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Access and use of general and mental health services before and during the COVID-19 pandemic: a systematic review and meta-analysis

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ABSTRACT

Objectives To quantify access to health services during the COVID-19 pandemic and measure the change in use between the prepandemic and the pandemic periods in a population with assessment of psychological distress or diagnosis of mental disorders.

Data sources We developed and piloted a search syntax and adapted it to enter the following databases from 1 January 2020 to 31 March 2023: PubMed/MEDLINE, PsycINFO, Web of Science, Epistemonikos and the WHO International Clinical Trials Registry Platform. We reran the searches from the end of the original search to 3 December 2024.

Design We systematically screened titles, abstracts and full texts of retrieved records.

Eligibility criteria We included observational studies on any populations and regions, covering health services such as doctor visits, hospital admissions, diagnostic examinations, pharmaceutical therapies and mental health (MH) services. Only studies using validated scales to assess psychological distress or mental disorders as defined in the Diagnostic and Statistical Manual of Mental Disorders were included.

Data extraction and synthesis We extracted data using a purposefully designed form and evaluated the studies' quality with the Newcastle-Ottawa Scale. We measured the incidence rate (IR) of access to health services and the IR ratio (IRR) between the prepandemic and the pandemic periods. We calculated contacts days and catchment areas in the different periods. We used the random effects DerSimonian-Laird inverse-variance model and calculated heterogeneity with statistics I^2 and τ^2. We computed pooled IR and pooled IRR and tested the hypothesis of no variation (IRR=1).

Results We retrieved 10 014 records and examined the full text of 580 articles. We included 136 primary studies of which 44 were meta-analysed. The IR of access to services during the pandemic was 2.59 contact months per 10 000 inhabitants (IR=2.592; 95% CI: 1.301 to 5.164). We observed a reduction of 28.5% in the use of services with negligible differences by age group and type of services (IRR=0.715; 95% CI: 0.651 to 0.785). We observed significant differences in effect sizes across studies (τ^2=5.44; p<0.001 and τ^2=0.090; p<0.001).

Conclusion By considering MH, our study provides consolidated evidence and quantifies the reduction in the use of health services during the COVID-19 pandemic.

PROSPERO registration number CRD42023403778.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Our review provides novel evidence on the association between mental health (MH) and the use of health services, focusing on populations with assessment of psychological distress or diagnosis of mental disorders. It includes studies from high-income and low- and middle-income countries.
⇒ The study's internal validity is strengthened by advanced statistical analyses, standardised procedures and rigorous quality assessments, ensuring reliability and minimising bias.
⇒ The included studies were conducted during different pandemic waves and across various countries, adding complexity to the consistency of outcomes.
⇒ The search was limited to five databases, language restrictions were applied; it was completed in March 2023, indicating the need for an update by the end of 2025.

INTRODUCTION

The use of health services depends on the synergy between service characteristics such as availability, accessibility and acceptability and the health-seeking behaviours of the population.[1] The COVID-19 pandemic provides a unique opportunity to quantify variations in the use of health services driven by the interplay of an unprecedented reorganisation of services[2–5] and a concomitant increase in mental health (MH) needs within the population. Globally, the reallocation of healthcare resources towards COVID-19 treatment coupled with the need to prevent in-hospital viral transmission significantly reduced the capacity for both elective and emergency procedures.[6] Numerous studies

have documented substantial declines in emergency department visits,[7] hospital admissions for acute medical conditions, including cardiovascular and coronary heart diseases,[8 9] and presentations for MH conditions,[10–15] along with reduced outpatient care contacts for physical health conditions.[16–19] Besides, the pandemic has exerted a considerable and complex impact on the population's MH.[2 20–27] Studies conducted since the outbreak reported rising rates of Common Mental Disorders (CMDs) such as depression, anxiety and stress within the general population. These increases have been attributed to several factors, including uncertainty about the pandemic's progression, the risk of infection, quarantine directives, social isolation, inactivity and income loss.[28 29] However, the direction of the association between MH and the use of health services during the pandemic remains uncertain, as high levels of psychological distress within the population may be linked to both positive and negative attitudes towards seeking care.[30] In this context, a systematic synthesis of the evidence on the impact of the pandemic on the use of health services while also accounting for MH is lacking. The evidence is dispersed across a vast array of publications, and available studies have heterogeneity in outcome measures, settings and methodological approaches.[21] Our goal was to consolidate evidence on the impact of the COVID-19 pandemic on the use of health services, providing a sound overview of available studies. Moreover, we aimed to fill the gap concerning the unclear association between MH and the use of health services by contemplating two approaches: focusing on a population with assessment of psychological distress or diagnosis of mental disorders and differentiating the use of general health services (ie, non-MH services) and MH services. The aims of this systematic review were (O1) to quantify the use of both general health and MH services during the COVID-19 pandemic and (O2) to assess the change in use of both general health and MH services between the prepandemic and the pandemic periods. We hypothesised that the pandemic has had an impact on the use of health services in several ways. On one hand, the adverse effects of COVID-19 on MH might have caused greater demand for care provision[31]; on the other hand, fear of infection, lack of outpatient care and non-availability of treatment in hospital settings might have prevented patients from seeking and using care.[32] Understanding how the population used services is crucial to prioritise short- and long-term healthcare strategies and mitigating adverse physical and MH consequences of public health (PH) emergencies.[33]

