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Predictors of drug-related problems among psychiatric patients with anxiety disorders: a systematic review

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ABSTRACT: Anxiety disorders are a major component of mental health conditions and are commonly managed with long-term pharmacotherapy, including the use of antidepressants and anxiolytics. The complexity of these regimens increases the risk of drug-related problems (DRPs), which may compromise treatment effectiveness, patient safety, and adherence to medication. This systematic review aimed to identify and synthesize the risk factors associated with DRPs in patients with anxiety disorders. A comprehensive systematic search was conducted across electronic databases according to the PRISMA guidelines. Observational studies were included to reflect real-world clinical practice, and the methodological quality of the included studies was assessed using the Newcastle-Ottawa Scale (NOS). Studies published between 2016 and 2026 were considered; however, only eligible studies published between 2022 and 2025 were included in the final analysis. Ten studies involving 151,331 participants from inpatient and outpatient settings were analyzed. Polypharmacy was the most consistently reported predictor of DRPs (7/10 studies). Other commonly identified risk factors included comorbidities (7/10), older age (6/10), use of multiple psychotropic medications (6/10), longer treatment duration or hospitalization (5/10), poor medication adherence (5/10), and inappropriate dosing (4/10). Patients with anxiety disorders are at considerable risk of DRPs, with polypharmacy being the most critical predictor. These findings highlight the importance of targeted pharmaceutical care interventions, including medication reviews, deprescribing, and adherence optimization, as well as the key role of pharmacists in improving pharmacotherapy outcomes.

KEYWORDS: Anxiety disorder; drug related problem; predictors; risk factors.

INTRODUCTION

Globally, anxiety disorders constitute a major public health concern, given their high prevalence and substantial impact on quality of life and health care utilization. According to estimates from the World Health Organization, over 300 million individuals are affected worldwide, with an increasing prevalence observed after the COVID-19 pandemic [1]. These findings indicate that anxiety disorders are not limited to specific regions but represent a widespread global burden affecting both high- and low- and middle-income countries. In Indonesia, the Indonesian Health Survey (SKI) 2023 reported that mental health disorders are a significant public health concern. The prevalence of mental health problems among individuals aged ≥15 years was reported to be 2%, with a depression prevalence of 1.5% and 0.25% reporting suicidal ideation. Although anxiety disorder-specific prevalence was not explicitly reported in the SKI 2023, the survey findings emphasized the sustained public health burden of mental health conditions, including anxiety and depression, in Indonesia [2].

Pharmacological management of anxiety disorders typically involves the use of antidepressants, particularly SSRIs and SNRIs, alongside anxiolytic medications such as benzodiazepines, which are often administered concurrently and for a prolonged duration. Such complex treatment regimens may predispose patients to drug-related problems (DRPs), including clinically relevant drug-drug interactions, inappropriate drug selection, and insufficient management of adverse drug reactions [3]. Drug-related problems (DRPs) encompass events or circumstances related to drug therapy that may compromise therapeutic outcomes. Within the context of anxiety disorders, DRPs commonly include polypharmacy, clinically significant drug-drug interactions, inappropriate drug choice or dosage, adverse drug reactions, and non-adherence to prescribed treatment [4]. Treatment success is highly dependent on patient adherence, which is frequently suboptimal in routine clinical practice [5].

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Drug-related problems are commonly encountered in psychiatric patients, including those with anxiety disorders. Dagnew et al. (2022) reported that 60.9% of hospitalized psychiatric patients experienced at least one DRP, with the most frequent problems being the need for additional drug therapy, adverse drug reactions, and non-adherence. Although this study focused on inpatient settings, similar patterns are likely to occur in outpatient populations receiving long-term pharmacotherapy [6]. Sampogna et al. (2023) reported non-adherence rates ranging from 40% to 70% among patients with severe mental disorders, including anxiety disorders, which were associated with symptom worsening, relapse, and treatment resistance [7].

Several factors have been reported to contribute to the occurrence of DRPs, including demographic characteristics (age and sex), clinical factors (diagnosis and comorbidities), and medication-related factors (type of pharmacological agent, number of medications, and treatment duration). Polypharmacy consistently increases the risk of DRPs. For example, Komatsu et al. (2024) demonstrated an association between polypharmacy and long-term hypnotic use among patients in Japan, with implications for adverse effects and dependence [8]. Jerjes et al. (2024) emphasized deprescribing as a potential strategy for reducing the risks associated with polypharmacy in primary mental healthcare settings. Inappropriate dosing or subtherapeutic treatments also contribute to DRPs [9]. Von Knorring et al. (2023) reported that patients with depression frequently receive inadequate antidepressant therapy in terms of drug selection and dosing, which adversely affects clinical outcomes [10].

