



Scientific evidence on mental health in key regions under the COVID-19 pandemic – meta-analytical evidence from Africa, Asia, China, Eastern Europe, Latin America, South Asia, Southeast Asia, and Spain

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ABSTRACT

This systematic review aims to summarize the prevalence of anxiety, depression, and insomnia in the general adult population and healthcare workers (HCWs) in several key regions worldwide during the first year of the COVID pandemic. Several literature databases were systemically searched for meta-analyses published by 22 September 2021 on the prevalence rates of mental health symptoms worldwide. The prevalence rates of mental health symptoms were summarized based on 388 empirical studies with a total of 1,067,021 participants from six regions and four countries. Comparatively, Africa and South Asia had the worse overall mental health symptoms, followed by Latin America. The research effort on mental health during COVID-19 has been highly skewed in terms of the scope of countries and mental health outcomes. The mental health symptoms are highly prevalent yet differ across regions, and such evidence helps to enable prioritization of mental health assistance efforts to allocate attention and resources based on the regional differences in mental health.

Evidencia científica sobre la salud mental en regiones clave en el contexto de la pandemia por la COVID-19 – Evidencia metaanalítica de África, Asia, China, Europa del este, Latinoamérica, Asia meridional, el Sudeste Asiático y España

El objetivo de esa revisión sistemática es el de resumir la prevalencia de la ansiedad, la depresión y el insomnio, tanto en la población general adulta como en los trabajadores de salud de diferentes regiones clave alrededor del mundo durante el primer año de la pandemia por la COVID-19. Se revisaron de manera sistemática diversas bases de datos científicas buscando metaanálisis sobre la prevalencia de síntomas en salud mental alrededor del mundo, publicados hasta el 22 de setiembre del 2021. Se resumió la prevalencia de los síntomas de salud mental sobre la base de 388 estudios empíricos, comprendiendo a 1.067.021 participantes de cuatro países y de seis regiones. África y Asia meridional tuvieron, de manera general, los peores síntomas de salud mental, seguidas por Latinoamérica. El esfuerzo por realizar investigación en salud mental durante la pandemia por la COVID-19 ha estado altamente sesgado en torno a la envergadura de los países y de las medidas de resultado empleadas en salud mental. Los síntomas de salud mental son altamente prevalentes; no obstante, difieren a lo largo de diferentes regiones. Esta evidencia ayuda a permitir la priorización de los esfuerzos de atención en salud mental asignando la atención y recursos basados sobre las diferencias regionales en salud mental.

疫情下关键地区心理健康的科学证据——来自非洲、亚洲、中国、东欧、拉丁美洲、南亚、东南亚和西班牙的元分析证据

本系统综述旨在总结 COVID 疫情第一年期间全球几个关键地区的一般成年人和医护人员 (HCW) 中焦虑、抑郁和失眠的流行情况。系统检索了几个文献数据库,以获取 2021 年 9 月 22 日之前发表的关于全球心理健康症状流行率的元分析。基于总共来自六个地区和四个国家的 1,067,021 名参与者的 388 项实证研究总结了心理健康症状的流行率。相比之下,非洲和南亚的整体心理健康症状更差,其次是拉丁美洲。就国家范围和心理健康结果而言,对 COVID-19 期间心理健康的研究工作存在高度偏差。心理健康症状非常普遍,但因地区而异,此类证据有助于确定心理健康援助工作的优先级,以根据心理健康的区域差异分配关注度和资源。

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关键词

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HIGHLIGHTS

- The prevalence rates of mental health symptoms were summarized from 388 studies of 1,067,021 individuals in Africa, Asia, Eastern Europe, and Latin America.
- Mental health symptoms under COVID-19 pandemic were worst in Africa and South Asia followed by Latin America.

1. Introduction

The mental health situation of the COVID-19 pandemic across geographic regions has become an important topic to study (Olf et al., 2021). The scientific evidence on mental health under the COVID pandemic is important because assessing the prevalence and severity of mental health under the unprecedented crisis enables and directs the effort and planning of mental health responses under scarce resources. The meta-analytical evidence on the topic is especially critical to enable evidence-based medicine and healthcare. A tremendous effort of Olf et al. (2021) assessed the mental health symptoms under COVID-19 with 7034 respondents (74% female) from 88 countries across geographical regions and found Latin America in particular experienced high mental health symptoms (Olf et al., 2021). To complement this important primary study, this correspondence reports and compares the mental health symptoms on the key populations based on meta-analytical evidence of existing studies in the key geographical regions to provide further evidence on this critical topic.

