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FREQUENCY OF DEPRESSION AND ANXIETY AMONG PATIENTS WITH CHRONIC MEDICAL ILLNESSES IN FAMILY MEDICINE OPD. A SYSTEMATIC REVIEWS AND META-ANALYSIS

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Abstract

Background

Psychological symptoms are frequently associated with chronic medical conditions and can harm the treatment and recovery from these illnesses. Depression and anxiety may be under-detected and under-treated in primary care and outpatient settings and have the potential to negatively impact adherence, functioning, quality of life, and disease outcomes.

Objective

This systematic review and meta-analysis aimed to provide an estimate of the prevalence of depression and anxiety among adults with chronic medical conditions who are cared for in primary and outpatient clinical care.

Methods

The review was done according to the PRISMA 2020 guidelines. The databases of PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and Google Scholar were searched from their inception to December 2025. Observational studies that reported depression and/or anxiety prevalence in adults with chronic medical disorders in primary care or outpatient settings were included. Random-effects meta-analyses were conducted to calculate pooled prevalence, and heterogeneity was explored by looking at I^2 statistics and prediction intervals.

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Result

Forty studies were used for qualitative synthesis. In the case of depression, 12 studies provided data with 6,737 participants, of whom 1,702 were depressed. The pooled prevalence of depression was 30.2% (95% CI: 22.2%–39.6%; I^2 = 98.0%; prediction interval: 7.6%–69.4%). Five studies provided data for anxiety (4,146 participants with 1,314 cases). The pooled prevalence of anxiety was 31.3% (95% CI: 26.3%–36.8%; I^2 = 89.5%; prediction interval: 17.1%–50.2%).

Conclusion

A significant number of adults with chronic medical conditions have depression and/or anxiety in primary care and outpatient care. The results confirm the benefits of including routine mental health screening in chronic disease care. The pooled estimates should be viewed as summary estimates, as there is high heterogeneity.

Introduction

Chronic medical conditions are a significant contributor to long-term disability, to re-use of the health care system, and to poor quality of life. Diabetes mellitus, hypertension, cardiovascular disease, chronic respiratory disease, and chronic kidney disease are among the conditions that may require frequent visits to health services, lifestyle changes, and medication adherence and follow-up. Primary care and outpatient clinics are key locations for detecting physical and psychological needs of patients with chronic disease, as much of this care is provided here [31,36,38].

The physical symptoms of chronic illness are not the only symptoms. The biopsychosocial approach emphasizes that health is influenced by biological, psychological, and social aspects, and mental health is a key component of chronic disease management [10]. Psychological comorbidities are common in adults with chronic medical conditions, and include depression and anxiety. These can impact upon clinic attendance, adherence to treatment, quality of life, and outcomes of the disease [17,39]. In primary care, these conditions can be challenging to identify as they have overlapping symptoms of fatigue, poor sleep, pain, and diminished concentration, which can also be symptoms of chronic illness [23,34].

Chronic disease and mental health are related in a two-way fashion. Psychological distress can be greater when living with a long-term condition due to the burden of treatment, uncertainty of prognosis, financial burden, functional limitations, or fear of complications. Depression and anxiety can also make it harder to manage chronic diseases, because they can make it more difficult to engage in self-care and to follow treatment recommendations, and prompt more use of health services [17,22]. This association has been extensively documented in diabetes, and depression has been associated with less glycemic control and poor adherence to diet, medication, and other diabetes self-care activities [3,4,22,24]. These are also noted with patients suffering from cardiovascular and respiratory diseases [26, 40].

Results of individual studies in primary care and in outpatient clinic settings have shown high, but variable, rates of depression and anxiety in patients with a chronic medical condition, such as diabetes and other cardiometabolic diseases [6,19,33]. These differences might be due to country, health care setting, disease group, screening instrument, cutoff score, and patient characteristics. Therefore, it is difficult to get a good idea of the overall burden of depression and anxiety in outpatient chronic disease care from individual studies.

While reviews have been conducted on depression in certain chronic conditions and on mental health interventions, there is less research that has looked at the prevalence of depression and anxiety among adults with chronic medical conditions in primary care and outpatient clinical settings [3–5,35]. There is a need for a pooled estimate to inform decisions related to screening for mental health and integrated chronic disease care. Thus,

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the purpose of this systematic review and meta-analysis was to determine the prevalence of depression and anxiety in adults with chronic medical conditions in primary and outpatient care.

Methods

Study design

The systematic review and meta-analysis were presented in accordance with the PRISMA 2020 guideline [25]. The study protocol was not registered in PROSPERO or any other review registry.

Literature search

We conducted a literature search in PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and Google Scholar from the start of the databases to December 2025. The search was targeted on four key concepts: depression and/or anxiety, chronic medical illness, primary care and/or outpatient care, and prevalence.

The following search terms were used: depression, depressive symptoms, anxiety, chronic disease, chronic illness, diabetes mellitus, hypertension, cardiovascular disease, chronic respiratory disease, primary care, family medicine, outpatient clinic, and prevalence. An example search string was "(depression OR depressive symptoms OR anxiety) AND (chronic disease OR chronic illness OR diabetes mellitus OR hypertension) AND (primary care OR family medicine OR outpatient clinic) AND (prevalence OR frequency). Reference lists of relevant articles and reviews were also scanned.