Despite growing evidence on the occurrence of drug-related problems (DRPs) and their associated factors in psychiatric populations, the available evidence remains fragmented, particularly in patients with anxiety disorders. Previous systematic reviews have primarily focused on broad psychiatric populations, with limited evidence specifically addressing anxiety disorders. Unlike prior reviews, this study provides a focused synthesis of observational evidence on risk factors for DRPs in patients with anxiety disorders, thereby addressing a specific gap in the literature, particularly in relation to pharmacotherapy for anxiety. Therefore, this systematic review aimed to identify and summarize the risk factors associated with drug-related problems among patients with anxiety disorders to support improved pharmacotherapy management and pharmaceutical care interventions.

METHODS

Data sources

This systematic review was conducted according to the PRISMA guidelines. A systematic literature search was conducted across multiple electronic databases, including ScienceDirect, Scopus, PubMed, Google Scholar, and Frontiers, to ensure comprehensive coverage of biomedical, pharmaceutical, and multidisciplinary literature relevant to drug-related problems (DRPs) in patients with anxiety disorders. A systematic literature search was conducted across multiple databases for studies published between 2016 and 2026. The search process was performed between November 2025 and January 2026.

The search strategy included combinations of keywords and Boolean operators such as: ("drug-related problems" OR "DRPs" OR "medication errors") AND ("anxiety disorders" OR "generalized anxiety disorder" OR "panic disorder") AND ("risk factors" OR "predictors"). The search strategy was adapted for each database to ensure the comprehensive retrieval of relevant studies. Studies published between 2016 and 2026 were screened for eligibility. However, the studies that met the inclusion criteria and were included in the final analysis were published between 2022 and 2025. The definition and classification of drug-related problems (DRPs) were based on the criteria reported in each of the included studies. Due to variability across studies, no single standardized classification system was uniformly applied.

Study selection

Study selection followed the PRISMA flow diagram (Figure 1). A total of 1,378 records were identified through the database search. After removing 312 duplicates, 1,066 records were screened based on their titles and abstracts, of which 820 were excluded due to ineligible publication types or irrelevance. A total of 246 full-text articles were retrieved, and 130 were assessed for eligibility. Of these, 120 articles were excluded for not meeting the inclusion criteria, such as not involving patients with anxiety disorders, not reporting drug-related

problems (DRPs), or not analyzing the associated risk factors. Ultimately, ten studies were included in the final analysis.

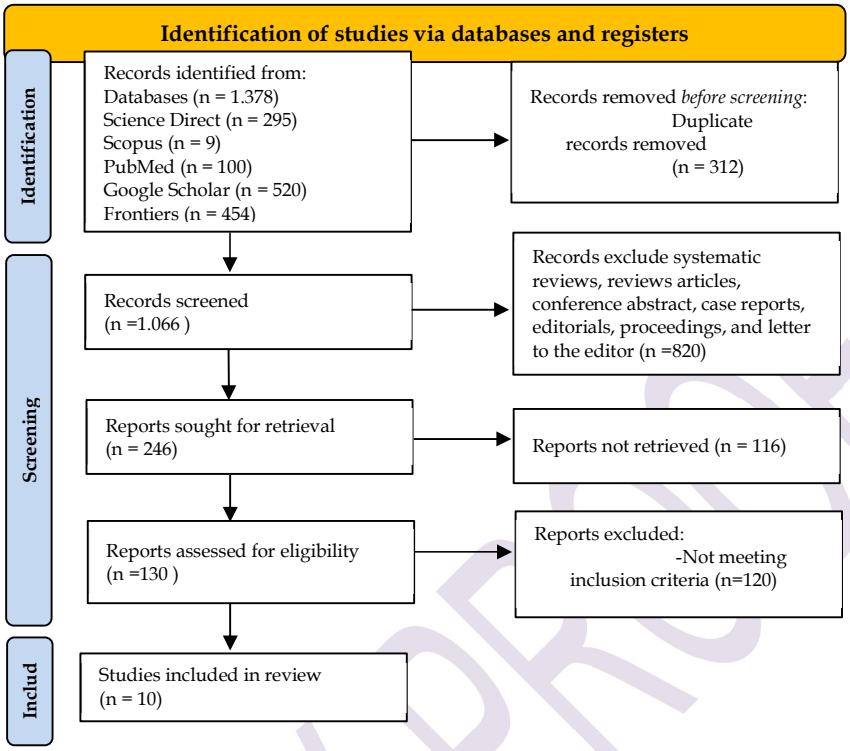

Figure SEQ Figure * ARABIC 1. PRISMA flow diagram of the literature search and study selection process, prepared by the author (2026)