METHODS

The protocol for this review was registered in the International Prospective Register of Systematic Reviews, registration number CRD42023403778. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines for preparing the manuscript.

Data source

We developed and piloted a search syntax (online supplemental material) and adapted it to enter the following databases from 1 January 2020 to 31 March 2023: PubMed/MEDLINE, PsycINFO, Web of Science, Epistemonikos and the WHO International Clinical Trials Registry Platform. We hand-searched the reference lists of potentially relevant studies and considered additional studies suggested by the authors. We reran the searches with the exact syntax across the databases with specifications of dates between the end of the original search and 3 December 2024.

Study selection

We used the Population, Exposure, Outcome and Study Design framework to define the study selection. Inclusion criteria were: (a) observational studies; (b) study populations of any age, gender and subpopulation groups, such as minorities, patients with pre-existing psychological distress or mental disorders defined in the Diagnostic and Statistical Manual of Mental Disorders, 5th edition, Text Revision[34] and other pre-existing clinical conditions; (c) setting: studies carried out in any geographic region, as classified by the World Bank's 2022–2023 country income levels ranging from low- and middle-income to high-income[35]; (d) type of health service: doctor visits, hospital admissions, diagnostic examinations and screenings, pharmaceutical therapies (intakes) and MH services (both inpatient and outpatient visits carried out by MH professionals such as psychiatrists, psychologists and psychotherapists); (e) studies that applied validated scales, which either directly assessed psychological distress or diagnosed mental disorders. In studies reporting assessment of psychological distress or diagnosis of mental disorders, we examined the use of both general health and MH services. In studies assessing psychological distress or diagnosis of mental disorders, we exclusively considered the use of MH services and (f) outcome measures reported by caregivers or other healthcare professionals instead of patients. Exclusion criteria were: (a) studies conducted in selected professional groups in which the MH burden of the pandemic was work-related; (b) studies reporting non-quantitative data, or information on referrals but not actual admissions, or prescriptions without information on actual intakes; (c) studies reporting generic questions about patients' status (eg, How do you feel today?) for the assessment of psychological distress; (d) studies retracted from publication and (e) studies published in languages other than English, Italian, French. After retrieving the records by bibliographic database search, we used the reference management databases EndNote[36] and Rayyan[37] to manage the screening, store and organise the references and remove duplicates. Three independent reviewers (CS, BB and EP) screened titles, abstracts and then the full texts of retrieved records. Disagreements were resolved by consensus with senior authors (MP and EA). The per cent agreement among reviewers prior to full-text screening was 82.15%.

Data extraction and synthesis

CS, BB and EP independently extracted data on primary studies' characteristics and results using a purposefully designed extraction form implemented in Microsoft Excel. We contacted the authors to supply data in predefined, analysis-ready formats when the data were incomplete or unclear. We performed periodic checks to ensure the quality of data extractions and resolved disagreements through discussion with the full review team (CS, BB, EP, MP and EA). Two senior reviewers in MH (MP and EA) supervised the extraction, randomly checking 20% of the extracted data. Given the nature of the study, ethics approval was not applicable. CS, BB and EP independently evaluated the quality of the included studies using the Newcastle-Ottawa Scale (NOS) for observational studies.[38] First, the full review team minimally adapted the NOS to the specificity of the research questions, and to the design and features of relevant primary studies. Next, a senior reviewer (EA) provided structured training and supervision to guide the screeners in applying the NOS appropriately, consistently and uniformly. Finally, the full review team conducted follow-up meetings to discuss uncertainties and resolve conflicts on the interpretation and adaptation of the scale.

