**eMethod 1. PRISMA guidelines**

Despite the research protocol of the Umbrella review not being registered, we followed the PRISMA guidelines for meta-analysis and systematic reviews.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section and Topic**  | **Item #** | **Checklist item**  | **Location where item is reported**  |
| **TITLE**  |  |
| **Title** | **1** | **Identify the report as a systematic review.** | **Title** |
| **ABSTRACT**  |  |
| **Abstract** | **2** | **See the PRISMA 2020 for Abstracts checklist.** | **Abstract** |
| **INTRODUCTION**  |  |
| **Rationale** | **3** | **Describe the rationale for the review in the context of existing knowledge.** | **Introduction** |
| **Objectives** | **4** | **Provide an explicit statement of the objective(s) or question(s) the review addresses.** | **Introduction** |
| **METHODS**  |  |
| **Eligibility criteria**  | **5** | **Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.** | **Method** |
| **Information sources**  | **6** | **Specify all databases, registers, websites, organisations, reference lists other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.** | **Method** |
| **Search strategy** | **7** | **Present the full search strategies for all databases, registers and websites, including any filters and limits used.** | **Method, eTable1** |
| **Selection process** | **8** | **Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.** | **Method** |
| **Data collection process**  | **9** | **Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.** | **Method** |
| **Data items**  | **10a** | **List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.** |  **Method** |
| **10b** | **List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.** | **Method** |
| **Study risk of bias assessment** | **11** | **Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.** | **Method, eMethod 2** |
| **Effect measures**  | **12** | **Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.** | **Method** |
| **Synthesis methods** | **13a** | **Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).** | **Method** |
| **13b** | **Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.** | **Method** |
| **13c** | **Describe any methods used to tabulate or visually display results of individual studies and syntheses.** | **Method** |
| **13d** | **Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.** | **Method, eMethod 2** |
| **13e** | **Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).** | **Method, eMethod 2** |
| **13f** | **Describe any sensitivity analyses conducted to assess robustness of the synthesized results.** | **Method, eMethod 2** |
| **Reporting bias assessment** | **14** | **Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).** | **Method, eMethod 2** |
| **Certainty assessment** | **15** | **Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.** | **Method, eMethod 2** |
| **RESULTS**  |  |
| **Study selection**  | **16a** | **Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.** | **Results** |
| **16b** | **Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.** | **Results** |
| **Study characteristics**  | **17** | **Cite each included study and present its characteristics.** | **Results, eResults 1** |
| **Risk of bias in studies**  | **18** | **Present assessments of risk of bias for each included study.** | **Results, Table 1 and 2** |
| **Results of individual studies**  | **19** | **For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.** | **Table 1 and 2** |
| **Results of syntheses** | **20a** | **For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.** | **Results** |
| **20b** | **Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.** | **Results, Table 1** |
| **20c** | **Present results of all investigations of possible causes of heterogeneity among study results.** | **Results** |
| **20d** | **Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.** | **Results** |
| **Reporting biases** | **21** | **Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.** | **Results** |
| **Certainty of evidence**  | **22** | **Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.** | **Results** |
| **DISCUSSION**  |  |
|  | **23a** | **Provide a general interpretation of the results in the context of other evidence.** | **Discussion** |
| **23b** | **Discuss any limitations of the evidence included in the review.** | **Discussion** |
| **23c** | **Discuss any limitations of the review processes used.** | **Discussion** |
| **23d** | **Discuss implications of the results for practice, policy, and future research.** | **Discussion** |
| **OTHER INFORMATION** |  |
| **Registration and protocol** | **24a** | **Provide registration information for the review, including register name and registration number, or state that the review was not registered.** | **eMethod 1** |
| **24b** | **Indicate where the review protocol can be accessed, or state that a protocol was not prepared.** | **eMethod 1** |
| **24c** | **Describe and explain any amendments to information provided at registration or in the protocol.** | **Not available**  |
| **Support** | **25** | **Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.** | **Funding** |
| **Competing interests** | **26** | **Declare any competing interests of review authors.** | **Conflict of interest** |
| **Availability of data, code and other materials** | **27** | **Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.** | **Table 1 and 2** |

**eMethod 2. AMSTAR-2 and evaluation of evidence**

AMSTAR 2 tool was used to evaluate the content and the potential biases of the included studies, related to the search strategy, heterogeneity, and publication bias according to the following criteria [1]:

High: No or one non-critical weakness: the systematic review provides an accurate and comprehensive summary of the results of the available studies that address the question of interest

Moderate: More than one non-critical weakness: the systematic review has more than one weakness but no critical flaws. It may provide an accurate summary of the results of the available studies that were included in the review

Low: One critical flaw with or without non-critical weaknesses: the review has a critical flaw and may not provide an accurate and comprehensive summary of the available studies that address the question of interest

Critically low: More than one critical flaw with or without non-critical weaknesses: the review has more than one critical flaw and should not be relied on to provide an accurate and comprehensive summary of the available studies

We stratified the evidence provided by each meta-analysis for their primary outcome following the Criteria for Credibility-of-Evidence Classification in Observational Studies Classification Criteria [2].

