

SYSTEMATIC REVIEW

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Psychotropic use for behavioral and psychological symptoms of dementia during the COVID-19 pandemic: a systematic review and meta-analysis

Jung Min Yoon^{1*}, Eunjin Kim² and Alison M. Trinkoff³

Abstract

Background During the COVID-19 pandemic, the provision of quality care for behavioral and psychological symptoms in older adults with dementia may have been impeded due to physical distancing and infection control measures. Of particular concern is whether psychotropic medication use has increased despite its limited efficacy and adverse effects. This systematic review described the trajectory of psychotropic use for older adults with dementia across various settings, from community living to healthcare settings during the pandemic. Also, psychotropic use was explored in relation to patients, caregivers, and environment-related factors along with the occurrence of the pandemic.

Methods We conducted a comprehensive search across five databases: Embase, PubMed, PsycINFO, CINAHL, and Cochrane Library. Methodological quality was assessed using Joanna Briggs Institute Critical Appraisal tools. A random-effects model was used to estimate the pooled risk ratios (RRs) of psychotropic use in older adults with dementia, comparing the pandemic period to the pre-pandemic period. Subgroup analyses based on the class of psychotropics and sensitivity analyses also were conducted. A funnel plot and Egger's regression test were used to detect potential publication bias.

Results Of the 3,123 screened articles, 15 studies were included in this systematic review, with 10 of them being part of the meta-analysis. Our meta-analysis yielded an RR of 1.16 (95% CI = 1.05–1.26) for overall psychotropic medication use. Further subgroup analysis based on the type of psychotropic medication revealed a significantly greater prevalence in the use of antipsychotics (RR = 1.19, 95% CI = 1.08–1.30). However, no significant differences were observed in the use of anxiolytics and/or hypnotics (including benzodiazepines), antidepressants, and mood stabilizers. Among psychotropics, some studies on antipsychotic use additionally explored patients, caregivers, and environmental-related factors during the pandemic.

Conclusions The review indicates a higher risk of psychotropic use, especially antipsychotics, during the pandemic. Nonetheless, underlying reasons for the increased psychotropic use are not fully available from the reviewed studies. Therefore, further research is needed to identify the factors driving psychotropic use during the pandemic and facilitate the development of quality improvement interventions that can be implemented to minimize inappropriate psychotropic prescribing in future pandemics.

Keywords Dementia, Behavioral and psychological symptoms, Psychotropic medication use, COVID-19 pandemic

*Correspondence:

Jung Min Yoon
jmyoon@ewha.ac.kr

Full list of author information is available at the end of the article



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Brief summary

This review explored the trajectory of psychotropic use for older adults with behavioral and psychological symptoms of dementia across community living and health-care settings during the pandemic. Also, psychotropic use was explored in relation to patients, caregivers, and environment-related factors along with the occurrence of the pandemic.

Background

Behavioral and psychological symptoms of dementia (BPSD) are a major aspect of dementia care and decrease the well-being of people with dementia. Non-pharmacological interventions are generally recommended as a first-line option for BPSD [1–3]. Psychotropics can be used for concerns about harm to self and/or others associated with psychosis or aggression [1, 3]. However, despite limited efficacy and severe adverse effects, psychotropics are often used to treat challenging behaviors with a lack of monitoring for BPSD or the application of non-pharmacological interventions [4–6]. Particularly, concerns about antipsychotic use in long-term care (LTC) settings (e.g., nursing homes (NHs), assisted living (ALs)) have been raised. For example, in the US, the Centers for Medicare and Medicaid (CMS) initiated policies to reduce the unnecessary use of antipsychotics in NHs [7], and a gradual decline has been noted since the initiative, with an average use of 14.5% of NH residents nationally [8]. In Canada, potentially inappropriate prescribing of antipsychotics among LTC settings has been monitored, 24.5% from 2022 to 2023 compared to 27.5% from 2014 to 2015 [4, 9].

In late 2019, a new respiratory syndrome, now known as coronavirus disease 2019 (COVID-19), was reported in China, and the COVID-19 infection spread globally, becoming a pandemic on March 11, 2020 [10]. The pandemic extensively disrupted the daily life of older adults with dementia because confinement and isolation were widely applied as infection control precautions to limit COVID-19 spread. Older adults with dementia were disproportionately vulnerable to severe illness following COVID-19 infection [11]. Those with dementia often had a lack of understanding of basic infection control measures. In addition, they were susceptible to the adverse effects of enforced quarantine [12], as they strongly relied upon community and social support systems due to their dependence for their activities of daily living (ADLs) [13].

