The Impact of Inequality on Mental Health Outcomes During the COVID-19 Pandemic: A Systematic Review

Abstract

Previous research on pandemics and emergencies has shown that such events often widen health inequalities in society and have a greater impact on socially disadvantaged groups. No review has so far looked at the impact of inequality factors on mental health outcomes during the novel coronavirus outbreak (COVID-19). The aim of the current review was therefore to assess the impact of inequality factors on mental health outcomes during COVID-19. After registration on PROSPERO, a systematic review was conducted for papers published up to 31 July 2020 using the databases Google Scholar, PsycINFO, PubMed (MEDLINE), and Web of Science. The following inequality factors were considered: education, income, employment, occupation, material and social deprivation, age, immigrant status, sexual orientation, functional health, cultural/racial background, sex, gender, and place of residence. Out of 1,931 references, 117 studies (300,061 participants) were included. Female sex, being of a younger age, financial insecurity, lack of access to clear messaging/information about the pandemic, proximity to large infection sites, having existing physical and/or psychological health conditions, and being subjected to abuse/stigma because of one's identity as a member of an ethnic or sexual marginalised group predicted mental health inequalities. More research is required on how inequality affects mental health in less studied vulnerable populations, such as ethnic, sexual, and gender marginalised participants, as well as how inequality factors interact to affect mental health in the long term. Recommendations for researchers, mental health practitioners, and public health authorities for mitigating adverse mental health outcomes in vulnerable populations are outlined.

Keywords: COVID-19; Inequality; Inequity; Mental health; Pandemic

Public Significance Statement

The findings of this review suggest that several inequality factors, such as female sex, younger age, financial insecurity, having existing chronic health conditions, and being in an ethnic or sexual marginalised group predict worse mental health outcomes during the ongoing COVID-19 pandemic. There is an urgent need for mental health services to support vulnerable populations at this time, to reduce mental health inequalities and improve long-term psychological functioning.

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Introduction

"Social distancing is a privilege. It means you live in a house large enough to practice it. Hand washing is a privilege too. It means you have access to running water. Hand sanitisers are a privilege. It means you have money to buy them. Lockdowns are a privilege. It means you can afford to be at home. Most of the ways to ward the Corona off are accessible only to the affluent. In essence, a disease that was spread by the rich as they flew around the globe will now kill millions of the poor" (Anonymous Indian doctor, cited by Tomazin, 2020).

The novel coronavirus (COVID-19) outbreak is caused by infection with severe acute respiratory syndrome coronavirus-2 (SARs-CoV-2). It was declared by the World Health Organisation (WHO) as a Public Health Emergency of International Concern (PHEIC) on 31 January 2020 and as a pandemic on 11 March 2020. Apart from the physical health problems that are caused by the virus (e.g., respiratory symptoms, fever, cough, shortness of breath, and breathing difficulties), the recent outbreak is likely to have far-reaching mental health consequences (Marazziti et al., 2020; Rajkumar, 2020; Torales et al., 2020; Vinkers at al., 2020), particularly as the focus on COVID-19 may have diverted resources from the treatment of other pre-existing mental and physical health conditions (Mauro et al., 2020; van der Miesen et al., 2020). Additionally, COVID-19 is likely to have distinct impacts across different population groups (Kirby, 2020; Wright et al., 2020). Previous research on pandemics and emergencies (e.g., natural disasters) has shown that such events often widen health inequalities in society, and have a greater impact on socially disadvantaged groups (e.g., racialised or minoritized individuals, people with low income, migrant workers, etc.) compared to their socially advantaged counterparts (Ahmed, Ahmed, Pissarides, & Stiglitzet, 2020; Purtle, 2012). Several factors of inequality have been identified by the Public Health Agency of Canada

(2018) and include a person's socioeconomic status (e.g., education, income, employment, occupation, and material and social deprivation), population group (e.g., age, immigrant status, sexual orientation, functional health, and cultural/racial background), sex and gender, and place of residence (i.e., urban versus rural). Such factors have a big impact on underlying health inequalities in society, which may be further exacerbated by the current COVID-19 outbreak (Jetten et al., 2020; van Dorn et al., 2020). In addition, these health inequalities can also manifest in greater mental health disparities between the different populations.

People are generally more likely to be healthy and less likely to have underlying health conditions if they are more affluent, White, and living in a Western country (Haslam et al., 2018; Marmot, 2015). In the context of COVID-19, those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness after contracting the virus (WHO, 2020a). As such pre-existing health conditions are more prevalent in disadvantaged groups, this puts them at higher risk of COVID-19-associated mortality (Ahmed, Ahmed, Pissarides, & Stiglitzet, 2020; Johnson-Mann et al., 2020). However, less is currently known about how inequality factors affect the *psychological* health of disadvantaged populations. It is plausible that being at higher risk for COVID-19-related complications and mortality would cause individuals to be more anxious, worried, and fearful about the ongoing outbreak. Similarly, being in unstable employment, living in poorer areas, and having a lower household income, which are situations more common among marginalised populations (Bowleg, 2020), are likely to exacerbate feelings of stress, depression, and anxiety during what is already a challenging time for many (Devitt, 2020; Lund, 2020). Moreover, because the spread of COVID-19 is now known to have originated in central China (Centers for Disease Control & Prevention, 2020), several researchers have highlighted the increase in stigmatisation and prejudice towards individuals of Chinese, or, by association, wider Asian origin (Wen et al., 2020).

Something that has hitherto widely been lacking in the existing mental health literature surrounding COVID-19 and similar emergencies is the assessment of the intersectionality between inequality factors. Indeed, inequality factors often interact and thereby produce a greater impact on mental health outcomes for affected individuals than any one inequality factor alone (Gabrielli & Lund, 2020; Lapalme et al., 2019). For instance, people with mental illnesses are not only directly predisposed to poorer mental health outcomes, but often also have higher rates of chronic medical conditions and a shortened lifespan, and may struggle with poverty, housing, access to education and employment, and social connection (Kaufman et al., 2020; Yao et al., 2020). Similarly, racialised or minoritized individuals in some countries are more likely to be in unstable employment and have a lower income, which can be a further cause of stress and psychiatric morbidity (Kapilashrami & Bhui, 2020; Purtle, 2020). Moreover, when investigating sex and gender, it is important to consider how sex interferes with gender to influence vulnerability. Gender is defined as the social and cultural norms, roles, attributes, and behaviours that a society considers appropriate for men and women or boys and girls (WHO, 2020b). Current evidence suggests that the ongoing COVID-19 outbreak relates to sex and gender both directly (e.g., through differences in incidence and case fatality) and indirectly (e.g., through social and economic consequences, such as domestic violence, job insecurity, and increased workload) (Gebhard et al., 2020; Wenham et al., 2020). Consequently, a pandemic such as COVID-19 is likely to have disparate effects on the mental health of disadvantaged populations. As inequalities frequently interact and may worsen these effects, research is urgently required that considers the effects of several inequality factors on mental health outcomes during the ongoing outbreak and beyond.