 Convincing evidence (class I)

• >1000 Cases
 • Significant summary associations (P < 10−6) per random-effects calculations
 • No evidence of small-study effects
 • No evidence of excess of significance bias
 • Prediction intervals not including the null value
 • No large heterogeneity (ie, I2 < 50%)

Highly suggestive evidence (class II)

• >1000 Cases
 • Significant summary associations (P < 1 × 10−6) per random-effects calculation
 • Largest study nominally significant (P < .05)

• Class I criteria not met

Suggestive evidence (class III)

• >1000 Cases
 • Significant summary associations (P < 1 × 10−3) per random-effects calculations

• Class I-II criteria not met

Weak evidence (class IV)

• p < 0.05 and class I-III criteria not met

Nonsignificant association (NS) • p > .05

**eTable 1. Systematic search strategies.**

|  |  |  |
| --- | --- | --- |
| Database | Search syntax | Number of identified documents |
| PubMed | ("psychiatr\*"[Title/Abstract] OR "mental"[Title/Abstract]) AND ("COVID"[Title/Abstract] OR "SARS-CoV-2"[Title/Abstract]) AND ("infection"[Title/Abstract] OR "susceptibility"[Title/Abstract] OR "hospital"[All Fields] OR "intensive care"[Title/Abstract] OR "emergency department"[Title/Abstract] OR "mortality"[Title/Abstract] OR "death"[Title/Abstract] OR "severe"[Title/Abstract]) AND ("risk"[Title/Abstract] OR "predictor"[Title/Abstract]) AND ("meta-analysis"[Title/Abstract] OR "review"[Title/Abstract]) | 297 |
| Web of Science | TS=(psychiatr\* OR mental) AND TS=(COVID OR SARS-CoV-2) AND TS=(infection OR susceptibility OR hospital\* OR intensive care OR emergency department OR mortality OR death OR severe) AND TS=(risk OR predictor) AND TS=(meta-analysis OR review) | 350 |
| Ovid/PsycINFO | AB ( psychiatr\* OR mental ) AND AB ( COVID OR SARS-CoV-2 ) AND AB ( infection OR susceptibility OR hospital\* OR intensive care OR emergency department OR mortality OR death OR severe ) AND AB ( risk OR predictor ) AND AB ( meta-analysis OR review )  | 51 |

**eResults 1**. **Description of the comprehensive studies**

Liu and colleagues published a systematic review and meta-analysis exploring associations between risk of COVID-19 infection, illness severity and mortality and mental and neurological disorders, both pre-existing and subsequent [3]. Fond et al. presented a systematic review and meta-analysis exploring the risks of COVID-19-related mortality, or intensive care unit (ICU) admission in patients with mental disorders [4]. Vai et al. published an independent systematic review and meta-analysis exploring risks associated with COVID-19 mortality, ICU admission, or hospitalization outcomes [5]. Ceban and colleagues provide a systematic review and meta-analysis focused on the risk of COVID-19 infection, hospitalization, severe outcomes or death in mood disorders [6]. Toubasi et al. explored the meta-analytic risk of severe COVID-19 (i.e., a combined measure of mortality and ICU admission) associated with mental disorders [7]. Karaoulanis and Christodoulou conducted a systematic review investigating the risk of COVID-19 infection and mortality in patients with schizophrenia spectrum disorders [8]. Murthy and Narasimha reported literature about the risk of COVID-19 infection in alcohol users using a systematic review [9]. Fornaro et al. presented a scoping review exploring the implications of the COVID-19 pandemic on people with bipolar disorder, however, they reported only one original study investigating the risk of SARS-CoV-2 infection [10].