In community environments, most home-based rehabilitation interventions and/or outpatient rehabilitation services were postponed or canceled. Physical distancing and infection control measures limited recreational activities, close contact with healthcare providers, and

visits from family and friends, all of which contributed to social isolation in older adults with dementia [14]. In LTC settings, the measures imposed during the pandemic impeded the implementation of non-pharmacological interventions in older adults with dementia [14].

Changes in clinical care provisions in healthcare settings and restrictions during the pandemic may have worsened BPSD in older adults with dementia [15, 16], which could have led to increased reliance on psychotropic use [17–19]. Moreover, the inability to review drug dosages and monitor the efficacy of prescribed psychotropics, due to the disruption of routine assessments may have aggravated adverse consequences of psychotropics [10]. Thus, a systematic review of trends of psychotropic use to manage BPSD during the COVID-19 pandemic among older adults with dementia is greatly needed, to guide the appropriate management of BPSD in future pandemics and/or public health crises.

This review aims to describe empirical evidence on the trajectory of psychotropic use for the management of BPSD across community living, LTC settings, and hospital units for older adults with dementia during the pandemic. In addition, this review explored psychotropic use in relation to patients, caregivers, and environment-related factors along with the occurrence of the pandemic. The pandemic brought enormous changes in patients' psychosocial status, availability of formal/informal caregivers, and clinical practices in acute- and long-term healthcare settings [14, 20–22].

Methods

The systematic review was conducted in adherence with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [23].

Search strategies

We used the following databases to identify potentially eligible articles: Embase, PubMed, PsycINFO, CINAHL, and Cochrane Library. The search terms included a combination of keywords such as (“dementia*” OR “Alzheimer*”) AND (“COVID-19” OR “SARS-Cov-2” OR “pandemic*” OR “corona*”) AND (“psychotropic*” OR “antipsychotic*” OR “antianxi*” OR “hypnotic*” OR “benzodiazepine*” OR “antidepress*” OR “anticonvulsant*” OR “antiepileptic*” OR “cholinesterase*” OR “mementine*” OR “behavio*” OR “psycho*”), as well as their subject headings from each database (e.g., MeSH terms in PubMed) and related synonyms. A database search was performed on March 20, 2024. Full search strategies can be found in the online Supplementary Materials (see Additional file 1).

Inclusion and exclusion criteria

Inclusion criteria

This review included articles that met the following criteria:

- Population: Studies with all or most participants ($\geq 90\%$) diagnosed with dementia. No limits were placed on the type or stage of dementia.
- Outcome: Studies that addressed changes in psychotropic use for BPSD during the COVID-19 pandemic. Psychotropics were defined as antipsychotics, anxiolytics/hypnotics (including benzodiazepines), antidepressants, mood stabilizers (anticonvulsants/antiepileptics), cholinesterase inhibitors, and memantine, based on existing literature [1, 24, 25].
- Setting: Studies across any settings, from community living to healthcare settings.
- Study design and source: Empirical observational studies conducted with quantitative and/or qualitative research methodologies and published in peer-reviewed journals to ensure comprehensive and credible data would be reviewed.
- Publication dates: Articles published between January 1, 2020, and December 31, 2023.

Exclusion criteria

Articles were excluded if they met the following criteria:

- Studies focusing on mental health disorders (e.g., schizophrenia, bipolar disorders) other than dementia.
- Studies not written in English.
- Review papers, case reports, correspondence, or instrument development articles.
- Abstract-only papers.

Study selection and data extraction process

Two reviewers (JMY and EK) independently conducted title and abstract screening for all records obtained from the database and manual searches, and then a full-text review to determine eligibility. Any discrepancies during the study selection process were resolved through discussion.

The following data were extracted from the included studies: authors, publication year, country, study design, data source, comparison period, characteristics of study setting and subjects, measures used, and main findings. Of the 15 included studies, 10 included data on psychotropic use for meta-analysis and were used to estimate risk ratios (RRs) and 95% confidence intervals (CIs) for psychotropic medication use. From the nine studies, we extracted the exact number of people with psychotropic

use when available, or we used crude monthly, yearly, or mean percentages of those patients relative to the sample size for the comparison periods in each study. For one article that presented prevalence ratios and plots for the percentage of each psychotropic use [26], we contacted the author and obtained quarterly percentages. We then calculated and used the average number of people who were prescribed or administered psychotropics, as well as the average sample size before and during the pandemic period from each article.

Quality assessment

The final 15 selected articles were then rated for quality using Joanna Briggs Institute (JBI) Critical Appraisal tools for prevalence studies [27], analytical cross-sectional studies [28], cohort studies [28], or qualitative research [29]. A full review was independently rated by two raters (JMY and EK) to evaluate methodological quality in identifying characteristics of samples and their conditions, describing settings, and measuring outcomes using rigorous statistical evaluations. Additional file 2 shows the summary of the quality appraisal of the included studies.