Several reviews have so far been conducted to assess the effects of the ongoing COVID-19 pandemic and similar outbreaks on mental health outcomes among the general population (Kontoangelos et al., 2020; Rajkumar, 2020), healthcare workers (HCWs) (Kisely et al., 2020;

Pappa et al., 2020; Schneider et al., 2020; Spoorthy, 2020), and children and adolescents (Fegert et al., 2020). Many of these reviews are limited by small study samples (particularly for COVID-19) and primarily healthy participants from only a few affected countries. As COVID-19 is a global emergency, and has to date (as of 13 October 2020) affected 214 countries and territories, more comprehensive reviews are required that take into account different countries and their varying populations, to fully understand the mental health consequences of the virus globally and inclusively (Pierce et al., 2020). This is especially important given that vulnerable individuals are at particular risk for long-term mental health consequences as a result of the ongoing pandemic (Kelly, 2020). To our knowledge, no systematic reviews have so far been conducted to investigate the impact of the COVID-19 pandemic on the mental health of vulnerable populations and included several inequality factors to draw comparisons between findings. Therefore, the aim of the current review was to explore inequality factors that impact the mental health of various population groups during the ongoing COVID-19 outbreak, and to identify protective and risk factors that can be targeted in future interventions to reduce the impact of COVID-19 on short-term and long-term psychological well-being in vulnerable populations.

Methods

This review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (PRISMA; Moher et al., 2010) and pre-registered on PROSPERO (ref no. CRD42020200216).

Data Sources and Search Strategies

A systematic search was conducted for papers published up to 31 July 2020 using the databases Google Scholar, PsycINFO, PubMed (MEDLINE), and Web of Science. Boolean combinations of the following search terms and their abbreviations were used: COVID-19; coronavirus; SARS-CoV-2; psychological; stress; distress; anxiety; depression; mental health;

psychiatric issues; dysfunction; low mood; sad; inequality; inequity; deprivation; age; gender; sex; transgender; vulnerable; disability; handicap; ethnicity; race; sexual orientation; income; unemployed; housing; education; access; rural; urban; functional health; migrant; Indigenous; First Nations; homeless; Inuit; Métis. Reference sections of included articles were scanned to identify additional studies that met inclusion criteria.

Inclusion and Exclusion Criteria

Papers were included if they: (1) described the effect of the COVID-19 outbreak on any mental health outcome; (2) were written in English, French, Spanish, or Italian (as these include the official languages of Canada as well as the spoken languages of the authors); and (3) analysed differences in mental health based on any inequality factor or relationships between any inequality factor and mental health outcomes. We included the following inequality factors as outlined by the Public Health Agency of Canada (2018): socioeconomic status (e.g., education, income, employment, occupation, and material and social deprivation); population group (e.g., age, immigrant status, sexual orientation, functional health, and cultural/racial background); sex and gender; and place of residence (i.e., urban versus rural). Studies were excluded if they did not provide quantitative data related to inequality and/or mental health.

Data Extraction

The first three authors independently extracted data from the identified studies. The following data were extracted: (I) author(s), (II) country, (III) sample size and participant sex (percentage female), (IV) age in years, (V) measures used, (VI) inequality factors affecting mental health outcomes, and (VII) study quality. For studies that described statistically significant outcomes, a p value $<.05$ was considered significant.

Quality Assessment

Quality was assessed using the Effective Public Health Practice Project (EPHPP) tool, which provides good interrater agreement for overall quality (Armijo-Olivo et al., 2010) across

a variety of quantitative study designs (Thomas et al., 2004). Studies were assessed on: (I) selection bias, (II) study design, (III) confounders, (IV) blinding, (V) data collection methods, and (VI) withdrawals and dropouts. Components were scored as 1 ('strong'), 2 ('moderate'), or 3 ('weak'). EPHPP guidelines were used to generate a global score as follows: no 'weak' component ratings = 'strong', one 'weak' component rating = 'moderate', and two or more 'weak' component ratings = 'weak'. The first two authors independently assessed all studies. Cohen's kappa (Cohen, 1960) was calculated to determine inter-rater reliability, showing moderate agreement (90.6%) between scores (κ=.718, p<.001). Discrepancies were due to differences in interpretation of criteria and were discussed with the third author until a 100% agreement in coding was reached.

Results

Paper Selection

As of 31 July 2020, the search protocol yielded 1,931 papers (see Fig. 1). After removing duplicates, 1,893 papers were reviewed based on the title. Of those, 836 abstracts were retained for review and 184 articles were reviewed based on the full text. Fifty-five articles were excluded because they were not empirical studies (i.e., they were commentaries, letters to the editor, etc. and this was unclear in the abstract) and 12 studies were excluded because they did not analyse the effect of inequality factors on mental health outcomes. All full-text articles were independently screened by the first three authors.

[Fig. 1 around here]

Study Characteristics

A final sample of 117 studies (300,061 participants) was included in this review (see Table 1), consisting of 112 cross-sectional studies, four cohort studies, and one case-control study. The majority of the included studies were rated as 'moderate' (n=93) or 'weak' (n=21), and three studies were rated 'strong'. The studies were conducted in 28 different countries,

with the majority of the research being conducted in China (*n*=47) or the United States (*n*=14). Additionally, two studies were conducted using samples from 63 and 103 different countries. Most of the included studies (*n*=62) investigated the mental health impact of COVID-19 on the general population, twenty-five investigated HCWs, ten investigated patients with COVID-19 or other health conditions, seven investigated high school or college/university students, six investigated pregnant or postpartum women, four investigated young adults, two investigated teachers or academic staff, one investigated older adults, and one investigated children and adolescents. The most commonly assessed mental health outcomes were anxiety, depression, and stress (see Fig. 2 for a summary of mental health outcomes). In terms of inequality, most studies assessed sex (*n*=97), age (*n*=58), chronic disease history (*n*=32), or education level (*n*=28), with significantly less studies comparing mental health outcomes based on place of residence (*n*=17), occupation (*n*=14), income (*n*=14), (un)employment status (*n*=14), ethnicity (*n*=10), gender (*n*=2), sexual orientation (*n*=2), or migrant status (*n*=1). The majority of studies examined more than one inequality factor.

[Table 1 around here]

[Fig. 2 around here]

Sex

The majority of studies that investigated differences between sexes in relation to mental health during the COVID-19 pandemic found that women were more likely to report adverse mental health outcomes than men across all populations (e.g., Iob et al., 2020; Liu, Zhang, Wei et al., 2020; Mazza et al., 2020; Zhou et al., 2020). Seven studies also found poor mental health in pregnant women (Berthelot et al., 2020; Durankus & Aksu, 2020; Farewell et al., 2020; Liu, Chen et al., 2020; Mappa et al., 2020; Taubman–Ben-ari et al., 2020; Wu et al., 2020) and worse outcomes post-outbreak than in the pre-pandemic cohort (Berthelot et al., 2020; Wu et al., 2020). Only seven studies found worse outcomes in men (Ahmed, Ahmed, Aibao, et al.,

2020; Gao, Sun et al., 2020; Karatzias et al., 2020; Liang, Gao et al., 2020; Ozamiz-Etxebarria et al., 2020; Song et al., 2020; Verma & Mishra, 2020) and 16 studies found no differences in mental health based on sex (e.g., Cao et al., 2020; Kokou-Kpolou et al., 2020; Pedrozo-Pupo et al., 2020; Rodriguez et al., 2020).