Eligibility criteria

The eligibility criteria for this systematic review were formulated based on the PICO framework, which provides a structured approach to defining the population, exposure, comparison, and outcomes, thereby ensuring clarity, consistency, and reproducibility in study selection. The population of interest consisted of adults aged ≥18 years who were diagnosed with anxiety disorders. Exposure included pharmacological treatments for anxiety, such as antidepressants, anxiolytics, and other psychotropic medications. Comparisons were based on internal group differences, such as patients with and without drug-related problems (DRPs) or analyses identifying factors associated with DRPs. The primary outcome was the occurrence of DRPs and associated risk factors or predictors.

Studies were included if they were observational in design (cross-sectional, cohort, or retrospective), involved adult patients with anxiety disorders receiving pharmacological therapy, reported DRPs, and analyzed the associated risk factors using statistical methods. Eligible articles were restricted to English and Indonesian languages to ensure accurate interpretation and data extraction by the review team while maintaining accessibility to relevant regional and international literature.

The time frame 2016-2026 was applied to capture both foundational and recent evidence, while studies included in the final synthesis (2022-2025) reflected the most relevant and methodologically robust evidence available. Only studies providing quantitative data on DRPs or associated factors were included to enable objective comparison and synthesis of risk factors across studies and reduce interpretative bias from purely qualitative reporting. Studies involving mixed psychiatric populations were included only if anxiety disorder-specific data were separately extracted. These criteria ensured that the review focused on comparable, high-quality evidence to accurately assess DRPs and their determinants in adults with anxiety disorders.

Data extraction

Data extraction was conducted by the primary reviewer using a predefined and standardized data collection tool to ensure the consistency and completeness of the collected information. The extracted data included the names of the authors and year of publication, study titles, study location and setting, research design, sample size, patient demographics, types of anxiety disorders, pharmacological regimens administered, definitions and classifications of drug-related problems, reported prevalence of drug-related problems, identified risk factors or predictors, statistical approaches employed, and the main study outcomes. To enhance the reliability and accuracy of the extracted data, the results of the data extraction process were reviewed and validated by a second reviewer (supervisory author). Any discrepancies or unclear information identified during this process were discussed and resolved by consensus. A standardized extraction form was used to minimize bias and ensure uniform data collection across the studies.

Quality assessment

The methodological quality of the included studies was assessed using the Newcastle-Ottawa Scale (NOS) adapted for observational research. The assessment was conducted by the first author and subsequently reviewed and validated by a second author (supervisory reviewer) to ensure the consistency and accuracy of the scoring. Any discrepancies or unclear judgments were resolved through discussion to reach a consensus. The supervisory author provided methodological guidance throughout the quality assessment process. Formal inter-reviewer agreement statistics (e.g., Cohen's kappa) were not calculated because the assessment process involved a primary reviewer with supervisory validation rather than an independent parallel review. NOS evaluates three domains: selection of study groups, comparability, and outcome assessment, with total scores ranging from 0 to 9. The studies were categorized as high quality (7-9), moderate quality (4-6), or low quality (≤3).

Data synthesis

Due to variations in study design, study populations, definitions of drug-related problems, and reported outcomes, the findings were synthesized narratively, and quantitative meta-analysis was not conducted. This systematic review protocol was not registered in PROSPERO, which is acknowledged as a limitation of this study.

▪ RESULTS

Study selection

Ten studies met the inclusion criteria for this systematic review. The study selection process followed the PRISMA guidelines and is presented in Figure 1.

Study characteristics

The included studies comprised 151,331 participants across psychiatric populations; however, only data relevant to anxiety disorders were extracted and synthesized, where available. The study designs included cross-sectional (n = 5), retrospective cohort (n = 3), prospective observational (n = 1), and longitudinal survival analysis (n = 1), with sample sizes ranging from 72 to 112,256. All included studies were published within the last 10 years (2016-2026), with the final selected studies published between 2022 and 2025. The detailed characteristics of the included studies are presented in Table 1.