Statistical analysis

We used the “meta” package in R version 4.3.1 to perform the meta-analysis. Pooled estimates of RRs and 95% CIs were calculated using a random-effects model and the Mantel–Haenszel method. Heterogeneity was assessed using the Higgins Index (I^2). Subgroup analyses were performed based on the class of psychotropics. To assess the robustness of the synthesized results, we conducted sensitivity analyses by sequentially omitting studies and observing changes in the pooled effect size and heterogeneity statistics. A funnel plot and Egger’s regression test were used to detect potential publication bias [30].

Results

Study selection results

Overall, 3,123 articles were identified from the searched databases. After removing 1,024 duplicates, 2,099 articles were screened for title and abstract. After excluding 2,068 articles irrelevant to the topic through title and abstract screening, a full-text review was conducted on 30 articles. After removing 16 studies that met the exclusion criteria and adding one article from the manual search, 15 studies were finally selected for this review. A flowchart for the study selection process (Fig. 1) is presented according to the PRISMA guidelines [23].

Study characteristics

Additional file 3 provides an overview of the included studies. Out of the 15 studies, eight investigated changes

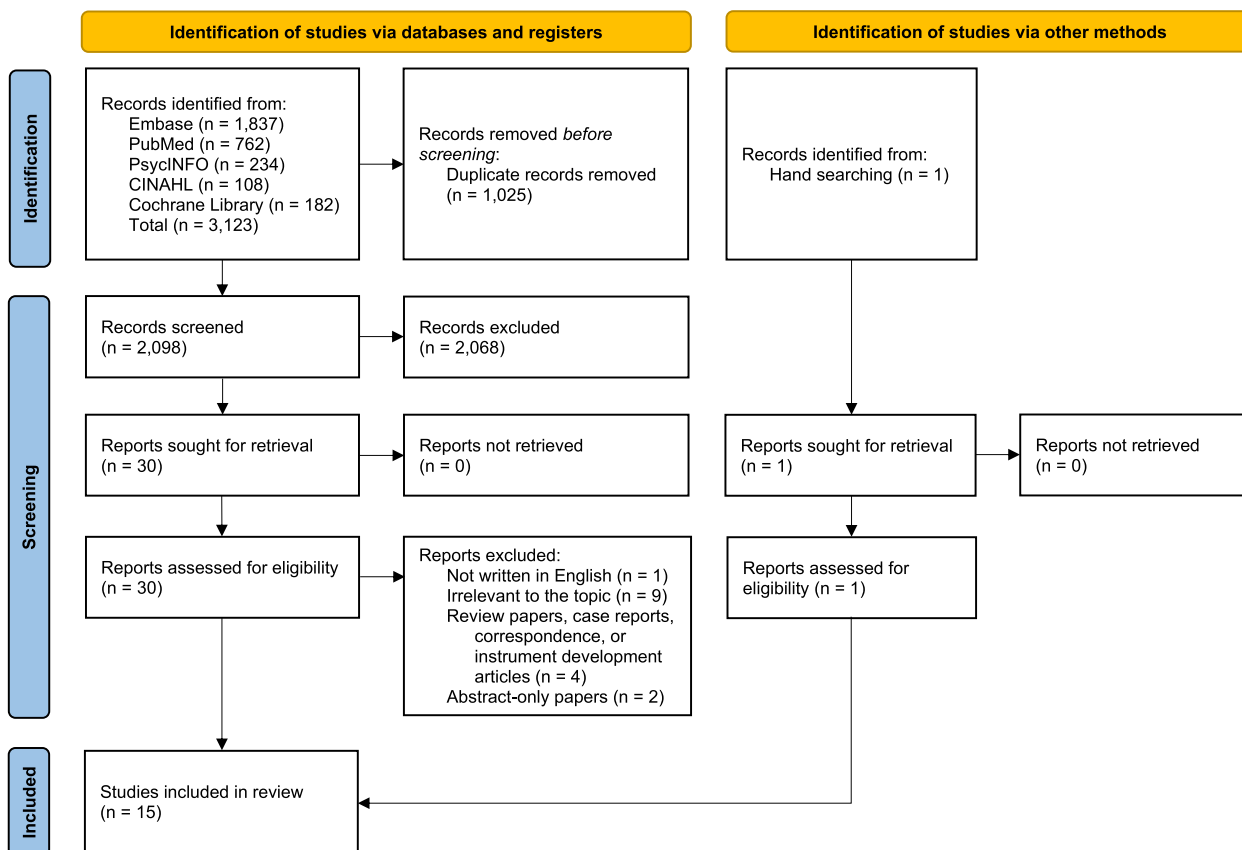


Fig. 1 Flow diagram of the study selection process

among residents with dementia in LTC settings, while two assessed changes in community-dwelling patients. Four studies used data from a mixture of healthcare settings. The included studies covered 10 countries, with three conducted in the US [31–33], three in the UK [20, 34, 35], two in Canada [26, 36], and one study each in Germany [37], Italy [38], the Netherlands [39], Spain [17], and Argentina [40]. Two studies were multinational; one included data from France, Germany, Italy, South Korea, the UK, and the US [41], while the other used global federated data, mainly from the US [42]. The research periods ranged from 2015 to January 2022, including pre-pandemic and pandemic periods.

According to the JBI critical appraisal assessment, this review included five prevalence studies [17, 20, 26, 31, 37], four analytical cross-sectional studies [33, 34, 36, 40], five cohort studies [35, 38, 39, 41, 42], and one qualitative study [32]. The critical appraisal assessment, as shown in Additional file 2, indicated that one-third of reviewed studies scored lower than 70% out of the total scores, mainly due to a lack of clearly identified sample conditions and incompletely addressed confounding variables.

Main findings

Antipsychotics

Among the 15 studies included in this review, 12 articles investigated changes in antipsychotic use during the COVID-19 pandemic. The study settings encompassed LTC settings in seven studies; communities in two studies; and a combination of healthcare settings in the remaining three studies. Overall, as shown in Additional file 3, 10 of the 12 studies (83%) reported an increase in antipsychotic drug use during the pandemic across settings [26, 31, 33–36, 38, 40–42].