Main outcomes and measures

The primary outcome of this review was the use of health services during the COVID-19 pandemic. We measured access as a single contact with a health service. The incidence rate (IR) of the use of health services was measured as the number of accesses (eg, number of admissions or treatments) registered in a specific time divided by contact months, that is, the product between the population size of the catchment area specific to each service and the number of months observed. The rate was quantified at a single time point to analyse both measures of services used in the prepandemic period (up until March 2020) and during the pandemic period. The pandemic period was counted as defined by the authors of the primary studies, ensuring it was close to the dates on which the WHO declared the outbreak.[39] We calculated the number of accesses, allowing for multiple accesses per person (recurrent events), while controlling for differences in the observation days. We calculated contacts day using the number of contacts with services and catchment areas in different periods. The secondary outcome was the change in the use of health services between the prepandemic and pandemic periods. This outcome was expressed as the IR ratio (IRR) and quantified as the number of accesses per time unit. We conducted two sets of meta-analyses. We used the Stata metan module [40] for statistical analyses. We used random effects DerSimonian-Laird (DL) inverse-variance models as we expected between-study heterogeneity due to the variety of populations, their characteristics and outcome measures. Heterogeneity across studies was calculated with statistics I^2[41] and τ^2 and its statistical significance was assessed through Cochran's Q. For the primary outcome, we pooled aggregated data on the use of health services; since we assumed a log-normal distribution, rates were transformed into logarithms. We computed the pooled IR from primary studies and calculated the 95% CI by choosing as a unit of measurement the contact-month rate for 10 000 inhabitants. For the secondary outcome, we pooled aggregated data on the during-pre ratio of rates of use of health services. We computed the pooled IRR of service used in the two periods with a related 95% CI and tested the hypothesis of no variation (IRR=1). To assess potential causes of heterogeneity, we conducted subgroup meta-analyses on the following variables: (a) population age groups, that is, children and adolescents (aged <18 years) versus adults (aged ≥18 years) versus mixed population age groups and (b) type of health service, that is, MH services versus general health services. We measured both within and between subgroups heterogeneity; the statistical significance of the latter was used to test for heterogeneous results across subgroups. As described in the protocol of this review, we collected data and performed a moderation analysis to evaluate whether the assessment of psychological distress or diagnosis of mental disorders during the pandemic moderated the use of health services. We will present such results elsewhere.

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Characteristics of included studies

The electronic search yielded a total of 10 014 records. Before screening, we removed 5155 records because they were duplicates, leaving 4859 records for screening. We examined the full text of 580 studies and identified 281 as potentially eligible (figure 1). We included 136[26 42–153] studies in the review, of which 44 were meta-analysed. References to selected excluded studies are reported in the online supplemental material. The online supplemental tables 1.1 and 1.2 display selected characteristics of included studies. Of the 136 included studies, 108 were cross-sectional, 27 were cohort and 1 was case-control. 121 studies were conducted in high-income countries, while 15 were conducted in low- and middle-income countries.[36] Nineteen studies recruited children and adolescents, 35 recruited adults and 82 recruited a mixed population in terms of age. Seventy-nine studies examined populations consisting of patients with pre-existing mental disorders (eg, CMDs, substance use, eating disorders), as well as those with other clinical conditions (eg, cancer, cardiovascular diseases, physical disabilities); 21 focused on the general population. Furthermore, 36 studies included both the general population and populations with pre-existing mental disorders or clinical conditions. Sixty-three studies were conducted in hospital settings and 28 in community health services. Forty-five were categorised as 'multicentre' because they were conducted in both