2. Methods and materials

To compare the prevalence of mental health symptoms during COVID-19 among different regions and countries, we searched *PubMed*, *Embase*, *PsycINFO*, *Web of Science*, *medRxiv*, and *Google Scholar* in English for meta-analyses on mental health symptoms of the key adult population and healthcare workers (HCWs) during COVID-19 from 1 February 2020 to 31 July 2021, updated by 22 September 2021. For example, the following Boolean operators on three sets of keywords were used in *Web of Science*: (ALL = ((2019-nCoV OR 2019nCoV OR COVID-19 OR SARS-CoV-2 OR (Wuhan AND coronavirus)) AND ('depressi*' OR "anxi*" OR "insomnia" OR "sleep" OR 'distress' OR 'mental health' OR 'psychiatric' OR 'psychopatholog*'))) AND (TS = 'meta-analysis'). The search targeted and included meta-analyses that focused on the prevalence of anxiety, depression, distress, and insomnia in *specific* regions or countries during COVID-19. Meta-analyses that did not specify regions or countries are excluded. When multiple meta-analyses exist on the same region, the most comprehensive analysis is chosen.

3. Results

The search generated 10 meta-analyses on mental health symptoms during COVID-19 from the six regions (Africa, Eastern Europe, Latin America South, and Asia and Southeast Asia nested within Asia) and four countries (China, Egypt, India, and Spain), as summarized in Table 1 (Chen et al., 2021; Chen, et al., In Press; Chen et al., 2021; El-Qushayri et al., 2021; Hossain et al., 2021;

Norhayati MY & Azman, 2021; Pappa, et al., in press; Singh, Bajpai, & Kaswan, 2021; Zhang et al., 2021; Zhang et al., 2021). Table 1 tabulates these meta-analytical studies for easy comparisons. The 10 meta-analyses summarized the findings of 388 empirical studies with a total of 1,067,021 participants in 51 countries.

These meta-analyses show that the research effort on mental health during COVID-19 has been highly skewed in terms of the scope of countries and mental health outcomes. The studies are far from evenly distributed across countries: there have been 131 studies on China, 28 on Spain, and 22 on India, yet only 51 out of the 157 countries in the four continents have been studied, leaving 106 countries that have yet to receive a single study. Specially there have been no studies in 42 out of 54 countries in Africa, 30 out of 48 countries in Asia, 23 out of 33 countries in Latin America, and 11 out of 21 countries in Eastern Europe. While all nine meta-analyses include on anxiety and depression, only six of them cover insomnia and three investigate distress.

The meta-analyses generally found mental health symptoms to be highly prevalent yet differ across regions. Comparatively, Africa and South Asia had the worse overall mental health symptoms, followed by Latin America. All adult population categories inclusive, Africa had the highest prevalence rate of depression (45%), followed by South Asia (34%) and Latin America (32%). South Asia was highest in anxiety (41%), followed by Africa (37%) and Latin America (32%). Latin America had the highest insomnia (35%), followed by Africa (28%). Consistently, the general population in Africa and South Asia had the highest prevalence rates of anxiety and depression, followed by Latin America. The findings of meta-analyses on Egypt and India also corroborated the high prevalence rates in Africa and South Asia, respectively.

With some exceptions, the prevalence rates of anxiety and depression of frontline HCWs in all regions and countries examined are higher than those reported in meta-analyses from general HCWs and general populations. For example, Frontline HCWs had the highest prevalence rate of depression (55%) and anxiety (51%) in Africa, followed by Eastern Europe (34% on depression and 56% on anxiety) and Spain (33% on depression and 46% on anxiety). Among general HCWs in the five regions, those in Africa had the highest prevalence in depression (43%) and those in South Asia had the highest prevalence in anxiety (44%).

4. Discussions

First, our findings revealed there have been many studies on mental health during COVID-19, but the research effort to date has been highly skewed in geographical regions. There have been no empirical studies in 89 out of the 119 countries in the regions studied, particularly in Africa and Latin America,

Table 1. Existing meta-analytical evidence on the prevalence rates of key mental health symptoms in several regions.