Varying patterns in antipsychotic use were shown among the three studies that included NH residents with severe dementia as the majority of study subjects: one reported a significant increase in the average proportion of residents with prescriptions, from 18% (2015–16) to 32% (2020–22) ($p < 0.001$) [34]; another study found a significant but small decrease in the prescription proportion, from 80.5% (April 2018 to March 2020) to 78.2% (April 2020 to March 2021) (absolute difference [AD] = -2.31, 95% CI = -3.68–-0.93, $p < 0.001$) [17]; and in the third study, a stable pattern was noted throughout the initial phase of the pandemic (February to August 2020) [39].

Two studies explored changes in antipsychotic use associated with patient-related factors, along with the occurrence of the pandemic. For example, Schnier and colleagues [35] conducted age-standardized time-series analyses using population-scale health data from Wales. They found that those in the youngest age group (60–64 years) compared to other age groups, had increased prescribing rates of antipsychotics during the pandemic [35]. Additionally, people with all-cause dementia or a subgroup with vascular dementia had fluctuations in prescribing rates, whereas antipsychotic prescriptions in people with Alzheimer's disease steadily increased [35]. A survey-based study on patients with dementia living at home found no difference in the proportions of increased or new-onset antipsychotic use in relation to levels of dementia severity [40].

McDermid and colleagues [34] examined antipsychotic prescription rates in NHs in relation to caregiver-related factors. They categorized NHs into tertiles according to antipsychotic prescription rates (low: 0–14%; medium: 14–36%; high: >36%) and found no significant differences in staff sick days due to COVID-19, total staff sick days, or temporary staff shifts among the three groups [34].

Three studies explored environmental factors in relation to antipsychotic use during the pandemic. A multinational study involving various healthcare settings explored the relationship between the strictness of lockdown policies and the prescribing rate of antipsychotic drugs for people with dementia [42]. They found significant associations across the majority of countries with databases included [42]. For example, a 10-point elevation in the COVID-19 Stringency Index score was related to a 10.2% increase (rate ratio = 1.10, 95% CI = 1.08–1.13) in prescription rates in the South Korean KUN database, and to a 3.3% increase (rate ratio = 1.03, 95% CI = 1.01–1.05) in the UK IMRD database [42]. Yan and colleagues [33] observed a 0.7 percentage-points increase in antipsychotic use among low-minority NHs ($p < 0.001$), and an additional 2.9 percentage-points increase in very-high minority NHs ($p = 0.005$) in the US at the beginning of the pandemic. They also found no significant differences in the impact of the pandemic on antipsychotic use by NH size (beds ≥ 120 vs. smaller), ownership (for-profit vs. not-for-profit) or community location in disadvantaged versus less-disadvantaged communities [33]. Similarly, McDermid and colleagues [34] observed no significant differences in NH size or number of residents with dementia across the low, medium, and high antipsychotic use tertiles in their pandemic sample.