Age

In terms of age, the majority of studies found that younger age (<35 years) was associated with detrimental mental health outcomes (e.g., Badahdah et al., 2020; Berthelot et al., 2020; Kavčič et al., 2020; Maarefvand et al., 2020), with two studies showing worse outcomes in middle age (Balkhi et al., 2020; Song et al., 2020), three studies showing worse outcomes in older participants (>50 years) (Bergman et al., 2020; Cortes-Alvarez et al., 2020; Gao, Sun et al., 2020), and eight studies showing no differences in mental health based on age (e.g., Cotrin et al., 2020; Huang et al., 2020; Mappa et al., 2020; Umucu & Lee, 2020). Notably, three studies showed worse mental health outcomes in both younger and older individuals, compared to participants of middle age (Morgul et al., 2020; Qiu et al., 2020; Tian et al., 2020). Among children and adolescents, older participants reported worse mental health (Duan et al., 2020; Zhou et al., 2020).

Education

Most studies found that a lower level of education predicted worse mental health across different populations (e.g., Doshi et al., 2020; El-Zoghby et al., 2020; Gao, Sun et al., 2020). However, five studies found that higher education level predicted worse outcomes (Balkhi et al., 2020; Fu et al., 2020; Mappa et al., 2020; Qiu et al., 2020; Wang, Di et al., 2020) and four studies found no differences in mental health based on education level (Liu, Yang et al., 2020; Liu, Zhang, Wei et al., 2020; Moccia et al., 2020; Pedrozo-Pupo et al., 2020). Notably, one study compared the effects of education in Jewish and Arab participants and found that higher education level positively predicted anxiety among Jewish participants, but negatively

predicted anxiety among Arab participants (an ethnically racialised and minoritized group) (Kimhi et al., 2020).

Income, Employment, and Occupation

In general, more adverse mental health outcomes were reported by participants with lower average household income (e.g., Horesh et al., 2020; Lei et al., 2020; Naser et al., 2020; Ping et al., 2020), while stability of (family) income predicted better mental health (Cao et al., 2020). Contrary to expectations, however, two studies found that higher income predicted anxiety (Fu et al., 2020; Naser et al., 2020) and one study found that being in the middle-income category and having adequate living space put pregnant women at higher risk for depressive and anxiety symptoms (Wu et al., 2020). In terms of employment, participants who were unemployed (Fitzpatrick et al., 2020b; Iob et al., 2020; Li & Wang, 2020; Mazza et al., 2020; Solomou & Constantinidou, 2020) or lost employment during the outbreak (Rodríguez-Rey et al., 2020b; Santos et al., 2020; Zhang, Wang, Rauch, & Wei, 2020) reported worse mental health. However, two studies also found that being employed contributed to worse mental health outcomes (Verma & Mishra, 2020) and having longer daily work hours or increased workload were risk factors for depression, PTSD, and psychological distress in HCWs (Shacham et al., 2020; Song et al., 2020; Zhu, Xu et al., 2020). As such, findings are not uniform regarding employment and may depend on individuals' life situation (e.g., changes in employment or workload as a result of the outbreak) and occupation (e.g., being a high-risk worker). For instance, Naser et al. (2020) found that being retired was negatively associated with anxiety. Additionally, Mazza et al. (2020) found that having to go out to work during the COVID-19 outbreak was associated with stress and Wu et al. (2020) found that being employed full-time put pregnant women at higher risk for depressive and anxiety symptoms. Another study found that participants on furlough reported higher distress compared to those who were unemployed and those who worked full-time (Mimoun et al., 2020). It is therefore plausible

that other associated variables, such as financial security and average household income, as well as availability of childcare and support, may be more predictive of mental health outcomes than employment status alone. Indeed, one study found that financial concern mediated the relationship between job insecurity and anxiety (Wilson et al., 2020). Additionally, two studies found that poor mental health outcomes were related to concern about profession and ability to meet living expenses (Khanna et al., 2020; Thomaier et al., 2020) and three studies found that participants with worse socioeconomic status were more likely to report adverse mental health outcomes (Iob et al., 2020; Lei et al., 2020; Park et al., 2020).

In terms of occupation, HCWs generally reported most mental health symptoms (Civantos et al., 2020; Doshi et al., 2020; Huang & Zhao, 2020; Jahrami et al., 2020; Naser et al., 2020; Seyahi et al., 2020; Zhu, Liu et al., 2020). Among HCWs, being a frontline worker (e.g., Zhang, Yang et al., 2020), working in a primary hospital or in a city or area most affected by COVID-19 (e.g., Dai et al., 2020), exposure to or contact with infected or suspected patients (e.g., Zhang, Wang et al., 2020), being a nurse (e.g., Lai et al., 2020), being female (e.g., Civantos et al. 2020), history of chronic disease (e.g., Zhu, Xu et al., 2020), younger age (e.g., Khanna et al., 2020), less experience (e.g., Arpacioglu et al., 2020), poorer perceived support (e.g., Song et al., 2020), inadequate protective equipment/uncertainty regarding effective disease control (e.g., Zhu, Xu et al., 2020), and low job satisfaction (e.g., Wang, Guo et al., 2020) were predictive of psychological distress. However, one study reported that male HCWs reported worse mental health (Song et al., 2020) and three studies found worse mental health outcomes among participants with more work experience (Xiao et al., 2020; Zhu, Xu et al., 2020) or no differences in mental health based on work experience (Huang et al., 2020). Several studies also showed poor mental health in enterprise owners and agricultural workers (Tian et al., 2020), professional workers (Morgul et al., 2020; Wang, Di et al., 2020), and students (Naser et al., 2020; Ustun, 2020; Wang, Pan et al., 2020). Finally, five studies found no

differences in mental health based on occupation (Blbas et al., 2020; Moccia et al., 2020), employment status (Mappa et al., 2020), income (Blbas et al., 2020; Liu, Zhang, Wong et al., 2020), or overall socioeconomic status (Pedrozo-Pupo et al., 2020).

Place of Residence

Several studies examined the effect of place of residence on mental health outcomes, specifically with regards to urban versus rural living or living in cities or areas/states most affected by COVID-19 (e.g., Wuhan, China). Findings were mixed regarding urban versus rural living, with some studies showing that urban living predicted more adverse outcomes (Cao et al., 2020; Duan et al., 2020; Gao, Zheng et al., 2020; Karatzias et al., 2020; Özdin & Bayrak Özdin, 2020), while others found that suburban/rural living was associated with greater psychological distress (El-Zoghby et al., 2020; Lin, Hu et al., 2020; Morgul et al. 2020; Zhang, Wang et al., 2020). Three studies found no differences in mental health based on geographical location (Liu, Yang et al., 2020; Liu, Zhu et al., 2020; Moccia et al., 2020). Individuals living or working in cities or areas most affected by COVID-19 were more likely to report worse outcomes (Dai et al., 2020; Duan et al., 2020; Lai et al., 2020; Liu, Chen et al., 2020; Song et al., 2020; Thomaier et al., 2020; Zhou et al., 2020).