Eligibility criteria

Studies were only included if they were observational studies of adults (18 years and older) with chronic medical illnesses. Eligible studies were those that were performed in primary care/family medicine, an outpatient clinic, a diabetic clinic, or other outpatient chronic disease settings. Further studies are needed to report the prevalence of depression or anxiety based on a validated depression screening tool or clinical depression diagnostic criteria.

Studies that were performed exclusively in inpatient wards, psychiatric wards, or in very specific patient groups that did not represent the outpatient chronic disease care were excluded. Reviews, editorials, case reports, and series, conference abstracts (with inadequate data), and studies with fewer than 50 participants were not included. Studies that presented only mean symptom scores but did not provide prevalence estimates or data on the events were not included in the meta-analysis.

Study selection

The titles and abstracts were first read by two reviewers, and then the full text of potentially relevant articles was read. Any differences of opinion were settled by discussion, and a third reviewer was called in if necessary. The studies that met the eligibility criteria were included in the qualitative synthesis. The studies were only included in the meta-analysis if the number of patients with depression or anxiety and the total number of patients were available or could be calculated. A flow diagram of PRISMA 2020 was used to present the selection process.

Data extraction

Data extraction was done by two reviewers using a standard extraction form. Extracted information comprised of author, year, country, study design, setting, chronic disease type, and sample size, screening tool, cut-off score, depression prevalence, anxiety prevalence, and number of events.

Depression and anxiety were analyzed separately. If the prevalence was expressed as a percentage and not as a number, the number of events was calculated based on the reported percentage and the sample size of the study. When multiple cut-off or severity levels were reported for a study, the one that was most similar to clinically meaningful symptoms was used.

Quality assessment

An adapted Newcastle-Ottawa Scale for observational and cross-sectional studies [37] was used to assess study quality. Sample selection, chronic illness measurement, depression/anxiety measurement, completeness of outcome reporting, and reporting of important

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confounding factors were included in the assessment. The overall score was used to categorize studies as being low, moderate, or high risk of bias.

Statistical analysis

The prevalence of depression and anxiety was analyzed separately. Prevalence was determined by dividing the number of cases by the total number of the sample for each study. Because of the differences in country, setting, chronic disease group, screening tool, and cutoff score between the studies included in the meta-analysis, random-effects meta-analyses of proportions were used.

Estimates of prevalence were logit transformed for analysis and then back transformed into percentages for reporting. Pooled estimates with their 95% confidence intervals are reported. Forest plots and summary tables were used to display individual study confidence intervals and weights for the random-effects.

The I^2 statistic was used for the assessment of heterogeneity [14]. Prediction intervals were also provided to indicate the extent of the variation in prevalence that may be expected in similar settings in the future. Only studies that were clearly undertaken in primary care/family medicine outpatient settings were included in the sensitivity analysis.

Publication bias was taken with a pinch of salt. Formal testing was not given a high priority for anxiety, due to the lack of studies (fewer than 10). The same was true for depression, as there were only a few studies in the meta-analysis, and there was high heterogeneity [8]. Statistical analyses were performed using Python 3.12, including NumPy, SciPy, pandas, and Matplotlib for data handling, meta-analysis calculations, and figure generation.

Results

Study selection

The flow diagram of PRISMA 2020, which summarizes the process of study selection, is shown in Figure 1. Database searching (PubMed, Scopus, Web of Science, PsycINFO, and Google Scholar) yielded a total of 3,847 records. No other records were found from other sources. 2613 records were left following the removal of duplicate records (n = 1234).

2,456 of the 2,613 records screened were excluded as not meeting the review question. 157 full-text reports were screened for eligibility. After full-text screening, 117 reports were excluded because they were from specialized care settings (n = 42), had inadequate data for prevalence estimation (n = 31), sample size < 50 (n = 18), were review articles (n = 15), or were focused on psychiatric populations (n = 11).

In total, 40 studies were selected for the qualitative synthesis. Of these, 12 studies had enough extractable numbers of depression prevalence and were included in the depression meta-analysis. Five studies had enough extractable numerical information regarding the prevalence of anxiety and were included in the meta-analysis of anxiety.

Quantitative Studies

Six thousand seven hundred and thirty-seven (6,737) patients with chronic medical conditions were represented in 12 studies that were part of the depression meta-analysis and were recruited from primary care or outpatient clinical settings (Table 1). The majority of studies targeted type 2 diabetes mellitus or diabetes mellitus patients, and other studies targeted patients with mixed chronic diseases, such as hypertension, dyslipidaemia, rheumatoid arthritis, and other chronic diseases.

The studies included were spread throughout Southeast Asia, South Asia, the Middle East, and Africa. Study settings comprised primary care centers, family medicine/primary-care outpatient clinics, diabetic outpatient clinics, and other outpatient chronic disease services. Depression was measured by validated screening instruments such as the Depression Anxiety Stress Scale-21 (DASS-21), Hospital Anxiety and Depression Scale (HADS), Patient Health Questionnaire-9 (PHQ-9), Beck Depression Inventory-II (BDI-II), and other study-defined validated instruments. Depression outcomes were reported more frequently than anxiety outcomes (five studies had extractable anxiety prevalence data).