Anxiolytics and/or hypnotics (including benzodiazepines)

Eight studies assessed changes in the use of anxiolytic and/or hypnotic drugs, including benzodiazepines. Among

these, two studies conducted in communities reported increased prescriptions of anxiolytics and/or hypnotics including benzodiazepines [38, 40]. However, findings from studies in LTC settings or a combination of community and LTC settings were mixed. A study using AL settings, found decreased benzodiazepine use in 2021 compared to 2018–19: (prevalence ratio [PR] = 0.86, 95% CI = 0.78–0.95; $p < 0.05$) [26]. Also, a population-scale study in the UK in primary care and care homes observed a downward trend in benzodiazepine use throughout the study period from 2016 to 2021 [35]. Two other studies in NHs noted no significant differences in benzodiazepine use between pre-pandemic and pandemic periods [17, 39]. In contrast, another NH study reported an increase in anxiolytic drug use (slope change [SC] = 0.17, 95% CI = 0.13–0.21, $p < 0.001$) but no difference in hypnotic drug use [31], while another NH study reported increased PRN lorazepam injections [36].

Additionally, regarding patient-related factors, Cohen et al. [40] reported no significant relationship between an increase or onset of benzodiazepine and hypnotic prescriptions and dementia severity. Whereas no studies explored the use of anxiolytics and/or hypnotics in relation to caregivers and environmental-related factors.

Antidepressants

Among the five studies examining antidepressants, four studies (three in LTC settings, and one in the community) reported an increase in antidepressant use as shown in Table S3 [17, 26, 31, 40]. However, Sizoo et al. [39] found no significant changes in antidepressant use among NH residents. Regarding patient-related factors, Cohen et al. [40] reported no significant associations between increased or initiated antidepressant prescriptions and dementia severity. However, there was no study on the use of antidepressants in relation to caregivers and environmental-related factors.

Mood stabilizers

Two studies investigated changes in mood stabilizer use in LTC settings before and during the pandemic. Ferro Uriguén and colleagues [17] examined antiepileptic drug prescription rates among NH residents and found a significant increase in the average prevalence from 36.3% to 42.4% (AD = 6.10, 95% CI = 3.20–9.00, $p < 0.001$), while another study reported no significant change in dispensing rates of anticonvulsants among AL setting residents throughout the pandemic [26]. Among the reviewed studies, no studies explored the use of mood stabilizers in relation to patients, caregivers, and environmental-related factors.

Cholinesterase inhibitors and memantine

No studies were found regarding changes in the use of cholinesterase inhibitors and memantine during the COVID-19 pandemic.

All types of psychotropics

Two mixed-methods studies explored BPSD occurrence and all types of psychotropic use during the pandemic. Hoel and colleagues [37] found a low increase in pharmacological therapy for BPSD among 5.6% of German NHs along with increased occurrence of depression, anxiety, and appetite loss. Harding and colleagues [20] reported that about one quarter (26%) of 184 formal/informal caregivers for people with rarer dementias reported an increase or initiation of psychotropic use in those they were caring for, and two-thirds stated people with dementia experienced worsening of cognitive symptoms, ability to do things, and well-being.

Meta-analysis

Figure 2 shows the pooled RRs of psychotropic use in individuals with dementia during the pandemic period compared to the pre-pandemic period. Our meta-analysis yielded an RR of 1.16 (95% CI=1.05–1.26) for overall psychotropic medication use, with high heterogeneity ($I^2=89\%$). Further subgroup analysis revealed that the COVID-19 pandemic was associated with a significantly higher prevalence of antipsychotic use (RR=1.19, 95% CI=1.08–1.30, $I^2=89\%$), while no significant changes were observed for anxiolytics and/or hypnotics (including benzodiazepines) (RR=1.13, 95% CI=0.79–1.63, $I^2=93\%$), antidepressants (RR=1.04, 95% CI=1.00–1.08, $I^2=42\%$), and mood stabilizers (RR=1.07, 95% CI=0.94–1.22, $I^2=0\%$). Sensitivity analyses revealed consistent results on the pooled RR of psychotropic use for BPSD (RR=1.15, 95% CI=1.05–1.26, $p<0.01$) (see Additional file 4). Visual inspection of the funnel plot demonstrated a symmetrical distribution (see Additional file 5). This observation was confirmed by Egger's regression test, suggesting an absence of potential publication bias ($p=0.26$).

Discussion

Overall, the review indicates slightly higher risks of increased psychotropic use in relation to the pandemic period from the meta-analysis, although some studies showed non-significant changes in the use of psychotropic medications. Subgroup analysis for each type of psychotropics indicated a small but significant likelihood of an increase in antipsychotic use.

