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Impact of COVID-19 pandemic on mental health of young people and adults: a systematic review protocol of observational studies

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ABSTRACT

Introduction Since the WHO declared COVID-19 as a pandemic, the spread of the new coronavirus has been the focus of attention of scientists, governments and populations. One of the main concerns is the impact of this pandemic on health outcomes, mainly on mental health. Even though there are a few empirical studies on COVID-19 and mental health, so far, there is no systematic review about the impact of COVID-19 on mental health of young people and adults yet. We aim to critically synthesise the scientific evidence about the impact of the COVID-19 pandemic on the mental health of young people and adults.

Methods and analysis A systematic review will be performed through eight databases: MEDLINE (Medical Literature Analysis and Retrieval System Online), ISI-of-Knowledge, CENTRAL (Cochrane Central Register of Controlled Trials), EMBASE (Excerpta Medica Database), SCOPUS, LILACS (Latin American and Caribbean Health Sciences Literature), PsycINFO (Psychology Information) and CNKI (Chinese National Knowledge Infrastructure), from inception until 30 June 2020. No restriction regarding the publication date, setting or languages will be considered. Preliminary search strategies were carried out on 29 March 2020 and will be updated in June 2020. The primary outcomes will be the prevalence and the severity of psychological symptoms in young people and adults (>18 years old) resulting from the impact of COVID-19 pandemic. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist. Pooled standardised mean differences and 95% CIs will be calculated. The risk of bias of the observational studies will be assessed through the Methodological Index for Non-Randomised Studies (MINORS). Additionally, if sufficient data are available, a meta-analysis will be conducted. Heterogeneity between the studies will be determined by the I^2 statistics. Subgroup analyses will also be performed. Publication bias will be checked with funnel plots and Egger's test. Heterogeneity will be explored by random-effects analysis.

Ethics and dissemination Ethical assessment was not required. Findings will be disseminated through peer-reviewed publication and will be presented at conferences related to this field.

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Strengths and limitations of this study

- This systematic review protocol reduces the possibility of duplication, gives transparency to the methods and processes that will be used, reduces possible biases and allows peer review.
- We will provide evidence in order to inform, support and customise shared decision-making from the healthcare providers, stakeholders and governments in this context of global outbreak of the coronavirus.
- This systematic review will be the first to evaluate critically the scientific evidence from the observational studies about the impact of the COVID-19 pandemic on the mental health of young people and adults.
- The heterogeneity of the studies as well as the methodological appraisal and the probably reduced number of studies (due to the recent COVID-19 outbreak) might be the main limitations of this systematic review.

INTRODUCTION

Emerging and re-emerging infectious diseases are constant challenges for global public health. Recent cases of pneumonia in Wuhan, China, have led to the discovery of a new type of zoonotic coronavirus—an enveloped RNA virus, commonly found in humans, other mammals and birds, capable of causing respiratory, enteric, liver and neurological disorders.[1]

Although COVID-19 has a low lethality of around 3%, its transmissibility is high,[1] with respiratory secretions being the main means of spreading SARS-CoV-2.[2] A study on

observations of SARS-CoV-2 infections in China, using a networked metapopulation dynamics and Bayesian inference models, in order to infer epidemiological characteristics associated with COVID-19, estimated that 86% of all infections were not documented (95% CI 82% to 90%) before travel restrictions. The findings of this research showed that the rate of transmission of undocumented infections per person was 55% of documented infections (46% to 62%). However, due to their greater number, undocumented infections were the source of infection for 79% of documented cases.[3] SARS-CoV-2 is already circulating in 213 countries and territories worldwide, with 6 094 239 infected and 368 818 deaths recorded on 30 May 2020, with the USA being the current epicentre with 1 805 689 confirmed cases and 105 043 deaths so far.[4]

Since the WHO declared COVID-19 a pandemic on 11 March 2020,[5] the new coronavirus spreading has been the focus of attention of scientists, government officials and populations.[6] One of the main concerns is the impact of this pandemic on health outcomes, especially on mental health.[7–9]