Functional Health

In terms of functional health, several studies explored the impact of having a chronic psychological or physical health condition on mental health outcomes during COVID-19. The majority of studies found that the history or presence of psychological (e.g., Durankus & Aksu, 2020; Özdin & Bayrak Özdin, 2020; Seyahi et al., 2020; Solomou & Constantinidou, 2020) or physical health conditions, including poorer perceived health (e.g., Gualano et al., 2020; Hao, Zhou et al., 2020; Ozamiz-Etxebarria et al., 2020; Wu et al., 2020), predicted adverse mental health outcomes, particularly in individuals who reported both psychological and physical health conditions (Alonzi et al., 2020). Five studies also investigated the effect of COVID-19

on mental health and found that physical symptoms or COVID-19 diagnosis predicted worse outcomes (Gómez-Salgado et al., 2020; Guo et al., 2020; Iob et al., 2020; Liu, Chen et al., 2020; Wang, Pan et al., 2020). Additionally, one study found that using psychotropic drugs or sleeping remedies predicted worse mental health (Costantini & Mazzotti, 2020). Contrary to our expectations, three studies found no effect of a pre-existing health condition on mental health outcomes (Moccia et al., 2020; Pedrozo-Pupo et al., 2020; Ustun, 2020) and one study found that the COVID-19 outbreak increased anxiety and depression only in participants who did not have pre-existing symptoms consistent with generalised anxiety or depression (Flentje et al., 2020).

Migrant Status and Ethnicity

Ten studies investigated the effect of ethnicity and migrant status on mental health outcomes during COVID-19 and found that individuals who identified as Black, Native American, Asian, or Hispanic (Fitzpatrick et al., 2020a, 2020b, 2020c; Park et al., 2020; Taubman–Ben-ari et al., 2020), as belonging to Black, Asian, and Minority Ethnic (BAME) groups (Iob et al., 2020; Kimhi et al., 2020), or as migrant workers (Qiu et al., 2020) generally reported worse mental health than individuals who identified as White or as non-migrant workers. One study found no effect of ethnicity on mental health outcomes (Umucu & Lee, 2020) and one study found worse mental health in individuals who identified as White compared to individuals who identified as Asian or Hispanic (Liu, Zhang, Wong et al., 2020).

Gender Identity

Two studies investigated the effects of gender identity on mental health outcomes during COVID-19 and found that nonbinary and transgender participants reported the highest levels of mental health symptoms (Alonzi et al., 2020; Liu, Zhang, Wong et al., 2020).

Sexual Orientation

Finally, in terms of sexual orientation, two studies found worse outcomes among cisgender gay men and other men who have sex with men (Santos et al., 2020) and sexual minority participants (Park et al., 2020), particularly among individuals who lost employment due to COVID-19 (Santos et al., 2020).

Discussion

The present paper represents the first review to investigate the effect of health inequality factors on mental health outcomes during the ongoing COVID-19 pandemic. The findings show that several personal and social inequality factors are likely to increase risk for adverse mental health outcomes. Specifically, female sex, being of a younger age, financial insecurity, having access to clear messaging/information about the pandemic, proximity to large infection sites, having existing physical and/or psychological health conditions, and being subjected to abuse/stigma because of one's identity as belonging to an ethnic or sexual marginalised group appear to predict mental health inequalities during the COVID-19 outbreak.

Regarding participant sex, although there were several exceptions that showed no differences between sexes or worse mental health in men, the majority of studies included in this review found that mental health outcomes during COVID-19 are worse in women. This is seemingly in contradiction to clinical research showing that while men and women have the same likelihood of contracting COVID-19, men have an increased risk of fatality (Gebhard et al., 2020; Qin et al., 2020), due to biological differences which may predispose men to a widespread COVID-19 infection and poorer prognosis (Conti & Younes, 2020; Giagulli et al., 2020; Walter & McGregor, 2020). However, despite being relatively safer from COVID-19-related complications, women consistently report higher levels of depression, anxiety, and stress, and lower levels of resilience in response to the current outbreak. This is in line with previous research that shows that women generally have a higher prevalence of PTSD (Farhood et al., 2018). There are several possible reasons for this, including women's work-life balance,

gender roles and responsibilities, domestic violence, harassment at work, and work roles (Gausman & Langer, 2020; Viveiros & Bonomi, 2020). For instance, many HCWs (e.g., nurses) are female and female HCWs are more likely to work in lower paid roles with several responsibilities (López-Atanes et al., 2020; Makino et al., 2020). Previous reviews have found that nurses are particularly prone to poor mental health outcomes during outbreaks and national emergencies (e.g., Lai et al., 2020). At the same time, due to traditional gender roles in many countries worldwide, women also hold the primary responsibility for housework and child-rearing (Kantamneni, 2020). People with responsibilities and concerns for others (e.g., carers, parents, and individuals with younger siblings) often report more adverse mental health outcomes (Fitzpatrick et al., 2020c; Jiang et al., 2020; Park et al., 2020). Especially in times of emergency, such as during the ongoing COVID-19 outbreak, female HCWs with children have to balance an increased workload at the same time as increased childcare, due to widespread school closures (Makino et al., 2020). Findings from this review further show that female sex, younger age, and less experience predict worse mental health outcomes in HCWs. However, at present, such findings are mostly correlational in nature, and future research is required to assess how sex interacts with other factors to impact mental health.

Likewise, in interpreting these results, it is important to bear in mind the prevalent stigma regarding men's mental health, which may cause men to underreport mental health issues. This is particularly true in societies where masculinity is valued in terms of 'strength' and mental illness is viewed as a 'weakness' (Wong, Ho, et al., 2016), which may lead to harmful strategies such as excess alcohol consumption (Ahmed, Ahmed, Albao et al., 2020). Indeed, there is evidence that ways of regulating emotions may contribute to men's poorer mental health outcomes in certain circumstances (Song et al., 2020). Furthermore, such societies may also expect men to be family providers, thereby disproportionately affecting men's mental health if they feel that their job or finances are at risk (Liang, Gao, et al., 2020).

These individuals may also find themselves unable to cope with increased household responsibilities as a result of lockdown measures (Verma & Mishra, 2020). Other authors have argued that their findings concerning sex differences may reflect a bias in sampling, such that the typically smaller subset of men making up the sample only agreed to take part in the study to voice their concerns about the crisis (Ozamiz-Etxebarria et al., 2020). Thus, it is worth noting that reported sex differences in mental health might actually represent *gender* differences.

In terms of age differences, a significant number of studies found that younger adults (<35 years) (as well as adolescents approaching adulthood; Duan et al., 2020, Zhou et al., 2020) reported poorer mental health outcomes compared to middle-aged and older adults, despite being statistically safer from the physical effects of the virus. In understanding this result, it is important to bear in mind that, as an age group, young adults are more likely to work jobs either deemed essential (such as service jobs), where they may be at increased risk of infection, or jobs with zero-hour contracts, leaving them financially insecure and at an increased risk of unemployment. It is also possible that this age group feels they are doing more to shoulder the burden and are ensuring that they do not become infected and pass it on to vulnerable loved ones, such as parents and grandparents (Zhu, Xu et al., 2020). As an age group, they may also be going through a number of significant life events for the first time, which are unfortunately being affected by the ongoing pandemic. Pregnant women, for example, were shown to have significantly more anxieties about their unborn children than pregnant women before COVID-19 (Berthelot et al., 2020; Wu et al., 2020) and women who were having children for the first time were especially anxious (Taubman–Ben-Ari et al., 2020). Less life experience has generally shown to impact resilience as well as mental health outcomes during previous pandemics (see Schneider at al., 2020 for a review), which may also contribute to this difference.