Most reviewed studies and their meta-analyses reported an increase in the use of antipsychotics during

the pandemic. It is not surprising to expect an increase in antipsychotic use given an increased prevalence of agitation, aggression, and psychosis during the pandemic [43–46]. Despite the efficacy of atypical antipsychotics for anger, aggression, and paranoid ideas, careful evaluation is needed because these agents have little efficacy for wandering and vocalizations and carry significant adverse effects [47–49]. Moreover, antipsychotics may worsen respiratory function and increase the risk of thromboembolism for those with COVID-19 infections [50].

The second most frequently used psychotropics were anxiolytic and hypnotic drugs and antidepressant medications. However, some LTC settings experienced a decreased use of benzodiazepines throughout the pandemic [17, 26], possibly due to increased use of other psychotropics, and such trends should be carefully monitored [51]. Benzodiazepines can be used for agitation and anxiety, but should not be routinely used due to dependence and adverse effects among older adults [2, 52]. Compared to benzodiazepines, most reviewed studies reported an increase in antidepressant use during the pandemic. The increase in antidepressant use coincides with an increased prevalence of depression, apathy, and agitation during the pandemic [46, 51, 53, 54]. Whilst antidepressants are relatively safe for the management of BPSD [55], the evidence of efficacy in the treatment of depression and agitation is mixed [48, 55–58].

Noted was a predominance of studies of antipsychotic use in LTC settings. Despite a higher proportion of older adults with dementia, ranging from 40 to 90% [9, 59, 60], LTC settings often lack sufficient professional staff, have insufficient dementia care training, and poorer environmental resources, all of which were related to a greater prevalence of psychotropic use compared to acute healthcare settings [60–64]. Especially, among the reviewed studies, a greater increase in antipsychotic use and a higher decrease in nurse staffing occurred in NHs with a larger proportion of racial and ethnic minority residents [33]. High minority LTC settings, even before the pandemic, lacked appropriate mental health-related services and had higher antipsychotic use [65, 66]. Thus, greater attention needs to be paid to vulnerable LTC settings to ameliorate pre-existing environmental conditions and help them cope with the challenges of providing quality dementia care in the post-pandemic era.

This review implies the need for consideration of patients, caregivers, and environment-related determinants of psychotropic use. Among reviewed studies, only two reported higher antipsychotic prescriptions in relation to environmental factors, such as stricter lockdown policies and having larger racial/ethnic minorities [33, 42]. Despite no relationship between psychotropic use