Overall, in the event of pandemics or natural disasters, people's physical health and the fight against the pathogen are the primary focus of attention of stakeholders/managers and health professionals, so the implications for mental health tend to be overlooked or underestimated.[10–12] However, measures taken to reduce the psychological implications of the pandemic cannot be minimised at this time,[13 14] mainly because the psychological implications can be more lasting and prevalent than the infection of COVID-19 itself, with repercussions in different sectors of society, resulting in important gaps in facing the negative issues associated with COVID-19.[10]

Studies have suggested that the fear of being infected by a potentially fatal virus, of rapid spread, whose origins, nature and course are still little known, ends up affecting the psychological well-being of many people.[15 16] Symptoms of depression, anxiety and stress in the face of the pandemic have been identified in the general population.[17] In addition, suicide cases potentially linked to the psychological implications of COVID-19 have also been reported in some countries, for example, South Korea[18] and India.[19]

In addition to the psychological implications directly related to COVID-19, measures to contain the pandemic may also consist of risk factors for mental health. In a review of the quarantine, researchers identified that the negative effects of this measure include symptoms of post-traumatic stress, confusion and anger.[13] Concerns about the scarcity of supplies and financial losses also cause damage to psychological well-being.[20] In this context, it also tends to increase social stigma and discriminatory behaviours against some specific groups that are more vulnerable.[10 21]

The rapid spread of the new coronavirus throughout the world, the uncertainties about how to control the disease and its severity, in addition to the unpredictability about the duration of the pandemic and its consequences, are characterised as risk factors for the mental health of the general population.[22] This scenario also seems to be aggravated by the spread of myths, fake news and misinformation about infection and preventive measures, as well as by the difficulty of the general population in understanding the guidelines of health authorities.[23]

Among the few population-based studies carried out to date about the implications of the COVID-19 pandemic on mental health, we highlight that the study held with the general population in China, including 1210 participants in 194 cities, stands out during the initial stage of pandemic.[17] This study revealed moderate to severe symptoms of anxiety, depression and stress in 28.8%, 16.5% and 8.1% of respondents, respectively. In addition, 75.2% of respondents reported fear of their family members becoming infected with the new coronavirus. Moreover, being a woman, student and having physical symptoms linked to COVID-19, or previous health problems, were factors significantly associated with higher levels of anxiety, depression and stress.[17]

The world's scientific community has been mobilising in record time to disseminate knowledge about COVID-19. On 13 February 2020, the vocabulary COVID-19 had already been added to the Medical Subject Heading (MeSH) terms as a subject heading index in Medical Literature Analysis and Retrieval System Online (MEDLINE) defined as 'A viral disorder characterized by high fever; cough; dyspnea; renal dysfunction and other symptoms of a viral pneumonia. A coronavirus SARS-CoV-2 in the genus betacoronavirus is the suspected agent'. Since the first scientific publications on COVID-19[1 6] so far, the MesH Term 'COVID-19' has been cited in 17 301 publications on PubMed. However, studies on the implications for the mental health of young people and adults as a result of the new coronavirus pandemic are still scarce, as it is a recent phenomenon, but which point to important negative repercussions. Hence, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) checklist as guideline,[24] we propose a systematic and a reproducible strategy to query the literature about the impact of the COVID-19 pandemic on the mental health of young people and adults.

RESEARCH AIMS

The purpose of this systematic review is to critically synthesise the scientific evidence about the impact of the COVID-19 pandemic on the mental health of young people and adults.

METHODS AND ANALYSIS

Search strategy

Search strategy will be performed in order to enhance methodological transparency and improve the reproducibility of the findings, following the PRISMA-P checklist.[24] Additionally, using the PICOS (Population/Intervention/

Comparison/Outcomes/Study Design) acronym,[25] we elaborated the guiding question of this review, to ensure the systematic search of scientific literature: 'What is the impact of the COVID-19 pandemic on mental health of young as well as adult people?' The PROSPERO—International Prospective Register of Systematic Reviews—registration number is CRD42020177366.