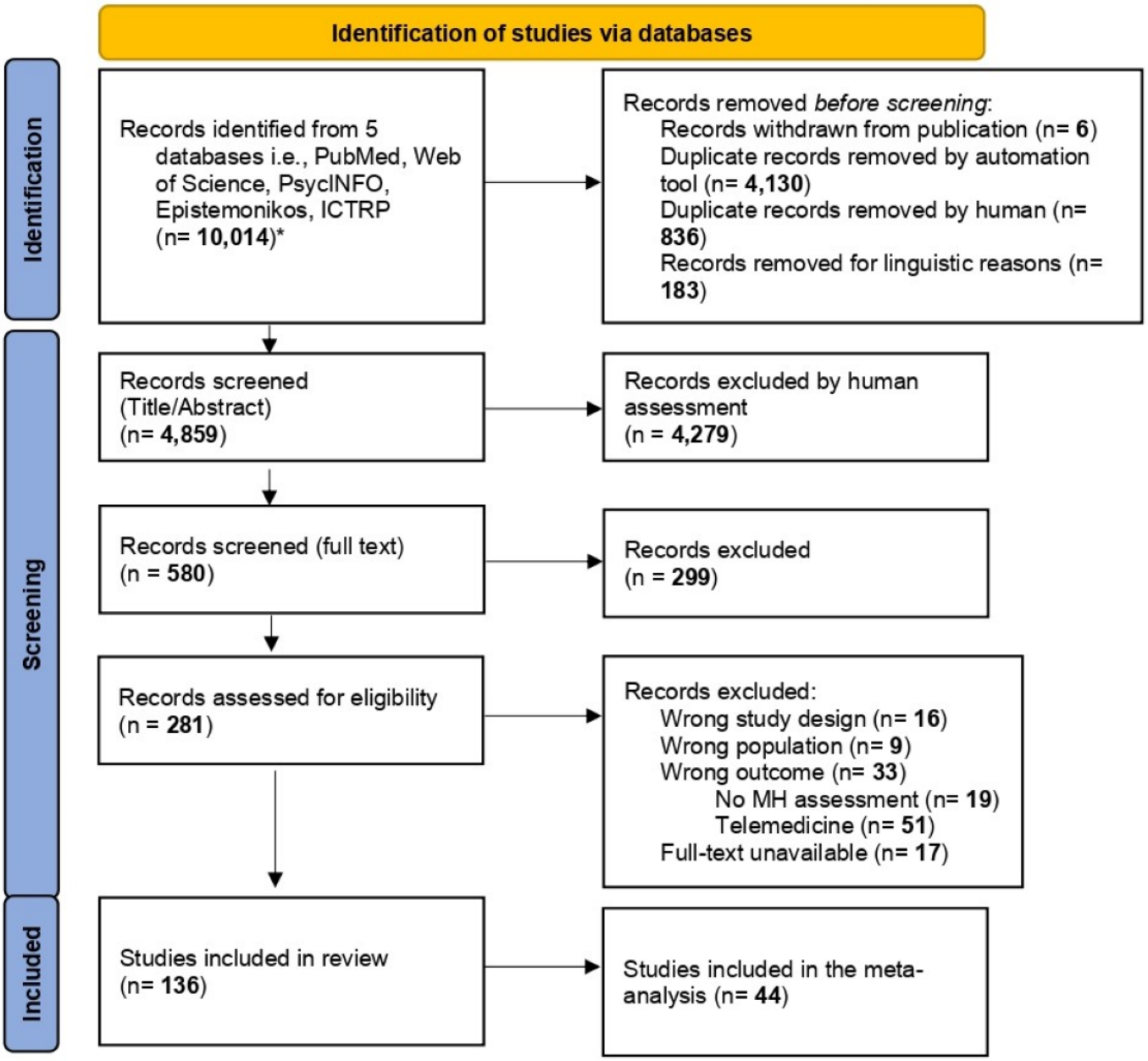

Figure 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 flow diagram for new systematic reviews, which included searches of databases ICTRP, International Clinical Trials Registry Platform; mental health.

hospital and community health settings. The outcome measures of 95 studies assessed the use of MH services, while 22 focused on the use of general health services. Nineteen examined the use of both general health and MH services. Of the studies included in the meta-analysis, mean observation days in the prepandemic period were 287 (range: 18–1461) and 227 (range: 28–490) in the pandemic period. The mean number of contacts in the prepandemic period was 661 649 (range: 25–27 224 568) and 582 442 (range 10–25 274 298) in the pandemic period. Studies did not vary substantially in quality (online supplemental tables 2–4): 28 studies met the criteria for quality assessment and 16 did not meet all quality criteria, still scoring a good overall.[154] The Egger's test provided support to the unlikelihood of publication bias (p=0.769).

Rate of general health and MH services use

The meta-analysis of the primary outcome (44 studies) revealed that the IR of use of both general health and MH services during the COVID-19 pandemic was 2.59 contacts months per 10 000 inhabitants (overall IR=2.59; 95% CI: 1.30 to 5.16; I^2=100%) (figure 2). When exploiting Cochran's Q statistic, we observed a statistically significant difference in effect sizes across all studies included in the overall meta-analysis (τ^2=5.44; p<0.001).

