analysis of published observational evidence. *Ann Med*. 2018;50(6):529-537. doi:10.1080/07853890.2018.1500703

153. Maslej MM, Bolker BM, Russell MJ, et al. The mortality and myocardial effects of antidepressants are moderated by preexisting cardiovascular disease: a meta-analysis. *Psychother Psychosom*. 2017;86(5):268-282. doi:10.1159/000477940

154. Na KS, Jung HY, Cho SJ, Cho SE. Can we recommend mirtazapine and bupropion for patients at risk for bleeding? a systematic review and meta-analysis. *J Affect Disord*. 2018;225:221-226. doi:10.1016/j.jad.2017.08.002

155. Näslund J, Hieronymus F, Lisinski A, Nilsson S, Eriksson E. Effects of selective serotonin reuptake inhibitors on rating-scale-assessed suicidality in adults with depression. *Br J Psychiatry*. 2018;212(3):148-154. doi:10.1192/bjp.2017.24

156. Sobieraj DM, Martinez BK, Hernandez AV, et al. Adverse effects of pharmacologic treatments of major depression in older adults. *J Am Geriatr Soc*. 2019;67(8):1571-1581. doi:10.1111/jgs.15966

157. Trajkova S, d'Errico A, Soffietti R, Sacerdote C, Ricceri F. Use of antidepressants and risk of incident stroke: a systematic review and meta-analysis. *Neuroepidemiology*. 2019;53(3-4):142-151. doi:10.1159/000500686

158. Wang YC, Tai PA, Poly TN, et al. Increased risk of dementia in patients with antidepressants: a meta-analysis of observational studies. *Behav Neurol*. 2018;2018:5315098. doi:10.1155/2018/5315098

159. Gumusoglu SB, Schickling BM, Vignato JA, Santillan DA, Santillan MK. Selective serotonin

reuptake inhibitors and preeclampsia: a quality assessment and meta-analysis. *Pregnancy Hypertens*. 2022;30:36-43. doi:10.1016/j.preghy.2022.08.001

160. Khan A, Fahl Mar K, Gokul S, Brown WA. Decreased suicide rates in recent antidepressant clinical trials. *Psychopharmacology (Berl)*. 2018;235 (5):1455-1462. doi:10.1007/s00213-018-4856-1

161. Garcia MEHL, Hinton L, Neuhaus J, Feldman M, Livaudais-Toman J, Karliner LS. Equitability of depression screening after implementation of general adult screening in primary care. *JAMA Netw Open*. 2022;5(8):e2227658. doi:10.1001/jamanetworkopen.2022.27658

162. Depression in adults (2013): summary of recommendations for clinicians and policy-makers. Canadian Task Force on Preventive Health Care. Published 2013. Accessed March 18, 2022. https://canadiantaskforce.ca/guidelines/published-guidelines/depression/

163. Stone DM, Holland KM, Bartholow B, Crosby AE, Davis S, Wilkins N. *Preventing Suicide: A Technical Package of Policies, Programs, and Practices*. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 2017.

164. Cukrowicz K, Smith P, Poindexter E. The effect of participating in suicide research: does participating in a research protocol on suicide and psychiatric symptoms increase suicide ideation and attempts? *Suicide Life Threat Behav*. 2010;40(6): 535-543. doi:10.1521/suli.2010.40.6.535

165. Lang M, Uttaro T, Caine E, Carpinello S, Felton C. Implementing routine suicide risk screening for psychiatric outpatients with serious mental disorders, II: quantitative results. *Arch Suicide Res*. 2009;13(2):169-177. doi:10.1080/13811110902835106

166. Law MK, Furr RM, Arnold EM, Mneimne M, Jaquett C, Fleeson W. Does assessing suicidality frequently and repeatedly cause harm? a randomized control study. *Psychol Assess*. 2015;27 (4):1171-1181. doi:10.1037/pas0000118

167. Department of Veterans Affairs, Department of Defense. *VA/DoD Clinical Practice Guideline for the Assessment and Management of Patients at Risk for Suicide. Version 2.0-2019*. Department of Veterans Affairs, Department of Defense; 2019.