Studies will be retrieved from eight electronic bibliographic databases: MEDLINE via PubMed, ISI of Knowledge via Web of Science, Cochrane Central Register of Controlled Trials (CENTRAL), Excerpta Medica database (EMBASE), SCOPUS, Latin American and Caribbean Health Sciences Literature (LILACS), Psychology Information (PsycINFO) and Chinese National Knowledge Infrastructure (CNKI), from inception until 30 June 2020. No restriction regarding the publication date, setting or languages will be considered in this systematic review. In addition, secondary searches in other sources, such as Google Scholar and The British Library will be also carried out. The reference section of the included studies will be hand-searched for additional relevant studies. The search strategy will comprise only key terms according to a pre-established PICOS acronym. Two researchers (FJGSJ and LCL-J) will carry out the search strategy in all databases independently. Also, the bibliographic software EndNote (https://www.myendnoteweb.com/) will be used to store, organise and manage all the references and ensure a systematic and comprehensive search.

First of all, we will identify the existence of specific subject headings index in each database (such as MeSH terms, Emtree terms, PsycINFO Thesaurus and DeCS-Health Science Descriptors) and their synonyms (keywords). The search terms will be combined using the Boolean operators 'AND' and 'OR'.[26] Subsequently, the search strategy combining MeSH terms and keywords that will be used in MEDLINE (via PubMed) and adjusted to the other electronic databases as depicted in table 1. The preliminary search strategies were carried out on 29 March 2020 and will be updated in June 2020. Additionally, this systematic review is expected to be completed in August 2020.

Study selection

A summary of the Population (P), Interventions/Exposure (I), Comparators (C) and Outcomes (O) considered, following the PICO acronym, is shown in table 2.

Regarding the study design, we will include only observational studies that investigated the prevalence and the severity of psychological symptoms of young people and adults (>18 years old) resulting from the impact of the COVID-19 pandemic. Nevertheless, studies that analysed mental and behavioural disorders due to the use of alcohol and other drugs will be excluded. Studies carried out with children, adolescents, pregnant women and the elderly people will be excluded. Randomised controlled trial (RCT), non-randomised controlled trial (NRCT), qualitative studies and the grey literature will also be excluded. This systematic review has no restriction with regard to the languages as well as settings of the target population.

Screening and data extraction

First, the screening of studies will be held from the information contained in their titles and abstracts by two independent investigators (FJGSJ and LCL-J). When the reviewers disagree, the article will be evaluated and, if the disagreement persisted, a third reviewer (RAGL) will make a final decision. Second, the full-paper screening will be held by the same independent investigators. In order to measure intercoder agreement in each screening phase, Cohen's kappa will be used. Once consensus is reached on the selected studies, a standardised form based on previous studies[27–30] will be used for data extraction. Information to be extracted include four domains: (1) identification of the study (article title; journal title; impact factor; authors; country of the study; idiom; publication year; host institution of the study (community, hospital; university; research centre; single institution; multicentre study); conflict of interest and study sponsorship); (2) methodological characteristics (study design; study objective or research question or hypothesis; sample characteristics, eg, sample size, age, race, baseline characteristics; groups and controls; recruitment methods and study

Table 1 Concepts and search items

Databases	Search items
MEDLINE ISI of Knowledge CENTRAL EMBASE SCOPUS LILACS PsycINFO CNKI	#1 ((‘Young’ (All Fields) OR ‘Young Adult’ (MeSH Terms) OR ‘Adult’ (MeSH terms))) #2 ((‘Coronavirus’ (MeSH terms) OR ‘Coronavirus’ (all fields)) OR (‘COVID-19’ (all fields) OR ‘Severe Acute Respiratory Syndrome Coronavirus 2’ (supplementary concept) OR ‘Severe Acute Respiratory Syndrome Coronavirus 2’ (all fields) OR ‘2019-nCoV’ (all fields) OR ‘SARS-CoV-2’ (all fields)) OR ‘Pandemics’ (MeSH terms)) #3 ((‘Mental Health’ (MeSH terms) OR (‘Mental’ (all fields) AND ‘Health’ (all fields)) OR ‘Mental Health’ (all fields)) OR (‘Mental Disorders’ (MeSH terms) OR (‘Mental’ (all fields) AND ‘Disorders’ (all fields)) OR ‘Mental Disorders’ (all fields)) OR ‘Mental Illness’ (all fields) OR ‘Psychological Distress’ (MeSH terms) OR ‘Distress, Psychological’ (all fields) OR ‘Emotional Distress’ (all fields) OR ‘Distress, Emotional’ (all fields)) #4 #1 AND #2 AND #3