Change in use of general health and MH services

When observing IRR between the prepandemic and the pandemic periods, the overall meta-analysis (42 studies) revealed a statistically significant (p<0.001) change in the use of both general health and MH services (overall

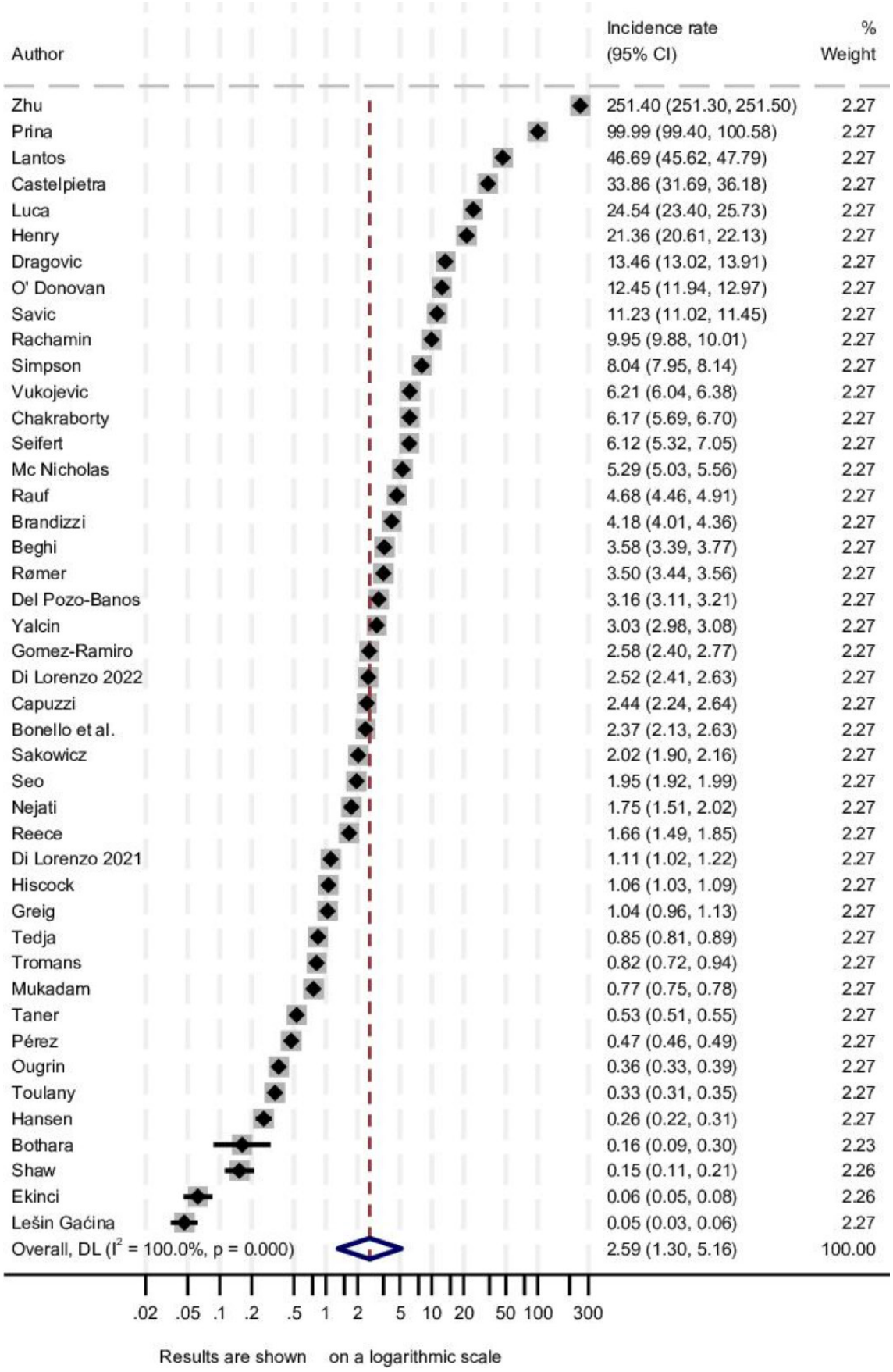

Figure 2 Rate of health services use (incidence rate). Overall meta-analysis pooling of aggregate data using the random-effects inverse-variance model with the DerSimonian-Laird (DL) estimate of τ^2. Results are shown on a logarithmic scale.

IRR=0.75; 95% CI: 0.65 to 0.79; I^2=99.9%) (figure 3). Thus, we identified a reduction of 28.5% in the use of health services during the pandemic. When exploiting Cochran's Q statistic, we observed a statistically significant difference in effect sizes across all included studies (τ^2=0.09; p<0.001). The comparative magnitude of between-study heterogeneity was considerable.