Counterintuitively, trying to obtain more information and oversaturating oneself with news and information from social media (which younger adults are arguably more likely to engage in) has shown to be related to worse mental health outcomes (Arpacioglu et al., 2020; Cortes-Alvarez et al., 2020; Duan et al., 2020; Gao et al., 2020; Hao, Zhou et al., 2020; Seyahi et al., 2020; Zhang, Yang et al., 2020), which some authors have used as a way of explaining differences in distress across age groups (Qui et al. 2020). In fact, time spent following news reports of the outbreak, use of social media, internet addiction, and perceived lack of helpfulness in psychological support from news/social media were associated with psychological distress across all populations (Arpacioglu et al., 2020; Cortes-Alvarez et al., 2020; Duan et al., 2020; Gao et al., 2020; Hao, Zhou et al., 2020; Seyahi et al., 2020; Zhang, Yang et al., 2020). However, this association could be bidirectional such that individuals with more underlying anxiety may spend more time following news reports of the outbreak. On the other hand, awareness and knowledge of COVID-19 and protective measures were protective of psychological distress (Huang et al., 2020; Zhou et al., 2020). This is where differences in education may come in, as those with a higher level of learning may be better able to filter obtained information more effectively. This notion is consistent with the findings of this review, where lower education level was generally associated with poorer mental health outcomes. However, a number of studies reported no differences, and five studies identified inverse effects (Balkhi et al., 2020; Fu et al., 2020; Mappa et al., 2020; Qiu et al., 2020; Wang, Di et al., 2020). In understanding this contradiction, some research has found stress to be associated with perceived inconsistency between government arrangements and scientific recommendations (Pedrozo-Pupo et al., 2020). Having a higher level of education might, therefore, allow one to identify such inconsistencies more readily. Alternatively, it might indicate that one is in a position where work is directly affected by government mismanagement (i.e., HCW, scientist, etc.). Marginalised individuals may also process

information differently if they feel they are not included in public messaging, in which case higher education may make an understanding of inequalities clearer (e.g., Kimhi et al. 2020). However, at present, such explanations are speculative, and further research is required to assess to what extent education level influences mental health outcomes in a pandemic, and to identify other variables that may explain the relationship between education level and mental health.

Alternatively, highly educated professionals have shown to struggle more with interruptions to routine activities, occupations, and work relationships (Anzai et al., 2020; Kimhi et al., 2020; Wang et al., 2020). This is supported by some of the work identified in this review, including studies which showed worse mental health in enterprise owners and agricultural workers (Tian et al., 2020), professional workers (Morgul et al., 2020; Wang, Di, et al., 2020), and students (Naser et al., 2020; Ustun, 2020; Wang, Pan et al., 2020). HCWs' mental health has also shown to be disproportionally affected by COVID-19, but this may have more to do with increased pressures at work and proximity to infected patients (Naser et al., 2020; Zhang, Yang et al., 2020; Zhang, Wang et al., 2020). Instead, enterprise owners, agricultural workers, and students may report higher levels of stress because of a sense of insecurity that COVID-19 has enforced upon their working lives. Enterprise owners may be concerned about the survival of their business and their employees' jobs, while students may be concerned about their grades and long-term prospects. Indeed, employment (and indirect or subsequent financial) insecurity were consistent predictors of distress and greater mental health symptomatology (Khanna et al., 2020; Iob et al., 2020; Lei et al., 2020; Park et al., 2020; Thomaier et al., 2020).

Another inequality factor identified in the current review was participants' place of residence. Previous research has shown that living in rural areas can negatively affect access to healthcare, such that preventable and treatable mortality rates increase as one becomes more

remote, even in countries such as Canada which have universal healthcare systems (Subedi et al., 2019). Likewise, people from rural areas are typically less likely than urban residents to seek or receive mental health services (Carpenter-Song & Snell-Rood, 2017) and are at increased risk for suicide (Monteith et al., 2020). However, our findings show that the effects of rural inequalities on mental health during COVID-19 are inconsistent, such that rural (or suburban) living predicted worse mental health outcomes in some studies (El-Zoghby et al., 2020; Lin, Hu et al., 2020; Morgul et al. 2020; Zhang, Wang et al., 2020), while urban and city living predicted worse mental health outcomes in an almost equal number of other studies (Cao et al., 2020; Duan et al., 2020; Gao, Zheng et al., 2020; Karatzias et al., 2020; Özdin & Bayrak Özdin, 2020). One possible explanation for this finding is that cities were more likely to have higher infection rates, putting people closer to the pandemic, which has shown to negatively impact mental health (Dai et al., 2020; Duan et al., 2020; Lai et al., 2020; Liu, Chen et al., 2020; Song et al., 2020; Thomaier et al., 2020; Zhou et al., 2020). If so, being more 'remote' might correlate with higher perceived safety and, consequently, improved mental health.

Nonetheless, being a rural resident during COVID-19 still comes with its challenges, and differences in studies may reflect subtle variations across countries and their rural areas' access to healthcare, as well as social support, living with others, online health support availability, and availability of transport/access to hospitals (Kaufman et al., 2020, Monteith et al., 2020, Summers-Gabr, 2020). Studies included in this review often assessed place of residence as a dichotomy (i.e., urban versus rural living), thereby ignoring the nuance of remoteness. A study by Subedi et al. (2019) showed that rural Canadians' healthcare, for example, was determined by their remoteness from everything else, such that the further away from society one was, the poorer one's health was. People living in urban communities outside of Montreal, for example, may very well have different experiences of healthcare than residents of Canada's Arctic Archipelago. Not only may the Montreal suburbanites have more local

hospitals/clinics, but they are also more likely to have better access to social support systems. Indeed, feeling lonely (Horesh et al., 2020), experiencing quarantine alone (Lei et al., 2020; Sun et al., 2020), not having children (Mazza et al., 2020), being single, divorced, or widowed (Cortes-Alvarez et al., 2020; Fitzpatrick et al., 2020a, 2020b; Gualano et al., 2020; Khanna et al., 2020; Liang, Ren et al., 2020; Naser et al., 2020; Peng et al., 2020; Shacham et al., 2020; Stanton et al., 2020; Tian et al., 2020; Wang, Xia et al., 2020), and living alone (Cao et al., 2020; Gualano et al., 2020; Jiang et al., 2020) have shown to predict poorer mental health outcomes as a result of a real or perceived lack of psychological and social support (Lei et al., 2020; Song et al., 2020).

Furthermore, having access to healthcare during the ongoing pandemic is particularly important if one is already living with a long-term condition. Indeed, physical long-term conditions (such as cancer, diabetes, HIV, cardiovascular disease, etc.) are associated with an increased risk for psychological distress, depression, and anxiety even under 'normal' circumstances (Sartorious, 2013). Given that hospitals and clinics are currently prioritising treatment for COVID-19 patients, there is evidence that people with chronic conditions are avoiding or are unable to access healthcare services, causing them even greater psychological harm (Mauro et al., 2020). Of the reviewed papers that examined chronic health inequalities, the majority showed that having a physical or mental health condition (or perceiving one's health as poor; Lei et al., 2020) resulted in worse mental health outcomes. Individuals who reported concurrent physical and mental health conditions reported worse mental health during COVID-19 than participants who reported either a physical or mental health condition (Alonzi et al., 2020). Additionally, physical symptoms or a diagnosis of COVID-19 were also shown to predict worse mental health, further demonstrating the psychological effects of coming into (real or perceived) contact with the virus.