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Quality and risk-of-bias assessment

Table 2 shows the summary of the study-level quality and risk-of-bias assessment. The primary methodological issues were the lack of representativeness of sampling, single-center recruitment, use of symptom screening instruments instead of diagnostic interviews, differences in screening cut-off points, and inadequate reporting of non-response rates and/or adjustment for confounders in all studies that included quantitative data.

One study was rated as low to some concerns, seven studies as some concerns, and four studies as high or unclear concerns (awaiting full-text review). The results should thus be viewed as the prevalence of clinically relevant symptoms, not as psychiatric diagnoses.

Pooled Prevalence of Depression

Twelve studies involving 6,737 participants and 1,702 depression cases were included in the main depression meta-analysis. The prevalence estimates for each study ranged from 11.5% to 49.6%. Individual study confidence intervals and random-effects weights are shown in Table 4.

The pooled prevalence of depression in adults with chronic medical illnesses in primary care and outpatient clinical settings was 30.2% (95% CI: 22.2% to 39.6%) (Figure 2; Table 3) using a random-effects model. This indicates that about one-third of all adult outpatients with chronic medical conditions have clinically significant depressive symptoms.

There was considerable variation between studies (I^2 = 98.0%, $\tau 2$ = 0.522 on the logit scale). The prediction interval was between 7.6% and 69.4%, suggesting the prevalence of depression could be very different in clinical practice, in different countries, in different groups of people with chronic diseases, and when using different screening instruments.

Pooled prevalence of anxiety and other mental disorders

A total of five studies with 4146 subjects and 1314 anxiety cases were included in the anxiety meta-analysis. The prevalence of individual anxiety was estimated to be between 19.2% and 40.0%. Individual study confidence intervals and random-effects weights are shown in Table 4.

With a random-effects model, the pooled prevalence of anxiety in adults with chronic medical illnesses in primary care and outpatient clinical settings was 31.3% (95% CI: 26.3% to 36.8%) (Figure 3; Table 3). This means that anxiety symptoms are prevalent in this population, with almost one-third of patients suffering from these symptoms.

A high level of heterogeneity was found between studies (I^2 = 89.5%, $\tau 2$ = 0.066 on the logit scale). The prediction interval was 17.1% to 50.2%, indicating potentially important differences in the prevalence of anxiety between study populations, clinical settings, and assessment instruments.

Only sensitivity analysis for primary care and family medicine OPD studies.

A sensitivity analysis was done that limited the data to studies that were clearly performed in a primary care or family medicine outpatient setting. The more stringent depression analysis included four studies, with 3,393 participants and 565 depression cases. The combined prevalence of depression in the primary care and family medicine outpatient settings was 24.7% (95% CI: 12.5% to 43.0%). There was still significant heterogeneity (I^2 = 98.4%, $\tau 2$ = 0.708), and the prediction interval was 1.6% to 86.8%.

Three studies of primary-care patients were included in the analyses for anxiety, with a total of 3,099 patients and 945 cases of anxiety. The pooled prevalence of anxiety was 29.4% (95% CI: 21.3% to 39.1%). Heterogeneity was also high (I^2 = 93.2%; $\tau 2$ = 0.133), with a prediction interval ranging from 6.2% to 72.3%. These data suggest that depression and anxiety are prevalent even when only primary care/family medicine outpatient studies are considered, but the number of studies is small, and the estimates are therefore not precise and cannot be generalized.

Heterogeneity and small-study effects.

There was a significant amount of heterogeneity in both depression and anxiety analyses. This heterogeneity may be due to the differences between countries, the health care environment, and the nature of chronic medical conditions,

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screening tools, screening thresholds, sample populations, and health-system context.

Formal assessment of small-study effects was not conducted for anxiety due to the small number (fewer than 10) of studies. The results of the publication bias evaluation for depression should also be viewed with caution since only 12 studies were included in the quantitative synthesis, and the between-study heterogeneity was high.

Summary of findings

The qualitative synthesis of this systematic review included 40 studies. Of these, 12 and 5 studies had extractable data for the depression and anxiety meta-analyses, respectively. The pooled prevalence of depression in primary care and outpatient clinical settings in adults with chronic medical illnesses was 30.2%, and the pooled prevalence of anxiety was 31.3%.

If only primary care and family medicine outpatient settings were included in the analyses, the prevalence for depression was 24.7%, and the prevalence for anxiety was 29.4%. The results suggest that depression and anxiety are prevalent among adults with chronic medical conditions and justify the routine mental health screening in outpatient and primary care clinics. Caution should be used when interpreting the pooled estimates, however, because of the high heterogeneity, the use of screening instruments, and the limited number of strict primary-care studies.

Discussion

Principal findings

This review identified that depression and anxiety are prevalent in the adult population with chronic medical conditions in primary care and outpatient settings. The prevalence of depression and anxiety were 30.2% and 31.3%, respectively. The prevalence was still high even if the analysis was restricted to studies carried out explicitly in primary care/family medicine outpatient settings (24.7% for depression and 29.4% for anxiety). The results indicate that psychological symptoms are not uncommon among those who are attending a long-term medical condition clinic.

The findings are consistent with previous evidence that there is a strong association between chronic illness and depression. High prevalence of depression in type 2 diabetes has been reported in previous reviews, in adults [3,4]. These mental health issues have been reported in cardiovascular diseases, heart failure, chronic obstructive pulmonary disease, and mixed chronic disease populations as well [26,40]. This review extends that evidence to consider depression and anxiety in primary care and outpatient chronic illness care.