Subgroup analysis

Primary outcome

Subgroup analyses are reported in the online supplemental material. The subgroup meta-analysis on the variable (a) revealed that the rate of the use of health services during the pandemic in studies including a mixed population in terms of age (IR=3.50; 95% CI: 1.51 to 8.14) was higher than the rate of studies involving children and adolescents (IR=1.02; 95% CI: 0.23 to 4.51) and higher than the rate of studies involving adults (IR=2.69; 95% CI: 0.90 to 8.04). When exploiting Cochran's Q statistic, we observed statistically significant differences in effect sizes within subgroups. Yet the between-subgroup heterogeneity calculated using DL subgroup weights was not statistically significant (Q=2.01; df=2; p=0.366) (online supplemental figure 1.1). The subgroup meta-analysis on the variable 'type of health services revealed that, during the pandemic, the rate of MH services use was significantly higher (IR=2.86; 95% CI: 1.42 to 5.77) than the general health services rate (IR=0.69; 95% CI: 0.31 to 1.55); here, the between-subgroup heterogeneity calculated using DL subgroup weights was statistically significant (Q=6.76; df=1; p=0.009). When exploiting Cochran's Q statistic, we observed statistically significant differences in effect sizes within the subgroups (online supplemental figure 1.2).

Secondary outcome

The subgroup meta-analysis on the variable (a) revealed that studies including adults reported a decrease in the use of health services in the pandemic period compared with the prepandemic period (IRR=0.80; 95% CI: 0.66 to 0.98). The decrease in use was lower when compared with the change observed in studies involving children and adolescents (IRR=0.73; 95% CI: 0.48 to 1.11) and the change observed in studies involving a mixed population in terms of age (IRR=0.68; 95% CI: 0.61 to 0.76). Yet, the estimate of studies comprising children and adolescents was not significant (p=0.140), while it was for adults (p=0.027) and mixed (p<0.001) subgroups. When exploiting Cochran's Q statistic, we observed statistically significant differences in effect sizes within subgroups. The between-subgroup heterogeneity calculated using DL subgroup weights was not statistically significant (Q=2.09; df=2; p=0.35) (online supplemental figure 2.1). The subgroup meta-analysis on the variable (b) revealed that MH services presented a statistically significant lower change in use between the prepandemic and pandemic periods (IRR=0.71; 95% CI: 0.65 to 0.78) when compared with the change observed in the general health services use (IRR=0.82; 95% CI: 0.53 to 1.25). The between-subgroup heterogeneity calculated using DL subgroup weights was not statistically significant (Q=0.38; df=1; p=0.53). When testing subgroup effect size, there were statistically significant differences in effect sizes among the MH services subgroup (p<0.001), but no statistically significant differences in the effect size among the general health services subgroup (p=0.35). When exploiting Cochran's Q statistic, we observed statistically significant differences in effect sizes within the subgroups (online supplemental figure 2.2).

DISCUSSION

Our study provides a systematic synthesis of the evidence on the impact of the COVID-19 pandemic on the use of health services while accounting for MH. The 44 studies included in our meta-analysis were greatly heterogeneous and of adequate quality. The overall estimate revealed a reduction of 28.5% in the use of health services between the prepandemic and pandemic periods, with negligible and little difference by age group and type of service. Variance was fully dominated by its between-study component, also due to the population-level nature of the estimates, whose high precision led to a very low within-study variance. When meta-analysed subgroups did not meet statistical significance, such results are ascribable to the limited statistical power resulting from the small number of studies available within subgroups. The COVID-19 PH responses led to disruptions and reorganisations that affected the offer modalities, accessibility and availability of health services,[2–5] and our study stands in as a sound demonstration of a reduction in the use of services during that time. Our results significantly expand current evidence on decreasing hospital admissions, emergency presentations and outpatient care.[155 156] The drop in the use of services was ascertained both for physical health[7 18] and for MH conditions.[18 19 157 158] Reduced care contacts were reported in studies carried out in Europe and in other parts of the world[4 12 13 159–161]: French studies showed declined admissions[13] and halved emergency presentations for psychiatric disorders.[162] Similar findings were obtained in two German studies reporting a 27% decrease in emergency cases[163] and a 25% reduction in hospitalisations following the introduction of the PH measures.[164] A study from the UK[16] and a study from South Korea reported substantial reductions in outpatient care visits for MH conditions.[17] Similar findings were obtained in a study from Canada revealing a decline in hospital admissions and emergency presentations in children and adolescents.[165] Two studies from Italy and one study from the UK unveiled curtailed surgical and diagnostic procedures[166–168] across different care specialties. When looking at the standard framework for access to healthcare, which includes approachability and availability, as well as the ability to perceive and seek care,[1]