The present review found a lack of evidence surrounding the effects of migrant status and ethnicity, gender identity, and sexual orientation on mental health outcomes during the COVID-19 pandemic. Only ten studies examined the impact of ethnicity and migrant status on mental health, despite clear evidence that both act as significant risk factors for poor physical and mental health outcomes (Public Health Agency of Canada, 2018). Indeed, people of colour, migrants, and Indigenous groups experience different access to healthcare than the majority of White populations in Western countries and have shown to be at higher risk for various health conditions due to a range of social factors, including stigma (Gary, 2005; Knifton et al., 2008; Williams & Mann, 2017). Furthermore, as marginalised individuals, their unique, cultural needs are often ignored or used to blame them for developing long-term conditions, which likely contributes further to distress and poor psychological well-being. For instance, Indigenous people typically see health as based on a reciprocal relationship between emotional, spiritual, physical, and mental dimensions, which is vastly different from the typical approaches of White Western healthcare systems (Reading & Greenwood, 2015), and may contribute to health inequalities. Although the articles included in this review provide some correlational evidence for differences in mental health by ethnicity and migrant status, the authors often do not attempt to discuss differences between groups or provide explanations for their findings. The apparent low focus on ethnicity with regards to the effects of the current pandemic is not unique to research, as even public health bodies have been criticised for failing to address ethnicity differences, despite evidence that COVID-19 death rates are higher in BAME participants (e.g., in the United Kingdom) (Patel et al., 2020). Furthermore, a survey reported in the British Medical Journal found that doctors from marginalised ethnic groups not only feel more pressured, but also less protected than their White colleagues, after it was discovered that 90% of doctors who have lost their lives to COVID-19 in the United Kingdom were from minoritized ethnic backgrounds (Mahase, 2020). As such, a greater focus on the

effects of ethnicity and migrant status on mental health in relation to COVID-19 is required, especially given that the risk for infection and mortality is disproportionate in marginalised individuals. Moreover, ethnicity-related differences should be taken into consideration when planning healthcare intervention strategies, that holistically integrate the most valued approaches from each culture.

Members of the LGBTQ+ community are likewise marginalised (and often ignored in wider public health messaging), and gender identity and sexual orientation have so far received little attention during the pandemic. Two studies included in this review considered the needs of people who exist outside of traditional gender norms and found that non-binary individuals had higher levels of depression and anxiety following the COVID-19 pandemic (Alonzi et al., 2020) and that people who identified as transgender were more likely to report higher levels of PTSD symptoms than cisgender individuals (Liu, Zhang, Wong et al., 2020). In terms of sexuality, cisgender gay men and other men who have sex with men reported poor mental health consequences of the COVID-19 pandemic, in part due to increased financial insecurity (as aforementioned) and interruptions to healthcare, especially around HIV prevention, testing, and treatment services (Santos et al. 2020). Similarly, sexual minority participants reported to be more stressed by rumination and co-worry with others, and to utilise more damaging coping strategies, such as substance use and behaviour disengagement (Park et al., 2020). Evidently, more research is also needed to address the specific health needs of these individuals (Salerno et al., 2020). More focused studies are essential for these populations specifically, but including gender identity and sexual orientation information as demographic questions across all studies should also be encouraged.

Intersectional Differences

To fully appreciate the impact of inequality factors on psychological well-being during the COVID-19 pandemic, it is important to note that inequality factors such as those discussed

so far often interact to increase or decrease mental illness risk. In the present review, sexual orientation was shown to correlate with job security (Santos et al., 2020), while education level moderated distress differently across ethnicity groups (Kimhi et al., 2020). Other research has shown that area of residence may influence the kind of care that Indigenous Canadians receive (Subedi et al., 2019) and that long-term conditions (which lead to disability) may potentially affect job security during this time (Richmond, 2009). However, to date, few studies have considered intersectionality between inequality factors (e.g., women of colour, younger individuals with chronic conditions, unemployed LGBTQ+ participants), highlighting an urgent need for future research to fill this gap. Furthermore, few studies have so far considered mediators or moderators that might impact and explain the relationships between inequality factors and mental health outcomes. For instance, social media use, living with parents, social support, and economic stability could explain the relationship between age or education level with mental health outcomes. Similarly, being a nurse, poor work-life balance, lower income, violence at home, higher workload, and more home responsibilities may explain the relationship between sex and mental health outcomes in HCWs. Research has also suggested that distal variables, such as mistrust for government institutions, may explain mental health differences (e.g., Pedrozo-Pupo et al., 2020) and is something that should be considered by future researchers, particularly given that such variables may be influenced by minority or marginalised status.

Strengths, Limitations, and Future Directions

The strengths of this review include: (1) providing a comprehensive assessment of various inequality factors influencing mental health outcomes during the ongoing COVID-19 pandemic to date; (2) including a preliminary exploration of intersectionality between inequality factors; and (3) providing recommendations for best practice based on empirical findings from a large number of studies and participant samples. Importantly, this review not

only highlights specific aspects of inequality that require attention and more research (such as ethnicity and sexual orientation), but it also identifies a lack of studies exploring intersectionality between inequality factors, which is a crucial gap. Going forward, work must continue into investigating the complexities of inequality and their effects on mental health. Despite the rigorous search criteria and study reviews conducted, this review is not without limitations. The majority of studies included in this review were cross-sectional by design and were rated as either weak or moderate in quality. There has been a distinct lack of longitudinal research, and instead most studies simply made correlational observations. Assessing differences over time, and distinguishing more clearly between different participant groups, will greatly increase the quality of future work and allow for a more robust understanding concerning mental health differences across inequality factors. Finally, there were several potentially vulnerable subgroups not included in the current review, such as individuals experiencing homelessness, and Indigenous and marginalised populations (such as Canadian Métis and Inuit Peoples). This is a significant limitation given the prominence of these populations in Canada and the differences between Indigenous and non-Indigenous people with regards to how they view health (Public Health Agency of Canada, 2018). Thus, more research should be conducted with and alongside these population groups so that their individual support and well-being needs can be identified.

Overall, the findings of this review highlight the impact of inequality factors on mental health outcomes during the ongoing COVID-19 pandemic and demonstrate an urgent need for increasing accessibility to, and provision of, mental health services, particularly for at-risk individuals and under-supplied locations. Such efforts require nationwide strategic planning and coordination, and special efforts should be undertaken to ensure a comprehensive crisis prevention and intervention system, including epidemiological monitoring, screening, referral, and targeted interventions to reduce psychological distress and prevent further mental health

problems and mental health inequalities (Qiu et al., 2020). Preventative measures such as clear messaging around the virus and ensuring support for marginalised and at-risk groups is also essential. Additionally, more research is required on how inequality affects mental health, particularly in less studied vulnerable populations (e.g., ethnic, sexual, and gender marginalised participants). Future research should necessarily explore the intersectionality between inequality factors and consider possible confounding variables that may mediate or moderate the effect of inequality on mental health outcomes. Recommendations for researchers, mental health practitioners, and public health authorities for mitigating adverse mental health outcomes in vulnerable populations are summarised in Box 1. The information provided in Box 1 can be delivered directly to employers or distributed across workplaces (e.g., hospitals and care homes), included in national campaigns around COVID-19, and referred to by those doing research related to mental health during the ongoing outbreak. A summarised version of the information provided in Box 1 (see Figure 3) can further be disseminated to the general public (e.g., through social media) to increase awareness of mental health inequalities during COVID-19.