MEDLINE, Medical Literature Analysis and Retrieval System Online; CENTRAL, Cochrane Central Register of Controlled Trials; EMBASE, Excerpta Medica Database; LILACS, Latin American and Caribbean Health Sciences Literature; PsycINFO, Psychology Information; CNKI, Chinese National Knowledge Infrastructure.

Table 2 Inclusion and exclusion criteria

PICOS acronym[25]	Inclusion criteria	Exclusion criteria
P—Population	Young, young adult and adults of both sexes, age >18 years old and of any ethnicity	Children, adolescents, pregnant women and the elderly people of both sexes
I—Intervention/ exposure	COVID-19 outbreak	Other previous pandemics as well as studies that analysed mental and behavioural disorders due to the use of alcohol and other drugs
C—Comparison	Not applicable	–
O—Outcome	The primary outcomes is the prevalence and the severity of psychological symptoms	Studies that report prevalence and severity of symptoms of young people and adults who have had mental problems by other causes than due to the current COVID-19 pandemic
S—Study design	Observational studies	RCT, NRCT, qualitative studies and grey literature
Language	All languages	None
Setting	All settings	None

MeSH, Medical Subject Headings; NRCT, non-randomised controlled trials; RCT, randomised controlled trials.

completion rates; stated length of follow-up; validated measures; statistical analyses, adjustments); (3) main findings and implications for clinical practice; and (4) conclusions. The same two reviewers will perform the data extraction independently. Discrepancies between the reviewers will be resolved either by discussion or, in the lack of agreement, by a third reviewer (RAGL).

Methodological appraisal

The internal validity and risk of bias for non-randomised studies, the Methodological Index for Non-Randomised Studies (MINORS),[31] will be used. This instrument MINORS contains eight items for observational studies: (1) a clearly stated aim; (2) inclusion of consecutive patients; (3) prospective collection of data; (4) endpoints appropriate to the aim of the study; (5) unbiased assessment of the study endpoint; (6) follow-up period appropriate to the aim of the study; (7) loss to follow-up less than 5%; and (8) prospective calculation of the study size.[31] All items from the MINORS tool will be rated from 0 to 2, with score 0 indicating that the information was not reported, 1 indicating the information was inadequately reported and 2 indicating the information was adequately reported.[31] The same two reviewers (FJGSJ and LCLJ) will perform the critical appraisal independently. Disagreements will be resolved by a third reviewer (RAGL). The inter-rater reliability will be rated using intraclass correlation coefficients.[32] The authors from the original articles will be contacted if additional information is required.

Assessment of publication bias

For assessing the publication bias, a funnel plot will be examined. Following the approach proposed by Duval and Tweedie,[33] the number of studies that are missing from the funnel plot will be estimated, if any. The effect size after the imputation of these missing studies will be estimated by the trim-and-fill method.[33] Egger's test will also be performed.[34]

Data synthesis and meta-analysis

Quantitative data from each study will be extracted and inserted into an Excel sheet by two independent reviewers. Statistical analyses will be carried out using the Statistical Package for the Social Sciences (SPSS), V.18.0 (SPSS).