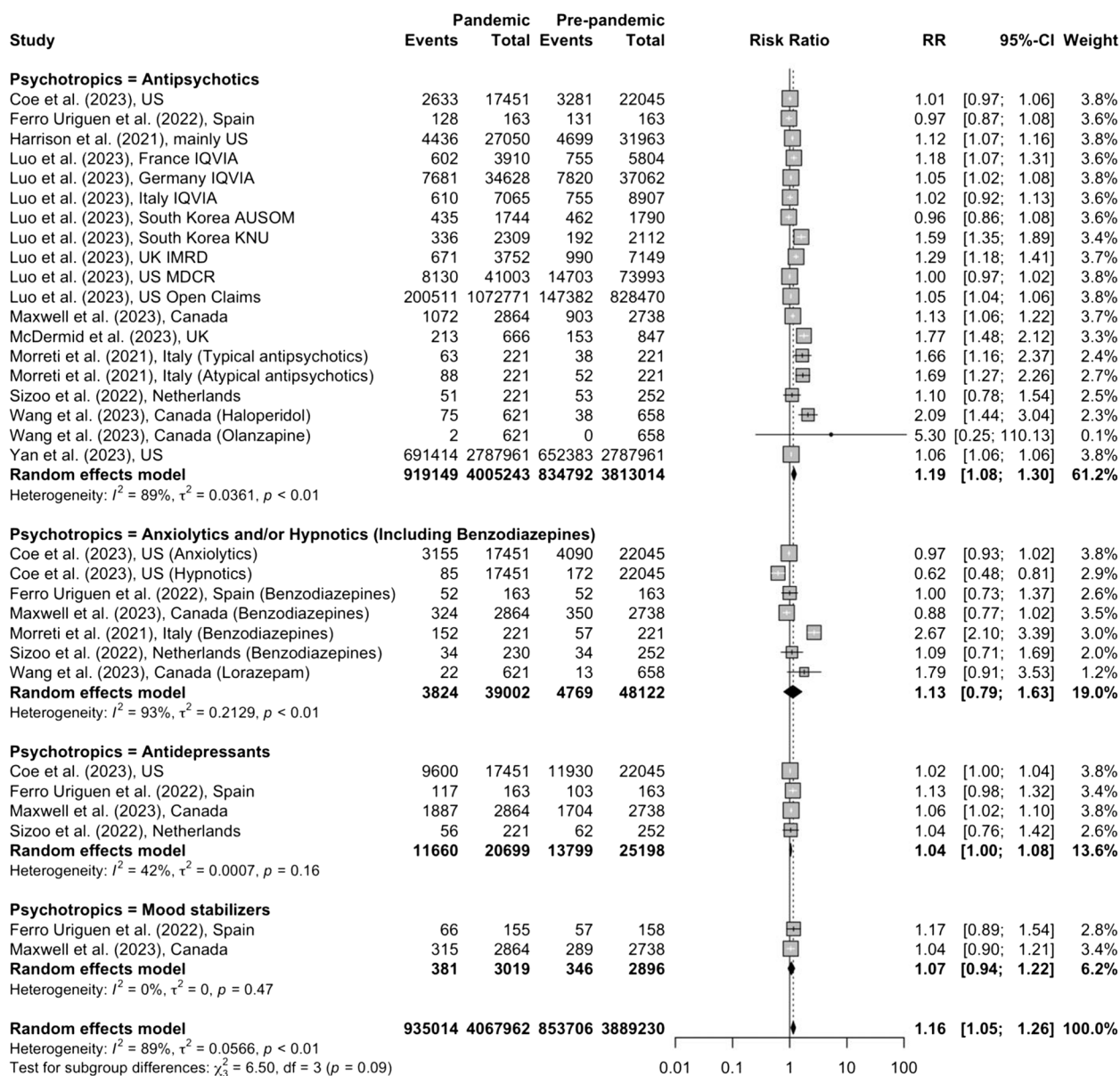


Fig. 2 RRs of psychotropic use for BPSD during the COVID-19 pandemic compared to the pre-pandemic period

and caregiver-related factors [34], higher cancellation rates of social activities in NHs were directly related to the proportion of staff with COVID-19 infection and to staff shortages [37]. Several pre-pandemic studies have examined factors influencing psychotropic use in older adults with dementia including patient factors (e.g., age, dementia severity), caregiver factors (e.g., caregiver’s burnout, BPSD care knowledge, nurse staffing), and environment-related factors (e.g., urban location, socio-economic status, bed size) and can provide important pre-pandemic data on psychotropic use-related factors [6, 66–70].

The importance of exploring multiple factors of psychotropic use other than the occurrence of the pandemic is highlighted in comparing between- or within- countries’ results. For example, large differences in the prevalence of antipsychotic use for NH residents with dementia between these two multinational studies were noted [17, 34] (18% [34] vs. 80.5% [17] in the pre-pandemic period and 32% [34] vs. 78.2% [17] in the pandemic period) and a consistently higher prevalence throughout both periods could be due to data collection from psychogeriatric NHs with high-intensity BPSD related to severe cognitive impairment [17]. However, both studies

lacked information on dementia types, BPSD severity, and caregiver- or facility-related factors to compare determinants of antipsychotic use. Also, different studies conducted within the same country reported significantly heterogeneous prevalences of psychotropic use (e.g., South Korea AUSOM vs. South Korea KUN [42] and studies in Canada [26, 36]). Although different study sample sizes and settings, such as locations (e.g., urban areas vs. others [26, 36, 42]), LTC types (AL [26] vs. NHs [36]), and regular and PRN psychotropic use assessment [26] vs. PRN use only [36] can lead to different prevalence rates, it is still challenging to compare within countries' results due to a lack of patient, caregiver, and environmental-related factors.

Limitations

Limitations in this review can be a lack of methodological rigor in defining samples' characteristics and conditions as indicated by JBI quality appraisal. Further research needs well-characterized samples with cognitive impairment levels, types of dementia, and frequency and severity of BPSD. Among the reviewed studies, although Cohen et al. [40] found no significant relationship between psychotropic use and dementia severity, anxiety, depression, and insomnia were more prevalent in people with mild or moderate dementia compared to those with severe dementia. Regarding dementia types, Schnier and colleagues [35] found the highest proportion of prescribed antipsychotic medications among those with Alzheimer's disease compared to other types, consistent with the research of Xiong and colleagues [71]. Also important is to assess any changes in the provision of non-pharmacological interventions for those with dementia during the pandemic.