​​Following AMSTAR-2 guidelines, 2 comprehensive studies were rated as moderate quality [7, 11], 3 as low quality [8-10] and 3 as critically low quality [12-14]. In detail, Liu et al. and Vai et al. papers were rated as moderate considering the presence of more than one non-critical weaknesses (items 3 and 10, see below for items description). Ceban et al., Fond et al., and Toubasi et al. papers were rated as low quality for the lack of a single critical domain (Item 7) in addition to others non critical weaknesses (Item 3 and 10). Finally, the presence of more than one critical weaknesses caused the classification as critically low quality of the manuscripts by Fornaro et al. (“Partial Yes”for Items 2 and 4, and “no meta-analysis conducted” for items 9, 11, 13, 15), Karaoulanis et al. (“no” for items 2, 4, and 7 and “no meta-analysis conducted “for items 9, 11, 13, 15), and Murthy et al. (“no” for items 2, 4, and 7 and “no meta-analysis conducted” for items 9, 11, 13, 15). In detail, the individual items found to be lacking in the included meta-analyses and reviews dealt with:

Item 2 - Protocol registered before commencement of the review

Item 3 - Selection of the study designs for inclusion in the review

Item 4 - Adequacy of the literature search

Item 7 - Justification for excluding individual studies

Item 9 - Risk of bias from individual studies being included in the review

Item 10 - Report on the sources of funding for the studies included in the review

Item 11 - Appropriateness of meta-analytical methods

Item 13 - Consideration of risk of bias when interpreting the results of the review

Item 15 - Assessment of presence and likely impact of publication bias

**eResults3. Online Surveys**

Recommendations are developed considering findings from two online survey:

(1) a report on the involvement of psychiatric professionals in the national vaccination strategies conducted by representatives of national psychiatric associations of the EPA Council;

(2) an evaluation by UEMS-Psychiatry of the effects of the pandemic on training and practice of psychiatrists in 18 European countries.

**eResults 3.1 EPA Council report**

In April 2021, we conducted an online survey among representatives of national psychiatric associations of the EPA Council of NPAs to gauge the state of countries’ consideration for patients with mental illness and involvement of psychiatrists in the national vaccination strategies. We received responses from fourteen countries: Austria, Belgium, Bosnia and Herzegovina, Croatia, Georgia, Germany, Ireland, Poland, Slovakia, Spain, Switzerland, Turkey, and UK. Considering onnline survey among representatives of national psychiatric associations of the EPA Council, half of the respondents (7 of 14 countries) indicated that their national vaccination strategy prioritized patients with mental illness based on their living situation, rather than on their medical condition (5/14), disability status (2/14) or risk behaviour (2/14). Four countries indicated no priority had been given to patients with mental disorders. In countries where non-institutionalised patients with mental illness were eligible for priority vaccination, patients were identified through a mix of centralised registration systems (sometimes needing a patient to register themselves as at-risk individual) and treating general practitioners and psychiatrists. The involvement of psychiatrists in the development and implementation of national pandemic policies differed between countries. In six countries, psychiatrists were involved in the identification of individual at-risk patients eligible for priority vaccination, but only in four countries were psychiatrists involved in the development of the national vaccination strategy or in the actual distribution of vaccines to patients with mental illness. Importantly, the majority of NPAs who responded to the survey reported having engaged in advocacy efforts to include prioritization of patients with mental illness in the vaccination strategy (11/14), in less than half of cases (partially) successfully (5/11).

**eResults 3.2 UEMS-Psychiatry evaluation**

The Section of Psychiatry of the European Union of Medical Specialists (UEMS-Psychiatry) conducted an evaluation amongst its member countries of the effects of the pandemic on training and practice of psychiatrists in Europe. In October 2020, UEMS-Psychiatry invited its national delegates to answer the question “How has COVID-19 impacted on training and Continuous Professional Development in Europe?”. This was done at the biannual meeting in a plenary session. Representatives of 18 countries took part in the session: Austria, Belgium, Croatia, Denmark, Estonia, Germany, Greece, Ireland, Finland, The Netherlands, Norway, Poland, Romania, Slovakia, Spain, Sweden, Turkey, UK. They described changes in practice and reported the challenges and opportunities created by the pandemic, which are relevant to patient outcomes. Many countries saw a drop in acute admissions with earlier discharge to free up space for COVID-19 wards. Outpatients' activities decreased and switched to online consultations. Emergency departments saw decreased activity in general. Technical barriers were quickly overcome, as well as legislative ones (e.g. health insurance providers now recognise online consultations - previously not allowed).

The main challenges highlighted in the evaluation have been associated with absences due to illness, quarantine or shielding, and redeployment (forced or voluntary) to different psychiatric teams or other medical specialties. They also described positive developments such as the rapid adoption of technology for both service provision and training, including virtual assessments, team meetings, journal clubs, and supervision.

**References**

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[3] Liu L, Ni S-Y, Yan W, Lu Q-D, Zhao Y-M, Xu Y-Y, et al. Mental and neurological disorders and risk of COVID-19 susceptibility, illness severity and mortality: A systematic review, meta-analysis and call for action. EClinicalMedicine. 2021;40:101111.

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