Quality assessment

The methodological quality of the included studies ranged from moderate to high quality. Four studies were classified as moderate quality (NOS score 5-6), while the majority were rated as high quality (NOS score 7-9). Higher-quality studies were generally characterized by larger sample sizes, stronger study designs, and more robust confounding variable control. Most studies demonstrated adequate performance in the selection and outcome domains; however, comparability scores were generally lower because of the limited control of confounding variables. The detailed NOS scores for each study are presented in Table 2.

Findings (Drug-related problems)

The prevalence of drug-related problems (DRPs) varied across the included studies. Dagnew et al (2022) reported that 60.9% of psychiatric inpatients experienced at least one DRP, while Sunny et al (2022) found a

high prevalence of clinically significant drug-drug interactions among psychiatric patients [6], [11]. In addition, medication-related issues, such as inappropriate drug selection, dosing problems, and non-adherence, were frequently reported and contributed to suboptimal therapeutic outcomes. Overall, these findings indicate that DRPs are common in psychiatric populations and are primarily driven by treatment complexity and medication-related factors of the patients.

Predictors of drug-related problems

Polypharmacy emerged as the most consistent risk factor for DRPs, as reported in seven studies [6],[8], [9],[12], [13]-[15]. Other common risk factors include comorbid illnesses, older age, longer treatment duration or hospital stay, use of psychotropic medications (antipsychotics, antidepressants, and sedative-hypnotics), inadequate dosing, and poor medication adherence. Deprescribing interventions reduce DRPs by lowering the medication burden [9].

Studies focusing specifically on patients with anxiety disorders have highlighted that combination therapy and irregular treatment patterns increase the risk of relapse and potential DRPs [13] [8]. Patients with psychiatric comorbidities such as depression or PTSD have a higher medication burden and an increased likelihood of inappropriate drug use [16].

Risk factors were synthesized through thematic grouping based on similarities in clinical relevance and reported associations across the included studies. These risk factors were broadly categorized into patient-related factors (such as age, sex, and comorbidities), disease-related factors (including diagnosis and severity of anxiety symptoms), and medication-related factors (such as polypharmacy, type of psychotropic medication, and treatment duration). Collectively, these findings suggest that DRPs are multifactorial, resulting from the interaction between patient characteristics, disease complexity, and pharmacological treatment patterns. A comprehensive summary of the identified risk factors and their clinical implications is provided in Table 3.

Table 1. Characteristics of the studies included in the systematic review.

No	Author [Year]	Country	Study design	Population / sample size	Main results
1	Dagnew et al. [2022] [6]	Ethiopia	Multicenter cross-sectional	Adult psychiatric inpatients, n = 325	DRPs were identified in 60.9% of patients (95% CI: 55.7-65.8), with a mean of 0.6 ± 0.49 DRPs per patient. Independent predictors included rural residence (adjusted odds ratio [aOR] = 1.96; 95% CI: 1.01-2.84; p = 0.046), self-employment (aOR = 6.0; 95% CI: 1.0-36.9; p = 0.035), and alcohol consumption (aOR = 6.40; 95% CI: 1.12-37.5; p = 0.034).
2	Komatsu et al. [2024] [8]	Japan	Retrospective cross-sectional	Adult patients prescribed hypnotics, n = 112,256	Hypnotic polypharmacy (32.1%) was significantly associated with a longer prescription duration. Compared with 1-month use, the risk increased with duration: 4-6 months (aOR = 1.15; p = 0.006), 7-9 months (aOR = 1.35; p< 0.001), 10-12 months (aOR = 1.58; p< 0.001), and 13-24 months (aOR = 3.24; p<0.001).
3	Jerjes et al. [2024] [9]	United Kingdom	Observational cohort	Primary care patients with mental health polypharmacy, n = 72 (deprescribing intervention: n = 68)	Deprescribing significantly reduced the number of psychotropic and adjunct medications over 18 months, along with reductions in adverse effects and drug–drug interactions. Improvements were observed in the PHQ-9 and GAD-7 scores and physical parameters, although no specific p-values were reported.