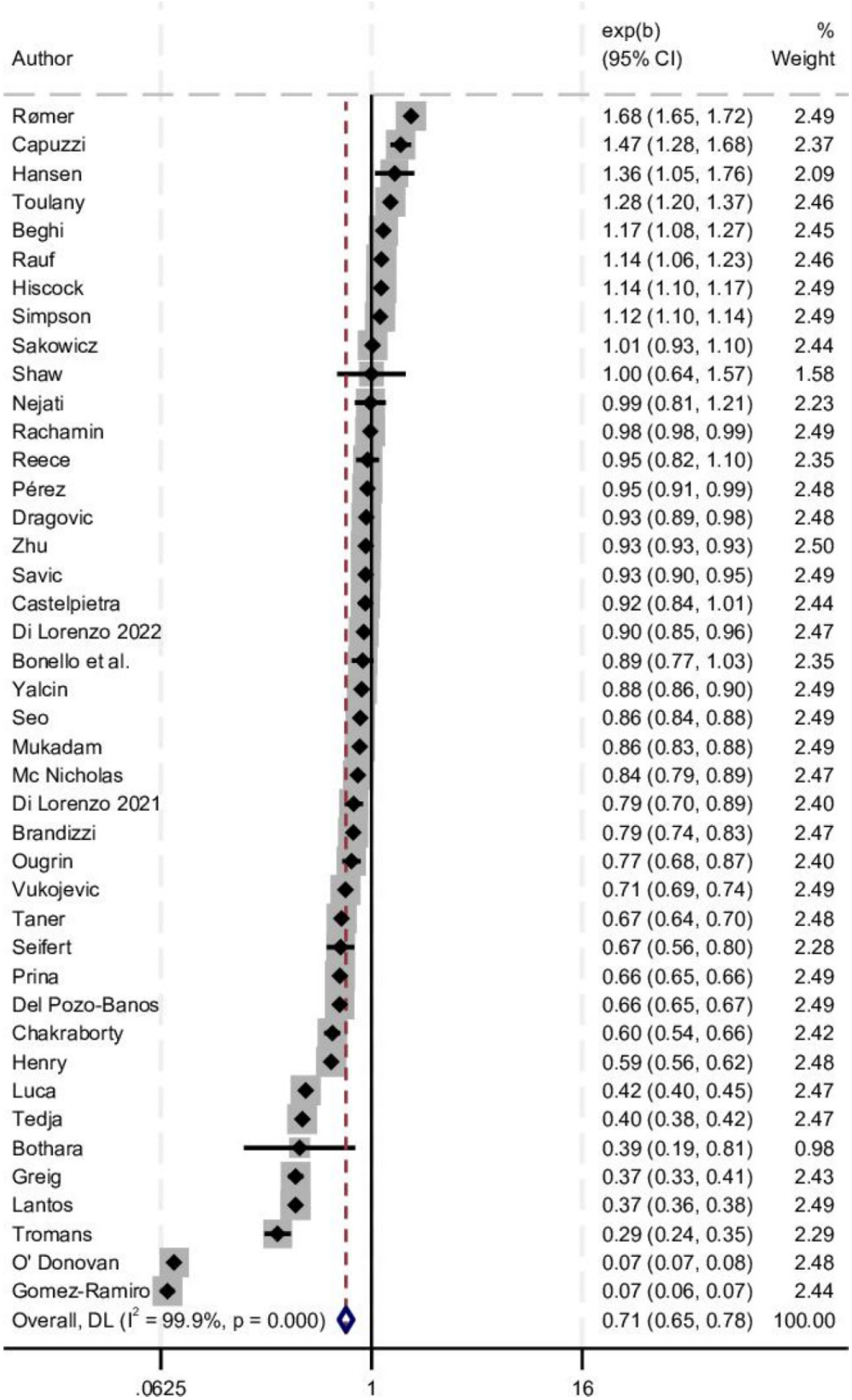

Figure 3 Change in use of health services (incidence rate ratio). Overall meta-analysis pooling of aggregate data using the random-effects inverse-variance model with the DerSimonian-Laird (DL) estimate of τ^2.