Standardised mean differences (SMDs) and 95% CI will be used to calculate the effect sizes, as we expect that most of the observational studies[35] included in our meta-analysis have reported differences in psychological symptoms. All effect sizes will be transformed into a common metric in order to make them comparable across studies—the bias-corrected standardised difference in means (Hedges' g). For continuous outcome measures, SMDs and risk ratio (RR) for categorical outcomes will be considered for the final assessment from individual studies. SMD was chosen as a measure of pooled results considering the likely variability in the measuring scales for continuous outcomes.[36] The effect size will be interpreted by Cohen's proposal: 0.20 corresponds to a small effect size, 0.50 corresponds to a medium effect size and 0.80 corresponds to a large effect size.[37]

A random-effects model will be selected under the assumption that studies included in the meta-analysis have been carried out with heterogeneous populations. Heterogeneity will also be tested by the I^2 statistic, which can quantify the heterogeneity ranging from 0% (no heterogeneity) to 100% (the differences between the effect sizes can completely be explained by chance alone), and the interpretations of the percentages are as follows: 0%–40% indicates potentially unimportant heterogeneity, 30%–60% indicates moderate heterogeneity, 50%–90% indicates substantial heterogeneity and 75%–100% indicates considerable heterogeneity.[35]

To explore the heterogeneity across studies, subgroup analysis will be performed using a mixed effects model according to the following variables: age (young people vs adults), ethnicity (impact on mental health of patients from a specific ethnic group vs not) and psychological distress (mild vs moderate vs severe).

Quality of evidence

In order to determine whether the estimated effect size is reliable, the Grading of Recommendations Assessment, Development and Evaluation[38] system will be used. This system helps to evaluate the quality of evidence in the domains of risk of bias, consistency, directness, precision and publication bias through four categories: high, moderate, low and very low.

Patient and public involvement

Since this is a systematic review protocol, no patients as well as public are involved.

Ethics and dissemination

Due to the characteristics of this study design, the ethical evaluation was not required. The findings of this systematic review will be disseminated through peer-reviewed publication and will be presented at international conferences related to this field. Furthermore, any amendments to this protocol will be documented with reference to the saved searches and analysis methods, which will be recorded in bibliographic databases, for data collection and synthesis.

DISCUSSION

One of the strengths of the proposed systematic review is to apply a reproducible and transparent procedure for systematic review of the literature. In this protocol, we clearly describe the types of studies, participants, intervention/exposure and outcomes that will be considered according to the research question, as well as the data sources, search strategy, data extraction methods (including critical appraisal of the studies included) and data synthesis.[39] By publishing the research protocol, we reinforce the clarity of the strategy and minimise the risk of bias, namely, selective outcome reporting.[39] Also, we will focus only on the impact of the current COVID-19 pandemic on the mental health of young people and adults. These results shall provide evidence in order to inform, support and customise shared decision-making from the healthcare providers, stakeholders and governments.

Potential limitations of this systematic review might include the heterogeneity of the studies as well as methodological appraisal and the probably reduced number of studies in subgroup analyses (due the recent COVID-19 outbreak), which may influence the external validity.

COVID-19 is challenging our position in the world because we realise our connectedness to those around us regardless of geographical distance, yet at the same time, we become deeply aware of our individuality because the illness will be a threat to our physical and mental well-being. COVID-19, then, is as much as challenge for how we are to frame it from a psychiatric perspective as it is symptomatic of a public health crisis. Our responsibility as healthcare providers, including both clinicians and academics, is to ensure that our normativity about the ways we prescribe or caring the meaning and representation of COVID-19 to our own selves and the world, enhances our mental health rather than leads to a deterioration of what we can transform individually and globally from this juncture onward.[40]

In this sense, the present systematic review will deliver relevant evidence about the impact of the COVID-19 pandemic on the mental health of young and adult people in order to address the gap in the literature as well as guide important strategies and health policy decision-making to the society.

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Contributors FJGSJ and LCL-J conceptualised and designed the protocol, drafted the initial manuscript and reviewed the manuscript. FJGSJ, JCeSS, CFdSM and LCL-J defined the concepts and search items, data extraction process and methodological appraisal of the studies. APCC, LRBC, PIGM, TAdSM, RAGL and LCL-J planned the data extraction and statistical analysis. FJGSSJ, RAGL and LCL-J provided critical insights. All authors have approved and contributed to the final written manuscript.

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