168. Outcome story: Chickasaw Nation Departments of Health and Family Services. Zero Suicide Institute. Published February 2019. Accessed August 31, 2021. https://zerosuicide.edc.org/evidence/outcome-story/chickasaw-nation-departments-health-and-family-services

169. Richards JE, Hohl SD, Whiteside U, et al. If you listen, I will talk: the experience of being asked about suicidality during routine primary care. *J Gen Intern Med*. 2019;34(10):2075-2082. doi:10.1007/s11606-019-05136-x

170. Andrews M. Despite law, health plans refuse medical claims related to suicide. NPR. February 18, 2014. Accessed October 21, 2021. https://www.npr.org/sections/health-shots/2014/02/18/279014945/despite-law-health-plans-refuse-medical-claims-related-to-suicide

171. Koons C, Tozzi J. As suicides rise, insurers find ways to deny mental health coverage: red tape and a lack of in-network providers frustrate those seeking treatment. Bloomberg Businessweek. May 16, 2019. Accessed October 21, 2021. https://www.bloomberg.com/news/features/2019-05-16/insurance-covers-mental-health-but-good-luck-using-it

172. Lee R. Does life insurance cover death by suicide? Business Insider. Updated September 9, 2021. Accessed January 7, 2023. https://www.businessinsider.com/personal-finance/does-life-insurance-cover-suicide

173. Suicide and Life Insurance. National Alliance on Mental Illness: Minnesota. Published 2021. Accessed May 3, 2023. https://namimn.org/wp-content/uploads/sites/48/2021/06/Life-Insurance-Fact-Sheet-6.1.18.sa_.pdf

174. Bailey RK, Mokonogho J, Kumar A. Racial and ethnic differences in depression: current perspectives. *Neuropsychiatr Dis Treat*. 2019;15: 603-609. doi:10.2147/NDT.S128584

175. Williams DR, Lawrence JA, Davis BA, Vu C. Understanding how discrimination can affect health. *Health Serv Res*. 2019;54(suppl 2):1374-1388. doi:10.1111/1475-6773.13222

176. Bailey ZD, Krieger N, Agénor M, Graves J, Linos N, Bassett MT. Structural racism and health inequities in the USA: evidence and interventions. *Lancet*. 2017;389(10077):1453-1463. doi:10.1016/S0140-6736(17)30569-X

177. Wildeman C, Wang EA. Mass incarceration, public health, and widening inequality in the USA. *Lancet*. 2017;389(10077):1464-1474. doi:10.1016/S0140-6736(17)30259-3

178. McIntosh K, Moss E, Nunn R, Shambaugh J. Examining the Black-white wealth gap. The Brookings Institution. Published February 27, 2020. Accessed May 3, 2023. https://www.brookings.edu/blog/up-front/2020/02/27/examining-the-black-white-wealth-gap/

179. Himmelstein G, Himmelstein KEW. Inequality set in concrete: physical resources available for care at hospitals serving people of color and other US hospitals. *Int J Health Serv*. 2020;50(4):363-370. doi:10.1177/0020731420937632

180. Muramatsu N. County-level income inequality and depression among older Americans. *Health Serv Res*. 2003;38(6 Pt 2):1863-1883. doi:10.1111/j.1475-6773.2003.00206.x

181. Messias E, Eaton WW, Grooms AN. Economic grand rounds: income inequality and depression prevalence across the United States: an ecological study. *Psychiatr Serv*. 2011;62(7):710-712. doi:10.1176/ps.62.7.pss6207_0710

182. Stockdale SE, Lagomasino IT, Siddique J, McGuire T, Miranda J. Racial and ethnic disparities in detection and treatment of depression and anxiety among psychiatric and primary health care visits, 1995-2005. *Med Care*. 2008;46(7):668-677. doi:10.1097/MLR.0b013e3181789496

183. Olbert CM, Nagendra A, Buck B. Meta-analysis of Black vs. White racial disparity in schizophrenia diagnosis in the United States: do structured assessments attenuate racial disparities? *J Abnorm Psychol*. 2018;127(1):104-115. doi:10.1037/abn0000309

184. Strakowski SM, Keck PE Jr, Arnold LM, et al. Ethnicity and diagnosis in patients with affective disorders. *J Clin Psychiatry*. 2003;64(7):747-754. doi:10.4088/JCP.v64n0702

185. Hines AL, Cooper LA, Shi L. Racial and ethnic differences in mental healthcare utilization consistent with potentially effective care: the role of patient preferences. *Gen Hosp Psychiatry*. 2017; 46:14-19. doi:10.1016/j.genhosppsych.2017.02.002

186. Coleman KJ, Stewart C, Waitzfelder BE, et al. Racial-ethnic differences in psychiatric diagnoses and treatment across 11 health care systems in the Mental Health Research Network. *Psychiatr Serv*. 2016;67(7):749-757. doi:10.1176/appi.ps.201500217

187. *Racial/Ethnic Differences in Mental Health Service Use Among Adults*. Substance Abuse and Mental Health Services Administration; 2015.