[Box 1 around here]

[Fig. 3 around here]

Conclusions

Although COVID-19 has previously been described as ‘the great equalizer’, the findings of the current review show that this is not the case when it comes to mental health outcomes. The current review found that female sex, being of a younger age, financial insecurity, having access to clear messaging/information about the pandemic, proximity to large infection sites, having existing physical and/or psychological health conditions, and being subjected to abuse/stigma because of one’s identity as belonging to an ethnic or sexual marginalised group appear to predict mental health inequalities during the COVID-19

outbreak. However, at present, little is known about how inequality factors interact to predict mental health in the short and long term. Of note, some researchers have argued that outbreaks and other emergencies may also have positive mental health outcomes on a subset of the population, at least in the long term, through improved social relationships and connections, increased feelings of belonging in the community, and reduced anxiety and depression (Mancini, 2019, 2020), although much of the evidence regarding COVID-19 specifically has so far been anecdotal. The primary aim of future research should therefore be to ensure that the mental health gap is not further widened between advantaged and disadvantaged populations in the aftermath of the current pandemic. Specifically, findings of this review highlight the inequality factors that need to be targeted as a priority to reduce the adverse psychological outcomes in vulnerable populations and increase the potential for increased psychological functioning.

References

Aafjes-van Doorn, K., Békés, V., Prout, T. A., & Hoffman, L. (2020). Psychotherapists' vicarious traumatization during the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*, 148–150. https://doi.org/10.1037/tra0000868

Ahmed, F., Ahmed, N., Pissarides, C., & Stiglitz, J. (2020). Why inequality could spread COVID-19. *The Lancet Public Health*, *5*(5), e240. https://doi.org/10.1016/S2468-2667(20)30085-2

Ahmed, M. Z., Ahmed, O., Aibao, Z., Hanbin, S., Siyu, L., & Ahmad, A. (2020). Epidemic of COVID-19 in China and associated psychological problems. *Asian Journal of Psychiatry*, *51*, 102092. https://doi.org/10.1016/j.ajp.2020.102092

Al Sulais, E., Mosli, M., & AlAmeel, T. (2020). The psychological impact of COVID-19 pandemic on physicians in Saudi Arabia: A cross-sectional study. *The Saudi Journal of Gastroenterology*, (23), 301–316. https://doi.org/10.15797/concom.2019..23.009

Alonzi, S., La Torre, A., & Silverstein, M. W. (2020). The psychological impact of preexisting mental and physical health conditions during the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice and Policy, 12*(S1), S236–S238. https://doi.org/10.1037/tra0000840

Antunes, R., Frontini, R., Amaro, N., Salvador, R., Matos, R., Morouço, P., & Rebelo-Gonçalves, R. (2020). Exploring lifestyle habits, physical activity, anxiety and basic psychological needs in a sample of Portuguese adults during COVID-19. *International Journal of Environmental Research and Public Health, 17*(12), 4360. https://doi.org/10.3390/ijerph17124360

Anzai, A., Kobayashi, T., Linton, N. M., Kinoshita, R., Hayashi, K., Suzuki, A., Yang, Y., Jung, S.M., Miyama, T., Akhmetzhanov, A.R., Nishiura, H. (2020). Assessing the

impact of reduced travel on exportation dynamics of novel Coronavirus Infection (COVID-19). *Journal of Clinical Medicine*, *9*(2), 601. https://doi.org/10.3390/jcm9020601

Armijo-Olivo, S., Stiles, C. R., Hagen, N. A., Biondo, P. D., & Cummings, G. G. (2012). Assessment of study quality for systematic reviews: A comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: Methodological research. *Journal of Evaluation in Clinical Practice*, *18*(1), 12–18. https://doi.org/10.1111/j.1365-2753.2010.01516.x

Arpacioglu, S., Gurler, M., & Cakiroglu, S. (2020). Secondary traumatization outcomes and associated factors among the health care workers exposed to the COVID-19. *The International Journal of Social Psychiatry*, 20764020940742. https://doi.org/10.1177/0020764020940742

Badahdah, A., Khamis, F., Al Mahyijari, N., Al Balushi, M., Al Hatmi, H., Al Salmi, I., Albulushi, Z., Al Noomani, J. (2020). The mental health of health care workers in Oman during the COVID-19 pandemic. *The International Journal of Social Psychiatry*, 20764020939596. https://doi.org/10.1177/0020764020939596

Balkhi, F., Nasir, A., Zehra, A., & Riaz, R. (2020). Psychological and behavioral response to the Coronavirus (COVID-19) pandemic. *Cureus*, *12*(5), e7923. https://doi.org/10.7759/cureus.7923

Benjamin, G. C. (2020). Ensuring health equity during the COVID-19 pandemic: The role of public health infrastructure. *Revista Panamericana de Salud Publica = Pan American Journal of Public Health*, Vol. 44, p. e70. https://doi.org/10.26633/RPSP.2020.70

Bergman, Y. S., Cohen-Fridel, S., Shrira, A., Bodner, E., & Palgi, Y. (2020). COVID-19 health worries and anxiety symptoms among older adults: The moderating role of

ageism. *International Psychogeriatrics*, 1–5. https://doi.org/10.1017/S1041610220001258

Berthelot, N., Lemieux, R., Garon-Bissonnette, J., Drouin-Maziade, C., Martel, É., & Maziade, M. (2020). Uptrend in distress and psychiatric symptomatology in pregnant women during the coronavirus disease 2019 pandemic. *Acta Obstetricia et Gynecologica Scandinavica*, *99*(7), 848–855. https://doi.org/10.1111/aogs.13925

Blbas, H. T. A., Aziz, K. F., Nejad, S. H., & Barzinjy, A. A. (2020). Phenomenon of depression and anxiety related to precautions for prevention among population during the outbreak of COVID-19 in Kurdistan Region of Iraq: Based on questionnaire survey. *Journal of Public Health (Germany)*. https://doi.org/10.1007/s10389-020-01325-9

Bowleg, L. (2020). We're not all in this together: On COVID-19, intersectionality, and structural inequality. *American Journal of Public Health*, *110*(7), 917–918. https://doi.org/10.2105/AJPH.2020.305766

Broche-Pérez, Y., Fernández-Fleites, Z., Jiménez-Puig, E., Fernández-Castillo, E., & Rodríguez-Martin, B. C. (2020). Gender and fear of COVID-19 in a Cuban population sample. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-020-00343-8

Bruns, D. P., Kraguljac, N. V., & Bruns, T. R. (2020). COVID-19: Facts, cultural considerations, and risk of stigmatization. *Journal of Transcultural Nursing*, *31*(4), 326–332. https://doi.org/10.1177/1043659620917724

Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, *287*, 112934. https://doi.org/10.1016/j.psychres.2020.112934

Carpenter-Song, E., & Snell-Rood, C. (2017). The changing context of rural America: A call

to examine the impact of social change on mental health and mental health care. *Psychiatric Services*, *68*(5), 503–506. https://doi.org/10.1176/appi.ps.201600024

Centers for Disease Control & Prevention. (2020). Coronavirus Disease, 2019 (COVID-19); Situation Summary. https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html

Civantos, A. M., Byrnes, Y., Chang, C., Prasad, A., Chorath, K., Poonia, S. K., Jenks, C.M., Bur, A.M., Thakkar, P., Graboyes, E.M. and Seth, R. (2020). Mental health among otolaryngology resident and attending physicians during the COVID-19 pandemic: National study. *Head and Neck*, *42*(7), 1597–1609. https://doi.org/10.1002/hed.26292

Cohen, J.A. (1960). A coefficient of agreement for nominal scales. *Educational And Psychological Measurement*, *20*(1), 37–46.