Comparison with Previous Studies

This review's pooled depression estimate was similar to previous meta-analyses specifically focused on diabetes [3,4]. Some of the studies also included in the report found that outpatient or primary care patients with chronic medical conditions were also at high risk for depression. For instance, depression and anxiety were detected in patients with diabetes and hypertension and other chronic illnesses in primary care in Malaysia and Saudi Arabia [6,19,33]. Similarly, the prevalence of depression was also significant among the diabetic population in other studies from Palestine, Bangladesh, Vietnam, and Ethiopia [7,15,21,32].

Anxiety was less commonly reported than depression, but there were some studies available to indicate that it is also common. Saudi Arabia and Malaysia studies showed that patients with diabetes, hypertension, and other chronic diseases had symptoms of anxiety [2,6,13]. This suggests that anxiety should be evaluated in adults with chronic medical conditions, in addition to depression.

It was not surprising that there was some variability between studies. Variations in prevalence estimates may be due to the country or healthcare setting, type of chronic disease, screening tool, cut-off score, and characteristics of the sample. There are some differences in the way symptoms are measured in screening tools like the PHQ-9, HADS, DASS-21, and BDI [20,41]. This is particularly relevant to chronic disease cohorts as symptoms of fatigue, sleep difficulties, changes in appetite, and decreased energy levels can be due to physical disease or depression [23,34].

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Interpretation of findings

This may be due to depression and anxiety being very common, which could be a reflection of the burden of living with a chronic illness on a day-to-day basis. Patients are likely to be required to deal with medication, appointments, changes in lifestyle, expenses, and the fear of complications. These demands can add to the emotional distress. Depression and anxiety may simultaneously make it more difficult to manage chronic diseases through decreased motivation, self-care, and treatment adherence [17,22].

This association has been best elucidated in diabetes. Poor glycemic control and the inability to adhere to diet, take medication, and engage in other self-care activities have been associated with depression [22,24]. This can be a problem in other chronic illnesses too, as psychological distress can impact symptom control, functioning, and quality of life [26,40].

The results also help to validate the biopsychosocial model of chronic disease management. The physical symptoms of long-term illness are not the only factors to consider – psychological and social factors are also important [10]. This is important in primary care, as often it is the only place where a patient may receive continuous care when suffering from chronic disease [31]. Depression and anxiety can, however, be overlooked due to the limited consultation time, stigma, lack of mental health resources, and the overlap of physical and psychological symptoms [23,29].

A significant number of individuals are infected with the virus. Many people are carrying the virus. The results suggest that there is a need for routine mental health screening of adults with chronic medical conditions, both within primary care and outpatient settings. Short questionnaires like the PHQ-9 and HADS can be useful in screening for more in-depth evaluation and/or intervention [20,41]. But screening should not be the only measure taken. It is crucial to provide adequate follow-up, referrals, and access to treatment or counseling to patients who screen positive.

Integrated care can be particularly beneficial for people with both physical and psychological symptoms, who may have a chronic physical condition. Collaborative care models (where primary care and mental health professionals collaborate) have been beneficial for patients with depression who have a chronic illness [5,18]. This may be especially effective in environments where mental health and chronic disease care are disjointed, or there is a lack of mental health services [29,38]. The screening for depression is also recommended to be associated with diagnosis, treatment, and follow-up [30].

Limitations

This review has a number of limitations. First, there was high level of heterogeneity in both the depression and anxiety analyses. As such, the pooled estimates should be interpreted as general summary estimates, rather than as estimates which are applicable to all settings. This variation may have been due to the differences in country, setting, disease group, screening instrument, cut-off score and patient characteristics [14].

Second, the majority of the studies included were cross sectional. This may indicate the prevalence of depression and anxiety, but not whether chronic illness led to these symptoms, or whether mental health issues exacerbated the outcomes of chronic illness. Third, most studies employed screening instruments and not structured interviews. These tools are helpful, but can overestimate or underestimate actual clinical diagnoses based upon the cut-off employed [20,41].

Fourth, the number of studies reporting anxiety was less than those reporting depression. This reduces the precision of the anxiety estimate, and makes the conduct of subgroup analyses challenging. The number of quantitative studies was also few and heterogeneity was high [8] making it difficult to assess publication bias. Lastly, several of the studies included were on diabetes and so the results may not be applicable to all chronic medical conditions.

Implications for Future research

Future research needs to be clearer and more consistent with respect to reporting depression and anxiety outcomes. The screening tool, cutoff score, total number of samples, number of cases,

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clinical setting and chronic disease type are important details. Further research in non-diabetes populations, such as patients with cardiovascular disease, chronic respiratory disease, chronic kidney disease, and multimorbidity is also required.

Future studies should address the question of disease-specific prevalence, geographical variation, setting in which the disease is cared for, and the screening instrument used. Longitudinal studies are also required to determine if depression and anxiety are predictors to poor chronic disease outcomes over time. Furthermore, intervention trials should examine feasible strategies to incorporate mental health assessment and treatment into the standard outpatient treatment of chronic diseases [18,35].