No	Author [Year]	Country	Study design	Population / sample size	Main results
4	von Knorring et al. [2023] [10]	Sweden	Prospective observational	Psychiatric patients with depression, n = 402	Only 53% of the patients received treatment concordant with the guidelines. Patients with treatment-resistant depression were less likely to receive adequate therapy (25% vs. 84%; p < 0.005). Significant improvement in PHQ-9 scores was observed (mean change −3.8±5.7; p<0.0005), although 45% of patients showed no meaningful clinical improvement.
5	Sunny et al. [2022] [11]	India	Prospective observational study	Hospitalized psychiatric patients, n = 112	Potential drug-drug interactions (DDIs) were identified in 66.96% of the patients. A total of 201 DDIs were detected: 52.73% were major, 37.31% were moderate, and 19.82% were minor. Contraindicated combinations accounted for 7.46% of the total.
6	Wiersema et al. [2022] [12]	Netherlands	Observational cohort	Older adults with depressive disorder, n = 375	The prevalence of polypharmacy was higher in patients with depression (46.9% vs. 19.7%). The independent determinants included lower education, cognitive impairment, and comorbidities. The number of medications was associated with worse outcomes (OR = 1.24; 95% CI: 1.03-1.49; p = 0.022).
7	Kim et al. [2023] [13]	South Korea	Nationwide retrospective cohort	Adult patients with anxiety disorders, n = 34,378	The use of ≥3 antidepressants reduced the relapse risk (aHR = 0.229; 95% CI: 0.204-0.256), whereas combination therapy increased the relapse risk (aHR = 1.215; 95% CI: 1.131-1.305), indicating the complexity of pharmacotherapy patterns.
8	Weldemariam et al. [2025] [14]	Mozambique	Longitudinal survival analysis	Psychiatric outpatients, n = 789	Non-adherence occurred in approximately 93% of patients. Older age (≥56 years) increased risk (aHR = 1.33; 95% CI: 1.14-1.55), and amitriptyline use was associated with higher non-adherence (aHR = 1.56; 95% CI: 1.23-1.98).
9	Rahangdale & Ferraro [2025] [16]	United States	Retrospective observational	Fibromyalgia patients with psychiatric comorbidity, n = 1,516	There were significant differences in the length of hospital stay across the comorbidity groups (p<0.0001). Patients with multiple psychiatric comorbidities had longer hospital stays, reflecting the increased complexity of treatment.
10	Mao et al. [2025] [15]	Canada	Cross-sectional	Psychiatric inpatients prior to discharge, n = 1,106	The prevalence of sleep disturbance was 79.6%. Significant associations were found with anxiety (Chi^2 = 80.28; p < 0.001), mental health diagnosis (Chi^2 = 61.35; p<0.001), and poor well-being (Chi^2 = 82.18; p<0.001).

Table 2. Methodological quality of included studies using Newcastle-Ottawa Scale (NOS).

No	Author [year]	Selection (0-4)	Comparability (0-2)	Outcome (0-3)	Total score	Quality category
1	Dagnew et al. [2022] [6]	3	1	2	6	Moderate
2	Komatsu et al. [2024] [8]	4	2	3	9	High
3	Jerjes et al. [2024] [9]	3	1	3	7	High
4	von Knorring et al. [2023] [10]	3	1	2	6	Moderate
5	Sunny et al. [2022] [11]	3	1	2	6	Moderate
6	Wiersema et al. [2022] [12]	3	2	2	7	High
7	Kim et al. [2023] [13]	4	2	3	9	High
8	Weldemariam et al. [2025] [14]	3	1	3	7	High
9	Rahangdale & Ferraro [2025] [16]	3	1	2	6	Moderate
10	Mao et al. [2025] [15]	3	1	2	6	Moderate

Abbreviations:
The Newcastle-Ottawa Scale (NOS) assesses methodological quality across three domains:
a. Selection (0-4 points), which evaluates the representativeness of the study population, selection of participants, and ascertainment of exposure;
b. Comparability (0-2 points), which assesses the extent to which studies control for potential confounding variables; and
c. Outcome (0-3 points), which evaluates the assessment of outcomes, adequacy of follow-up, and outcome reporting.
Studies were categorized based on total NOS scores as follows: low quality (0-3), moderate quality (4-6), and high quality (7-9).

Table 3. Summary of risk factors for Drug-Related Problems (DRPs) in adult psychiatric patients with anxiety disorders.