Because psychotropics are also used to manage behavioral symptoms related to psychiatric or neurological disorders (e.g., schizophrenia, bipolar disorders, Huntington's disease), the lack of patient assessment for these indications for psychotropic use should be noted as a limitation. Furthermore, some studies relied on self-reported rates of psychotropic use by caregivers or others, thus responses could be affected by recall or subjective biases. Finally, there is little research on the use of other types of psychotropics. Given that mood stabilizers (e.g., valproic acid) are often used as an alternative to antipsychotics, more research is needed to explore their consequences, given their more serious and potentially life-threatening side effects compared to antipsychotics [72].

Moreover, regarding the review process, only published articles written in English were included, which might have led to the omission of potentially relevant studies. As COVID-19 rapidly became a pandemic, some publications written in languages of significantly affected

countries (e.g., China, Italy) might have been missed [73]. Meta-analysis was conducted with 10 articles of the 15 selected because some studies used qualitative and mixed-methods so psychotropic use prevalence rates were unavailable.

Implications

This review highlights the importance of healthcare professionals as well as formal/informal caregivers to understand that care for BPSD may be more challenging during the pandemic in relation to national-level lockdowns, compromised delivery of regular rehabilitation, and the withdrawal of medical consultants [20, 40, 74]. There may have been a greater reliance upon psychotropic use among older adults with dementia from acute healthcare settings to those living in the community. Thus, policies are needed to ensure medical counsel on a regular basis, social service support, and widespread sharing of resources in the event of a pandemic. In LTC settings, protocols to review drug dosages and monitor the efficacy of prescribed psychotropics should be developed to facilitate regular assessments and reduce the adverse effects of psychotropics. Strategies to reduce unnecessary psychotropic use and provide non-pharmacological interventions are needed, such as alternative interventions in online or virtual formats, to promote appropriate BPSD care [75].

Conclusions

This systematic review and meta-analysis explored changes in psychotropic prescriptions during the pandemic. This review showed slightly increased psychotropic use in relation to the pandemic, specifically indicating higher risks of antipsychotic use compared to other psychotropic medications. The review suggests more prevalent psychotropic prescribing during the pandemic, but the underlying reasons in terms of patients, caregivers, and environmental-related factors are not fully available from the reviewed studies. Some studies lacked methodological rigor in identifying sample characteristics. As previous studies examined specific factors related to psychotropic use, there is a need to develop targeted research to clearly understand the driving factors of psychotropic use along with the pandemic crisis. Also, further research needs to be conducted in the post-pandemic period (after May 5, 2023) [76] to determine whether elevated psychotropic use has been sustained.

Abbreviations

AD	Absolute difference
ADL	Activities of daily living
AL	Assisted living
AUSOM	Ajou University School of Medicine database
BPSD	Behavioral and psychological symptoms of dementia
CI	Confidence interval

COVID-19	Coronavirus disease 2019
IMRD	IQVIA Medical Research Data
JB1	Joanna Briggs Institute
KUN	Kangwon National University
LTC	Long-term care
MDCR	IBM MarketScan Medicare Supplemental and Coordination of Benefits Database
NH	Nursing home
PR	Prevalence ratio
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta Analyses
RR	Risk ratio
SC	Slope change

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12877-024-05563-4>.

Additional file 1. Search strategies.

Additional file 2. Quality appraisal of included studies based on JB1 (Joanna Briggs Institute) Critical Appraisal tools.

Additional file 3. Overview of included studies on changes in psychotropic use for BPSD during the COVID-19 pandemic.

Additional file 4. Sensitivity analyses on the pooled RR of psychotropic use for BPSD during the COVID-19 pandemic compared to the pre-pandemic period.

Additional file 5. Funnel plot of risk ratios and standard errors among the studies included in meta-analysis.

Additional file 6. PRISMA 2020 Checklist.

Acknowledgements

Not applicable.

Authors' contributions

JMY contributed to the conception and design of the study. JMY and EK performed the literature search, quality assessment, extraction, analysis and interpretation of the data. All authors (JMY, EK, and AMT) were involved in drafting the manuscript and revising it critically for important intellectual content. All authors approved the submitted version of the final manuscript.

Funding

This study was supported by the National Research Foundation of Korea (NRF) funded by the Ministry of Science, ICT & Future Planning (Grant number: RS-2023-00277604, PI: Jung Min Yoon). Also, this study was supported by the Ewha Womans University Research Grant of 2023.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on a reasonable request.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹College of Nursing, Ewha Womans University, Jinseonmi-Gwan, Room 329, 52, Ewhayeodae-Gil, Seodaemun-Gu, Seoul 03760, Republic of Korea. ²College of Nursing, Ewha Womans University, Seoul, Republic of Korea. ³University of Maryland School of Nursing, Baltimore, MD 21201, USA.

Received: 1 June 2024 Accepted: 12 November 2024

Published online: 21 November 2024

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