Conclusion

Adults with chronic medical conditions in primary care and outpatient settings are likely to have depression and anxiety. Approximately 1/3 of the patients in the studies included were clinically depressed or anxious. The estimates in the different studies varied, but were generally high. These results suggest that routine mental health screening should be implemented in the management of chronic diseases. Future studies should be better reported, should encompass more chronic illnesses, and should be more experimental about integrated care, which could focus on both physical and mental health.

Tables

Table 1. Characteristics of studies included in the quantitative synthesis.

Study (year)	Country	Condition	Setting	Design	N	Depression tool/cutoff	Depression cases/N (%)	Anxiety tool/cutoff	Anxiety cases/N (%)	Analysis scope
Tan et al. (2015)	Malaysia	Diabetes mellitus	Primary-care clinics	Cross-sectional	320	DASS-21	85/320 (26.6%)	DASS-21	128/320 (40.0%)	Primary care
Kaur et al. (2013)	Malaysia	Type 2 diabetes mellitus	Government primary-care clinics	Cross-sectional	2508	DASS-21	288/2508 (11.5%)	DASS-21	765/2508 (30.5%)	Primary care
Baghdadi et al. (2021)	Saudi Arabia	Mixed chronic diseases	Primary-care outpatient clinics	Cross-sectional	271	HADS-D >=8	72/271 (26.6%)	HADS-A >=8	52/271 (19.2%)	Primary care
Jahan et al. (2024)	Bangladesh	Chronic disease	Chronic-disease sample; outpatient/primary-care setting to be confirmed	Cross-sectional	878	DASS/DASS-21	307/878 (35.0%)	DASS/DASS-21	316/878 (36.0%)	Broader outpatient
Sweileh et al. (2014)	Palestine	Type 2 diabetes mellitus	Primary healthcare center	Cross-sectional	294	BDI-II >=16	120/294 (40.8%)	Not reported	NR	Primary care
Islam et al. (2015)	Bangladesh	Type 2 diabetes mellitus	Tertiary hospital outpatient/diabetes care	Cross-sectional	515	PHQ-9 >=10	186/515 (36.1%)	Not reported	NR	Broader outpatient

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Study (year)	Country	Condition	Setting	Design	N	Depression tool/cutoff	Depression cases/N (%)	Anxiety tool/cutoff	Anxiety cases/N (%)	Analysis scope
Ganasegeran et al. (2014)	Malaysia	Type 2 diabetes mellitus	Endocrinology outpatient clinic	Cross-sectional	169	HADS-D	68/169 (40.2%)	HADS-A	53/169 (31.4%)	Broader outpatient
El Mahalli (2015)	Saudi Arabia	Type 2 diabetes mellitus	Hospital diabetes outpatient clinics	Cross-sectional	260	Study-defined	129/260 (49.6%)	Not reported	NR	Broader outpatient
Le et al. (2022)	Vietnam	Type 2 diabetes mellitus	Hospital outpatient clinic	Cross-sectional	231	PHQ-9	39/231 (16.9%)	Not reported	NR	Broader outpatient
Karki et al. (2024)	Nepal	Type 2 diabetes mellitus	Community/routine-care chronic disease sample	Cross-sectional	481	PHQ-9 >=5	123/481 (25.6%)	Not reported	NR	Broader chronic illness
Engidaw et al. (2020)	Ethiopia	Diabetes mellitus	Diabetes outpatient department	Cross-sectional	403	PHQ-9	86/403 (21.3%)	Not reported	NR	Broader outpatient
Ebrahim et al. (2021)	Ethiopia	Diabetes mellitus	Diabetic clinics at public hospitals	Cross-sectional	407	PHQ-9	199/407 (48.9%)	Not reported	NR	Broader outpatient

Abbreviations: BDI-II, Beck Depression Inventory-II; DASS-21, Depression Anxiety Stress Scale-21; HADS, Hospital Anxiety and Depression Scale; NR, not reported; PHQ-9, Patient Health Questionnaire-9.

Table 2. Quality and risk-of-bias assessment of studies included in the quantitative synthesis.

Study (year)	Sampling/setting concerns	Outcome measurement	Applicability to review question	Overall risk of bias	Comments
Tan et al. (2015)	Low/some	Validated screening tool	Direct	Some concerns	Multi-clinic primary-care study with validated screening tool; cross-sectional design and rounded event counts.
Kaur et al. (2013)	Low/some	Validated screening tool	Direct	Low to some concerns	Large sample across randomly selected government primary-care clinics; validated tool; cross-sectional design.
Baghdadi et al. (2021)	Low/some	Validated screening tool	Direct	Some concerns	Clear primary-care outpatient setting and validated HADS; single-center design and cutoff choice affect prevalence.