Risk factor category	Specific risk factor	Key Studies (n) / Sample size	Reported association with DRPs	Suggested clinical implications (from studies)
Patient-related	Age (older adults)	Wiersema 2022 [375]; Weldemariam 2025 [789] [12]	Increased DRP risk; poor adherence; higher polypharmacy	Older patients more vulnerable; recommend targeted review and adherence support
	Sex (Male / Female)	Dagnew 2022 [325]; Wiersema 2022 [375] [6], [12]	Explored in some studies; not consistently significant	Consider sex in monitoring, especially when interacting with age/comorbidities
	Comorbidities (psychiatric / medical)	Dagnew 2022 [325]; Wiersema 2022 [375]; Rahangdale & Ferraro 2025 [1,516]; Mao 2025 [1,106] [6], [12], [16]	Higher DRP risk, treatment complexity, longer hospital stay	Requires individualized therapy and careful monitoring
Disease-related	Diagnosis / Severity of Anxiety	Kim 2023 [34,378]; Rahangdale & Ferraro 2025 [1,516]; Mao 2025 [1,106] [13], [15], [16]	More severe or complex anxiety → higher risk of DRPs	Tailored treatment plans needed; monitor relapse or symptom progression
Medication-related	Polypharmacy	Dagnew 2022 [325]; Komatsu 2024 [112,256]; Jerjes 2024 [72]; Wiersema 2022 [375]; Kim 2023 [34,378]; Weldemariam 2025 [789]; Mao 2025 [1,106] [6], [8], [9], [12], [13], [14], [15]	Increased risk of DRPs, relapse, adverse events	Deprescribing reduces medication burden (Jerjes 2024); combination therapy increases risk (Kim 2023)
	Specific psychotropic medications (antipsychotics, antidepressants)	Dagnew 2022 [325]; Komatsu 2024 [112,256]; Kim 2023 [34,378] [6], [8], [13]	Associated with DDIs and DRPs	Optimize dosing; monitor drug interactions; avoid unnecessary combinations
	Sedative / hypnotic use	Komatsu 2024 [112,256]; Mao 2025 [1,106] [8], [15]	Sleep disturbances, dependency, DRPs	Reduce polypharmacy; monitor dose and duration
	Non-adherence	Weldemariam 2025 [789] [14]	Non-adherence leads to	Interventions to improve adherence recommended

Risk factor category	Specific risk factor	Key Studies (n) / Sample size	Reported association with DRPs	Suggested clinical implications (from studies)
			suboptimal outcomes, relapse	
	Inadequate dosing / drug selection	von Knorring 2023 [402] [10]	Suboptimal therapeutic outcomes; potential DRPs	Dose optimization; follow guideline-based prescribing

Overall, the findings of this systematic review indicate that drug-related problems among patients with anxiety disorders are influenced by multiple interacting factors, particularly polypharmacy, comorbidities, and complex pharmacotherapy regimens. These findings highlight the need for careful medication management and targeted interventions to reduce DRPs in this population.

▪ DISCUSSION

The methodological quality of the included studies ranged from moderate to high, with Newcastle-Ottawa Scale (NOS) scores between 6 and 9. Most studies demonstrated adequate methodological rigor in the selection and outcome domains, indicating that the study populations were generally well-defined and the outcomes were appropriately measured. However, comparability scores were relatively low across several studies, reflecting limited adjustment for potential confounding variables. In addition, the predominance of cross-sectional and observational study designs limits causal inference, as most findings represent associations rather than causal relationships between variables.

Despite these methodological limitations and heterogeneity across studies, this systematic review demonstrates that drug-related problems (DRPs) are highly prevalent among adult psychiatric patients, particularly those with anxiety disorders. This review provides a more focused synthesis than previous studies by specifically addressing anxiety disorder populations, which have been underrepresented in prior systematic reviews. The findings indicate that DRPs frequently occur in real-world clinical practice and are closely associated with complex pharmacotherapy, including long-term treatment and the use of multiple psychotropic medications. This is clinically important because it highlights the persistent burden of DRPs in anxiety disorder populations, where chronic disease management and repeated treatment adjustments are common practices. Without structured monitoring, these treatment patterns may increase the risk of inappropriate prescriptions, drug-drug interactions, and suboptimal therapeutic outcomes.

The high prevalence observed in this review is consistent with previous evidence showing that psychiatric populations are particularly vulnerable to medication-related problems due to treatment complexity and prolonged pharmacotherapy [17]. In addition, clinical guidelines indicate that anxiety disorders often require prolonged treatment and combination pharmacotherapy in certain cases, which may further increase the risk of DRPs if not properly monitored [18].