| Region/country | # of studies | # of countries | # of participant | All adult pop. inclusive | | | | General population | | | | General HCWs | | | | Frontline HCWs | | | |
|--|--------------|----------------|------------------|--------------------------|-----|-----|-----|--------------------|-----|-----|-----|--------------|-----|-----|-----|----------------|-----|-----|-----|
| | | | | ANX | DEP | INS | DIS | ANX | DEP | INS | DIS | ANX | DEP | INS | DIS | ANX | DEP | INS | DIS |
| Africa (Chen et al., In Press) | 28 | 12/54 | 15,072 | 37% | 45% | 28% | | 37% | 42% | 27% | | 35% | 43% | 28% | | 51% | 55% | 30% | |
| -Egypt (El-Qushayri et al., 2021)* | 10 | 1/1 | 3,137 | | | | | | | | | 72% | 66% | 58% | | | | 67% | |
| Asia (Norhayati MY & Azman, 2021) | 80 | 18/48 | 149,925 | | | | | | | | | 35% | 35% | 41% | | 24% | 33% | 49% | 41% |
| -South Asia(Hossain et al., 2021)** | 35 | 5/8 | 41,402 | 41% | 34% | | | 41% | 39% | | | 44% | 30% | | | | | | |
| -Southeast Asia (Pappa et al., in press) | 32 | 6/11 | 20,352 | 22% | 16% | 19% | | 31% | 16% | | | 18% | 15% | | | 32% | 14% | | |
| -China (Chen et al., 2021)*** | 131 | 1/1 | 630,244 | 11% | 13% | 19% | 20% | 15% | 16% | 20% | 25% | 14% | 15% | 18% | 29% | 19% | 20% | 24% | 29% |
| -India (Singh et al., 2021) | 22 | 1/1 | 9,947 | 34% | 33% | 27% | 43% | | | | | | | | | | | | |
| Eastern Europe (Zhang et al., 2021) | 21 | 10/21 | 21,918 | 30% | 27% | | | 22% | 20% | | | 33% | 34% | | | 46% | 34% | | |
| Latin America (Zhang et al., 2021) | 33 | 10/33 | 101,772 | 32% | 32% | 35% | 32% | 33% | 33% | 33% | 33% | 30% | 31% | 30% | 30% | 23% | 37% | | |
| Spain (Chen et al., 2021) | 28 | 1/1 | 86,336 | 20% | 22% | | | 17% | 20% | | | | | | | 46% | 33% | | |

ANX = Anxiety, DEP = Depression, INS = Insomnia, DIS = Distress.

of countries refer to the number of countries that a meta-analysis covered out of the total number of countries in the region.

*Meta-analysis in Egypt studies reported the prevalence rates at the mild above level. Their prevalence rates of anxiety, depression, and distress at the moderate above are 61.9%, 53.0% and 52.3%, respectively.

**The HCWs in the South Asia studies and Egypt studies aggregated both general HCWs and frontline HCWs.

***The meta-analysis in China reported the prevalence rates at the moderate symptom for the three subgroup populations; Meta-analyses in other regions reported the prevalence rates of the overall symptom.

showing the importance of the primary study of Olf et al. (2021) in 88 countries (Olf et al., 2021). In countries without any direct evidence, healthcare organizations might use the meta-analytic evidence in the same regions or nearby countries as a proxy.

Second, our meta-analytical evidence helps identify which regions are hit the worst in terms of mental health. To date, media and scientific literature have called out various regions as mentally vulnerable during the pandemic, yet such statements are often not backed up by evidence, and our meta-analytical evidence indicated the mental health situations are the worst in Africa and South Asia, followed by Latin America.

Third, our summary and comparison have direct policy implications to enable prioritization of mental health assistance efforts to allocate their attention and resources based on the regional differences in mental health. Healthcare organizations, such as WHO, can use such evidence to allocate resources for mental health assistance across regions and populations (such as healthcare workers), under the resource constraint situation in the prolonged pandemic.

Nonetheless, such evidence provides only a high-level approximate of the reality and is bound to evolve; nonetheless, it provides an initial step towards evidence-based medicine to enable more targeted mental health interventions across regions under resource constraints (Jahanshahi et al., 2020; Lateef et al., 2021).

Credit author statement

SXZ: Conceptualization, writing – original draft, writing – review & editing. JC: Methodology, investigation, writing – original draft, writing – review & editing.

All authors reviewed and approved the manuscript. The corresponding author attests that all authors listed meet authorship criteria and that no others meeting the criteria have been omitted.

Data and materials availability

All data are secondary and available per request.

Disclosure statement

All authors have completed the Unified Competing Interest form and declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years, no other relationships or activities that could appear to have influenced the submitted work.

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Patient and public involvement

No patient or public was involved in a systematic review and meta-analysis.

Transparency declaration

The corresponding author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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