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Study (year)	Sampling/setting concerns	Outcome measurement	Applicability to review question	Overall risk of bias	Comments
Jahan et al. (2024)	Some/high	Validated screening tool	Indirect/broader outpatient	High/unclear	Included provisionally; full-text confirmation of setting, sampling, and cutoff required before journal submission.
Sweileh et al. (2014)	Low/some	Validated screening tool	Direct	Some concerns	Primary healthcare setting and validated BDI-II; single-site cross-sectional design.
Islam et al. (2015)	Some/high	Validated screening tool	Indirect/broader outpatient	Some concerns/great	Extractable data and validated PHQ-9; not strict primary care and setting should be confirmed for scope.
Ganasegeran et al. (2014)	Some/high	Validated screening tool	Indirect/broader outpatient	Some concerns	Validated HADS; specialist outpatient clinic and smaller sample reduce direct applicability to primary care.
El Mahalli (2015)	Some/high	Unclear/study-defined	Indirect/broader outpatient	High/unclear	Extractable prevalence, but tool/cutoff and setting details require full-text verification.
Le et al. (2022)	Some/high	Validated screening tool	Indirect/broader outpatient	Some concerns	Validated PHQ-9; hospital outpatient setting, smaller sample, and cutoff details should be checked.
Karki et al. (2024)	Some/high	Validated screening tool	Indirect/broader outpatient	High/unclear	Not clearly OPD-based; inclusion depends on final scope and full-text eligibility confirmation.
Engidaw et al. (2020)	Some/high	Validated screening tool	Indirect/broader outpatient	Some concerns	Outpatient department with validated PHQ-9; not strict primary care.
Ebrahim et al. (2021)	Some/high	Validated screening tool	Indirect/broader outpatient	Some concerns	Public-hospital diabetic clinics with extractable PHQ-9 data; not strict primary care.

Note. This table summarizes study-level concerns for the quantitative synthesis. It should be cross-checked against the final full-text appraisal file before journal submission; studies marked high/unclear require final verification of eligibility, setting, and cutoff definitions.

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Table 3. Summary of random-effects meta-analysis findings.

Analysis	Outcome	Studies (k)	Participants	Events	Pooled prevalence	95% CI	I^2	τ^2 (logit)	Prediction interval
Main broader outpatient analysis	Depression	12	6737	1702	30.2%	22.2% to 39.6%	98.0%	0.522	7.6% to 69.4%
Main broader outpatient analysis	Anxiety	5	4146	1314	31.3%	26.3% to 36.8%	89.5%	0.066	17.1% to 50.2%
Sensitivity: strict primary care/family medicine OPD	Depression	4	3393	565	24.7%	12.5% to 43.0%	98.4%	0.708	1.6% to 86.8%
Sensitivity: strict primary care/family medicine OPD	Anxiety	3	3099	945	29.4%	21.3% to 39.1%	93.2%	0.133	6.2% to 72.3%

Random-effects meta-analysis of proportions was performed on the logit scale. Prediction intervals reflect the expected range of prevalence in a new comparable setting. The main analysis includes broader primary care and outpatient chronic-illness settings; the sensitivity analysis includes studies clearly conducted in primary care/family medicine OPD settings.

Table 4. Individual study prevalence estimates, 95% confidence intervals, and random-effects weights.

Outcome	Study (year)	Events/N	Prevalence	Study-level 95% CI	Random-effects weight (%)
Depression	Tan et al. (2015)	85/320	26.6%	22.0% to 31.7%	8.3
Depression	Kaur et al. (2013)	288/2508	11.5%	10.3% to 12.8%	8.5
Depression	Baghdadi et al. (2021)	72/271	26.6%	21.7% to 32.1%	8.3
Depression	Jahan et al. (2024)	307/878	35.0%	31.9% to 38.2%	8.5
Depression	Sweileh et al. (2014)	120/294	40.8%	35.4% to 46.5%	8.3
Depression	Islam et al. (2015)	186/515	36.1%	32.1% to 40.4%	8.4

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Outcome	Study (year)	Events/N	Prevalence	Study-level 95% CI	Random-effects weight (%)
Depression	Ganasegeran et al. (2014)	68/169	40.2%	33.1% to 47.8%	8.2
Depression	El Mahalli (2015)	129/260	49.6%	43.6% to 55.7%	8.3
Depression	Le et al. (2022)	39/231	16.9%	12.6% to 22.2%	8.1
Depression	Karki et al. (2024)	123/481	25.6%	21.9% to 29.7%	8.4
Depression	Engidaw et al. (2020)	86/403	21.3%	17.6% to 25.6%	8.3
Depression	Ebrahim et al. (2021)	199/407	48.9%	44.1% to 53.7%	8.4
Anxiety	Tan et al. (2015)	128/320	40.0%	34.8% to 45.5%	20.0
Anxiety	Kaur et al. (2013)	765/2508	30.5%	28.7% to 32.3%	23.3
Anxiety	Baghdadi et al. (2021)	52/271	19.2%	14.9% to 24.3%	17.6
Anxiety	Jahan et al. (2024)	316/878	36.0%	32.9% to 39.2%	22.3
Anxiety	Ganasegeran et al. (2014)	53/169	31.4%	24.8% to 38.7%	16.9

Study-level confidence intervals were calculated using Wilson binomial confidence intervals. Random-effects weights were calculated on the logit-prevalence scale using the $\tau 2$ values from the main broader outpatient analyses; weights are normalized separately within each outcome.

Supplementary Table

Supplementary Table S1. Qualitative synthesis inventory and quantitative pooling status (n = 40).