we ponder that: first, to reduce the spread of the virus, governments worldwide recommended citizens seek hospital care only when strictly necessary (ie, approachability)[12]; second, the fear of infection[169 170] might have prevented patients from seeking and using care[33] (ie, ability to perceive and seek care) and third, the redirection of resources toward COVID-19 therapy resulted in de-prioritisation of routine care and elective interventions, lack of outpatient care and non-availability of treatment in hospital settings[170]; this shift also led to restrictions or denials of access to healthcare (ie, accessibility).[171] Reductions in access to and provision of services imply substantial diagnostic, treatment and care gaps, resulting in short-, mid- and long-term consequences for population health. These include increased morbidity and mortality, poorer clinical outcomes, delayed recovery and higher rates of medical relapse across various care specialties.[18 171] Our results are important because they provide an accurate quantification of the change in the use of services that may be of relevance to model its impact on population health outcomes. By stratifying the use of general health and MH services, our results emphasise the need for attention to MH services that, though severely affected during the pandemic, still lack priority on the policy agenda.[172] By focusing on a population with assessments of psychological distress or diagnosis of mental disorders, our review provides novel evidence for the direction of the association between MH and the use of health services. Unveiling this association is of particular importance because individuals with CMDs suffered disproportionately from the pandemic responses compared with the general population.[166] Discontinuation of MH services plausibly contributed to both the increase in the severity of CMDs and a greater impact of CMDs on socioeconomic and life circumstances, thus exacerbating pre-existing health inequalities in such a vulnerable population group.[166] An additional novelty of our review is that we retrieved studies from high and low- and middle-income countries, which confirmed that evidence is sparser in the latter than in the former setting.[18] This is the first research to patch the void related to the unclear association between MH and the use of health services during the pandemic by focusing on a population with assessments of psychological distress or diagnosis of mental disorders and differentiating services. The internal validity of our study is corroborated by the advanced statistical analyses and the standardisation of procedures, which limited information bias, increased reliability and assured quality of data extraction and formal assessment of quality of studies. The generalisability across various services, countries, population groups and community characteristics of our findings relies on the extensive search strategy in databases, proactive and systematic contact with authors and the screening and selection steps done in double. Nonetheless, several limitations should be acknowledged. The breadth of our review resulted in substantial heterogeneity in population data metrics and outcome measures across studies (eg, access measured at the patient level versus at the service level). Additionally, the size of catchment areas varied greatly across settings. Furthermore, the included studies were conducted during different pandemic waves and in various countries, which added complexity to the consistency of outcomes. Differences in virus spread, infection rates and PH restrictions across countries and regions further contributed to this variability. The heterogeneity of the collected data also precluded subgroup meta-analysis based on clinical characteristics of the population, such as pre-existing MH disorders or COVID-19 infection status. Another limitation of our review is that we restricted our search to five databases and applied language restrictions, which may have limited the comprehensiveness of our findings. Moreover, the generalisability of our results to patients without assessments of psychological distress or diagnosis of mental disorders is constrained by the specific focus we adopted. Due to the observational nature of our review, the interpretability of Egger's test is limited. Similarly, the interpretability of NOS score is limited because we adapted and standardised its use to align with the inclusion criteria of our meta-analysis, rather than the systematic review, and focused on how outcomes were measured in the primary studies. Finally, it should be noted that our search was completed in March 2023, and newer, potentially relevant studies may have since been published. To ensure the continued relevance of our findings, an update of this review and meta-analysis is planned for the end of 2025. The COVID-19 pandemic highlighted the necessity for PH responses to meet new population care needs while also addressing long-standing issues of scarce, unequal and inefficient healthcare resources.[173] The pandemic could provide a window of opportunity for promoting the reorganisation and reorientation of services towards needs-centred models. One example is the introduction of telemedicine, in the form of videoconferencing or phone, to permit follow-up of the patient. Telemedicine has set itself up as a practical and distinctive alternative to on-site care.[12 57] Previous studies have demonstrated its efficacy in managing chronic and MH care, suggesting the potential for long-lasting implementation. Still, the implications of its use on the quantity and quality of services supplied must be thoroughly explored.

CONCLUSION

While considering MH, COVID-19 has led to a decline in the use of health services, with minimal variation across age groups and service types. Significant

reductions in access to and provision of services led to unmet care needs, resulting in unpredictable consequences for population health outcomes.

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Contributors CS and EA conceptualised the study. MBB provided support with the conceptualisation of the study and the definition of the research questions. CS defined the search strategy. CS, BB and EP performed the study selection, data extraction and data curation. CB and MP conceptualised the methodology and supervised the study selection and data extraction process. FT, CB and MP performed the formal statistical analysis. FT did the visualisation of the meta-analysis outputs. CS, BB and EP assisted throughout the statistical analysis. CS wrote the original draft. MP and EA reviewed and edited the manuscript. All authors had full access to all the data in the study and had final responsibility for the decision to submit for publication. CS and EA directly accessed and verified the underlying data reported in the manuscript. CS is responsible for the overall content as guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, conduct, reporting, dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon reasonable request. Data collected for this study, including the full list of included and excluded records, raw extracted data and meta-analysed data will be made available on request by contacting the corresponding author. The review protocol, search string used to retrieve data, list of selected excluded studies, tables 1.1 and 1.2, and subgroup meta-analysis are available in the online supplemental material.

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