Among all identified risk factors, polypharmacy was the most consistent and influential predictor of DRPs. This finding aligns with previous studies demonstrating that polypharmacy increases the risk of drug-drug interactions, adverse drug reactions, and inappropriate medication use, particularly in patients with chronic and psychiatric conditions [19], [20]. In anxiety disorder populations, combination therapy involving antidepressants, benzodiazepines, and other psychotropic agents is commonly used in cases of partial response or relapse, further increasing the medication burden and the likelihood of DRPs [21].

Patient-related factors, including older age and psychiatric or medical comorbidities, also significantly contributed to the risk of DRPs. These factors are associated with an increased medication burden and reduced treatment adherence. Previous studies have shown that comorbid conditions complicate pharmacotherapy and increase the likelihood of inappropriate medication use [22]. Medication adherence remains a major challenge in psychiatric populations due to treatment complexity and patient-related factors [5], [23].

Disease-related factors, including the chronic and fluctuating nature of anxiety disorders, further contribute to the occurrence of DRPs. Anxiety disorders often require long-term pharmacological management

with frequent treatment adjustments, which may lead to irregular medication use and suboptimal outcomes [3], [24].

Medication-related factors, particularly psychotropic drug classes and treatment duration, were strongly associated with DRPs. Antidepressants, benzodiazepines, and sedative-hypnotics were the most frequently implicated drug classes, especially when used in combination or for prolonged periods of time. Previous studies have shown that such combinations increase the risk of clinically significant drug-drug interactions and adverse effects [21],[25]. Furthermore, inappropriate prescribing and inadequate dosing remain important contributors to suboptimal therapeutic outcomes in psychiatric care [4].

These findings emphasize the clinical importance of structured medication reviews and deprescribing strategies to reduce the medication burden and improve patient safety. Evidence suggests that interventions targeting polypharmacy and adherence can improve clinical outcomes and reduce the healthcare burden [20], [23]. In this context, clinical pharmacists play a crucial role in optimizing pharmacotherapy through medication reconciliation, identification of drug-related problems, assessment of drug-drug interactions, and promotion of rational prescribing. Early identification of high-risk patients, particularly those with polypharmacy and comorbidities, is essential for preventing DRPs and improving therapeutic outcomes. Early identification of high-risk patients, particularly those with polypharmacy and comorbidities, is essential to prevent DRPs and improve therapeutic outcomes. Integrating clinical pharmacy services into routine mental health care may help reduce preventable DRPs and enhance patient safety in this population.

Despite these important implications, this study has several limitations. First, most of the included studies were observational, which limited the ability to establish causal relationships between identified risk factors and DRPs. Second, there was substantial heterogeneity in study design, sample size, clinical settings, and definitions and classifications of DRPs across studies, which may have affected the comparability of results despite efforts to standardize categories during data synthesis. Third, the majority of the included studies involved mixed psychiatric populations, with only a limited number specifically focusing on anxiety disorders, which may limit the generalizability of the findings and reflect the limited availability of evidence in this specific population. In addition, the methodological limitations of this review include the absence of protocol registration, which may affect transparency. Finally, potential publication bias cannot be ruled out, as studies reporting significant findings are more likely to be published than those reporting non-significant results.

Future research should focus on high-quality prospective studies using standardized DRP classification systems, such as the Pharmaceutical Care Network Europe (PCNE) framework, to improve consistency and comparability across studies, particularly in anxiety disorder populations. Future research should explore intervention-based studies evaluating pharmacist-led strategies for anxiety disorder populations.

▪ CONCLUSION

This systematic review demonstrated that drug-related problems (DRPs) are highly prevalent among adult psychiatric patients, particularly those with anxiety disorders. Polypharmacy was identified as the most consistent risk factor, along with older age, comorbidities, prolonged treatment duration, and use of multiple psychotropic medications. These factors increase the risk of drug-drug interactions, inappropriate medication use, and suboptimal therapeutic outcomes. Given the frequent need for long-term combination pharmacotherapy for anxiety disorders, regular medication review and monitoring are essential. Targeted strategies, such as deprescribing, optimization of drug selection and dosing, and adherence support, should be implemented. The involvement of clinical pharmacists in multidisciplinary care is strongly recommended to reduce DRPs and improve medication safety in older patients. Future research should focus on standardized DRP assessments and effective intervention strategies for anxiety disorder populations.

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