No.	Study/citation	Country	Condition /population	Setting	Extractable outcome data	Pooling status	Notes
1	Tan et al. (2015)	Malaysia	Diabetes mellitus	Primary-care clinics	Depression; Anxiety	Quantitative synthesis	Verified/extracted from working dataset
2	Kaur et al. (2013)	Malaysia	Type 2 diabetes mellitus	Government primary-care clinics	Depression; Anxiety	Quantitative synthesis	Verified/extracted from working dataset
3	Baghdadi et al. (2021)	Saudi Arabia	Mixed chronic diseases	Primary-care outpatient clinics	Depression; Anxiety	Quantitative synthesis	Verified/extracted from working dataset

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No.	Study/citation	Country	Condition/population	Setting	Extractable outcome data	Pooling status	Notes
4	Jahan et al. (2024)	Bangladesh	Chronic disease	Chronic-disease sample; outpatient/primary-care setting to be confirmed	Depression; Anxiety	Quantitative synthesis	Verified/extracted from working dataset
5	Sweileh et al. (2014)	Palestine	Type 2 diabetes mellitus	Primary healthcare center	Depression	Quantitative synthesis	Verified/extracted from working dataset
6	Islam et al. (2015)	Bangladesh	Type 2 diabetes mellitus	Tertiary hospital outpatient/diabetes care	Depression	Quantitative synthesis	Verified/extracted from working dataset
7	Ganasegeran et al. (2014)	Malaysia	Type 2 diabetes mellitus	Endocrinology outpatient clinic	Depression; Anxiety	Quantitative synthesis	Verified/extracted from working dataset
8	El Mahalli (2015)	Saudi Arabia	Type 2 diabetes mellitus	Hospital diabetes outpatient clinics	Depression	Quantitative synthesis	Verified/extracted from working dataset
9	Le et al. (2022)	Vietnam	Type 2 diabetes mellitus	Hospital outpatient clinic	Depression	Quantitative synthesis	Verified/extracted from working dataset
10	Karki et al. (2024)	Nepal	Type 2 diabetes mellitus	Community/routine-care chronic disease sample	Depression	Quantitative synthesis	Verified/extracted from working dataset
11	Engidaw et al. (2020)	Ethiopia	Diabetes mellitus	Diabetes outpatient department	Depression	Quantitative synthesis	Verified/extracted from working dataset
12	Ebrahim et al. (2021)	Ethiopia	Diabetes mellitus	Diabetic clinics at public hospitals	Depression	Quantitative synthesis	Verified/extracted from working dataset

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No.	Study/citation	Country	Condition /population	Setting	Extractable outcome data	Pooling status	Notes
13	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
14	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
15	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
16	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
17	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
18	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote

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No.	Study/citation	Country	Condition /population	Setting	Extractable outcome data	Pooling status	Notes
							library before journal submission
19	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
20	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
21	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
22	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
23	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission

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No.	Study/citation	Country	Condition/population	Setting	Extractable outcome data	Pooling status	Notes
24	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
25	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
26	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
27	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
28	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
29	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote

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No.	Study/citation	Country	Condition /population	Setting	Extractable outcome data	Pooling status	Notes
							library before journal submission
30	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
31	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
32	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
33	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
34	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission

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No.	Study/citation	Country	Condition/population	Setting	Extractable outcome data	Pooling status	Notes
35	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
36	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
37	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
38	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
39	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote library before journal submission
40	Qualitative-only study - details required	Not available	Not available	Not available	Not pooled	Qualitative synthesis only	Insert final bibliographic details from the screening log/EndNote

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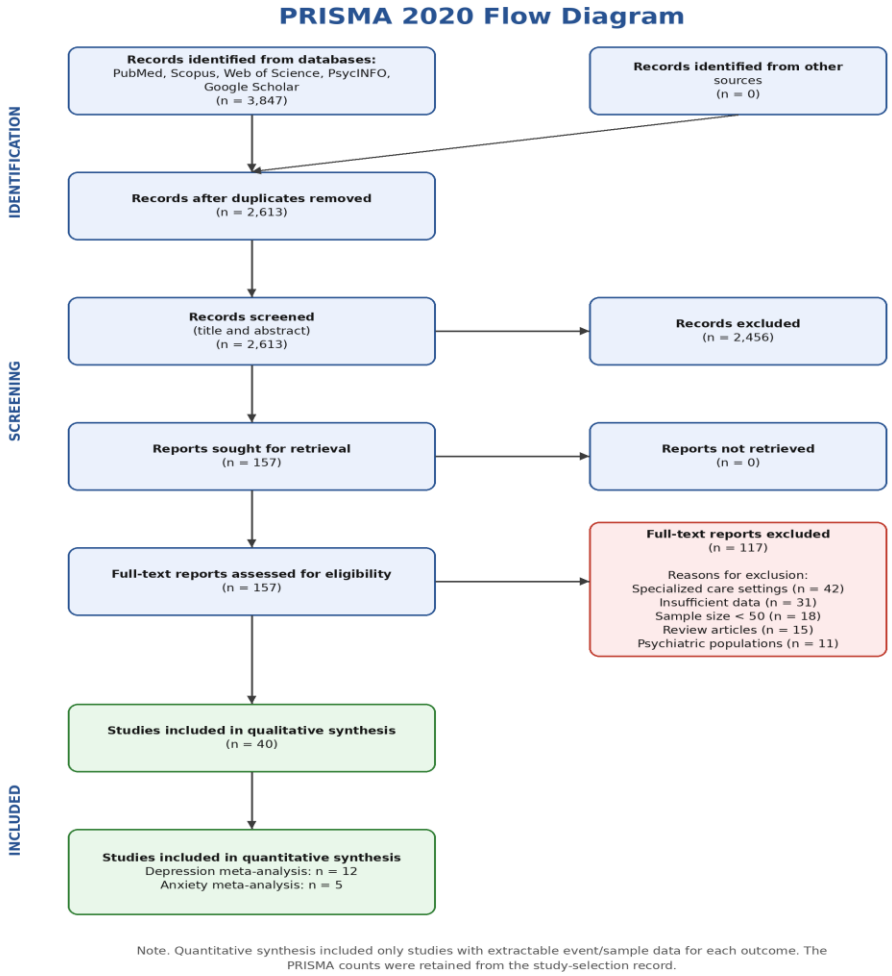
No.	Study/citation	Country	Condition /population	Setting	Extractable outcome data	Pooling status	Notes
							library before journal submission

Important completion note. The PRISMA flow identifies 40 studies in the qualitative synthesis, but only the quantitatively extracted studies were available in the working dataset. The remaining qualitative-only rows must be populated from the final screening log/reference manager export. They are intentionally not invented here.

Figure 1. PRISMA 2020 flow diagram for study selection.



Note. Quantitative synthesis included only studies with extractable event/sample data for each outcome. The PRISMA counts were retained from the study-selection record.

Figure 2. Forest plot of depression prevalence among adults with chronic medical illnesses in primary care and outpatient clinical settings.

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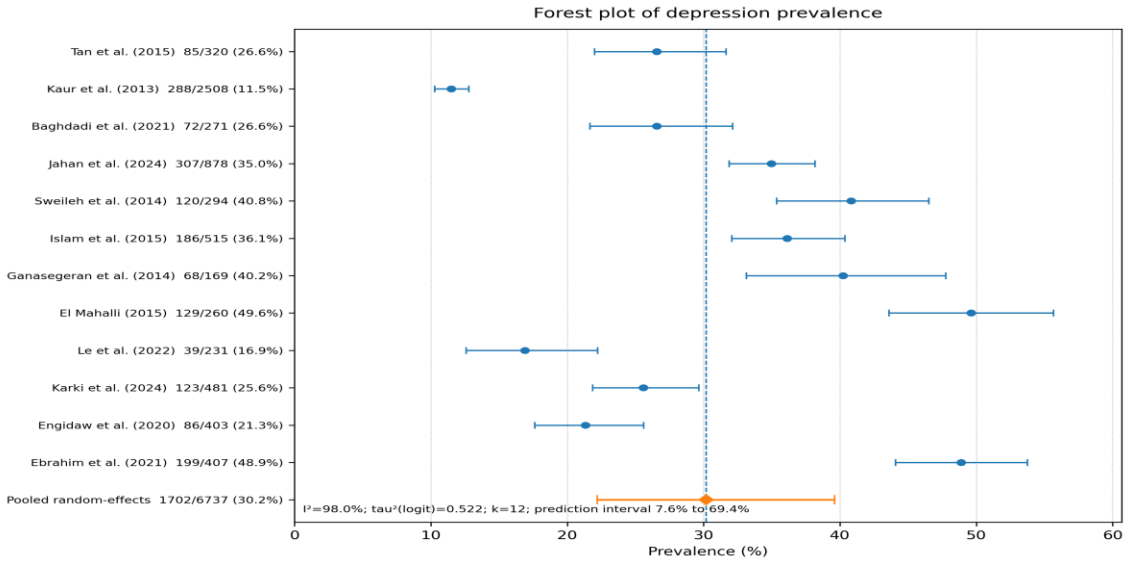
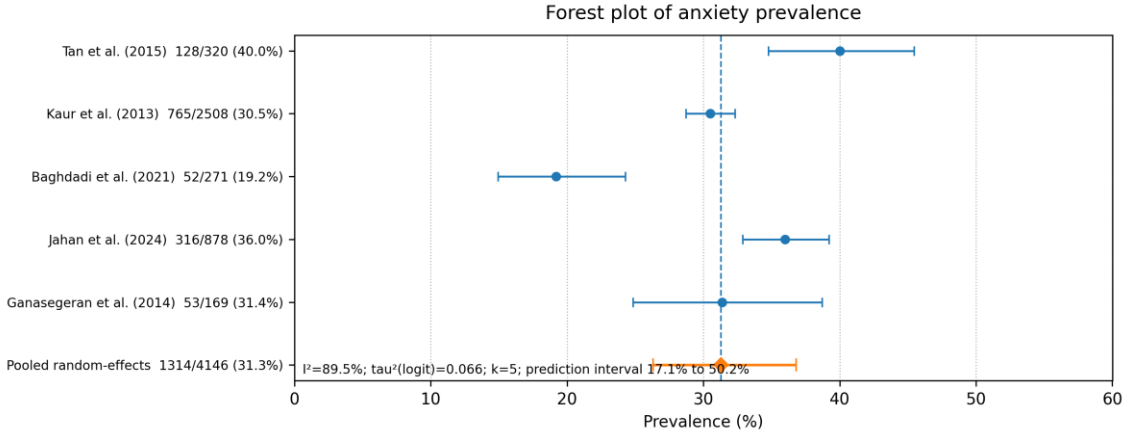


Figure 3. Forest plot of anxiety prevalence among adults with chronic medical illnesses in primary care and outpatient clinical settings.



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