Conti, P., & Younes, A. (2020). Coronavirus COV-19/SARS-CoV-2 affects women less than men: Clinical response to viral infection. *Journal of Biological Regulators and Homeostatic Agents*, *34*(2), 339–343. https://doi.org/10.23812/Editorial-Conti-3

Cortés-Álvarez, N. Y., Piñeiro-Lamas, R., & Vuelvas-Olmos, C. R. (2020). Psychological effects and associated factors of COVID-19 in a Mexican sample. *Disaster Medicine and Public Health Preparedness*, 1–12. https://doi.org/10.1017/dmp.2020.215

Costantini, A., & Mazzotti, E. (2020). Italian validation of CoViD-19 peritraumatic distress index and preliminary data in a sample of general population. *Rivista Di Psichiatria*, *55*(3), 145–151. https://doi.org/10.1708/3382.33570

Cotrin, P., Peloso, R. M., Oliveira, R. C., de Oliveira, R. C. G., Pini, N. I. P., Valarelli, F. P., & Freitas, K. M. S. (2020). Impact of coronavirus pandemic in appointments and anxiety/concerns of patients regarding orthodontic treatment. *Orthodontics and Craniofacial Research*, (April), 1–7. https://doi.org/10.1111/ocr.12395

Dai, Y., Hu, G., Xiong, H., Qiu, H., & Yuan, X. (2020). Psychological impact of the

coronavirus disease 2019 (COVID-19) outbreak on healthcare workers in China. *MedRxiv*, 2020.03.03.20030874. https://doi.org/10.1101/2020.03.03.20030874

Devitt, P. (2020). Can we expect an increased suicide rate due to Covid-19? *Irish Journal of Psychological Medicine*, 1–5. https://doi.org/10.1017/ipm.2020.46

Dorn, A. van, Cooney, R. E., & Sabin, M. L. (2020). COVID-19 exacerbating inequalities in the US. *The Lancet*, *395*(10232), 1243–1244. https://doi.org/10.1016/s0140-6736(20)30893-x

Doshi, D., Karunakar, P., Sukhabogi, J. R., Prasanna, J. S., & Mahajan, S. V. (2020). Assessing Coronavirus fear in Indian population using the fear of COVID-19 scale. *International Journal of Mental Health and Addiction*, *2019*(March). https://doi.org/10.1007/s11469-020-00332-x

Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders*, *275*, 112–118. https://doi.org/10.1016/j.jad.2020.06.029

Durankuş, F., & Aksu, E. (2020). Effects of the COVID-19 pandemic on anxiety and depressive symptoms in pregnant women: A preliminary study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 1–7. https://doi.org/10.1080/14767058.2020.1763946

El-Zoghby, S. M., Soltan, E. M., & Salama, H. M. (2020). Impact of the COVID-19 pandemic on mental health and social support among adult Egyptians. *Journal of Community Health*, *45*(4), 689–695. https://doi.org/10.1007/s10900-020-00853-5

Farewell, C. V, Jewell, J., Walls, J., & Leiferman, J. A. (2020). A mixed-methods pilot study of perinatal risk and resilience during COVID-19. *Journal of Primary Care & Community Health*, *11*, 2150132720944074.

https://doi.org/10.1177/2150132720944074

Farhood, L., Fares, S., & Hamady, C. (2018). PTSD and gender: Could gender differences in war trauma types, symptom clusters and risk factors predict gender differences in PTSD prevalence? *Archives of Women's Mental Health, 21*, 725–733. https://doi.org/10.1007/s00737-018-0874-6

Fegert, J. M., Vitiello, B., Plener, P. L., & Clemens, V. (2020). Challenges and burden of the Coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: A narrative review to highlight clinical and research needs in the acute phase and the long return to normality. *Child and Adolescent Psychiatry and Mental Health, 14*, 20. https://doi.org/10.1186/s13034-020-00329-3

Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020a). How bad is it? Suicidality in the middle of the COVID-19 pandemic. *Suicide and Life-Threatening Behavior*. https://doi.org/10.1111/sltb.12655

Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020b). Living in the midst of fear: Depressive symptomatology among US adults during the COVID-19 pandemic. *Depression and Anxiety*. https://doi.org/10.1002/da.23080

Fitzpatrick, K. M., Harris, C., & Drawve, G. (2020c). Fear of COVID-19 and the mental health consequences in America. *Psychological Trauma: Theory, Research, Practice and Policy, 12*(S1), S17–S21. https://doi.org/10.1037/tra0000924

Flentje, A., Obedin-Maliver, J., Lubensky, M. E., Dastur, Z., Neilands, T., & Lunn, M. R. (2020, June). Depression and anxiety changes among sexual and gender minority people coinciding with onset of COVID-19 pandemic. *Journal of General Internal Medicine*, pp. 1–3. https://doi.org/10.1007/s11606-020-05970-4

Fu, W., Wang, C., Zou, L., Guo, Y., Lu, Z., Yan, S., & Mao, J. (2020). Psychological health, sleep quality, and coping styles to stress facing the COVID-19 in Wuhan, China.

Translational Psychiatry, *10*(1), 225. https://doi.org/10.1038/s41398-020-00913-3

Gabrielli, J., & Lund, E. (2020). Acute-on-chronic stress in the time of COVID-19: assessment considerations for vulnerable youth populations. *Pediatric Research*. https://doi.org/10.1038/s41390-020-1039-7

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., Wang, Y., Fu, H. & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *PLoS ONE*, *15*(4), 1–10. https://doi.org/10.1371/journal.pone.0231924

Gao, Y., Sun, F., Jiang, W., Fang, Y., Yue, L., Lin, X., & Li, X. (2020). Beliefs towards the COVID-19 pandemic among patients with emotional disorders in China. *General Psychiatry*, *33*(3), e100231. https://doi.org/10.1136/gpsych-2020-100231

Gary, F. A. (2005). Stigma: Barrier to mental health care among ethnic minorities. *Issues in Mental Health Nursing*, *26*(10), 979–999. https://doi.org/10.1080/01612840500280638

Gausman, J., & Langer, A. (2020). Sex and gender disparities in the COVID-19 pandemic. *Journal of Women's Health*, *29*(4), 465–466. https://doi.org/10.1089/jwh.2020.8472

Gebhard, C., Regitz-Zagrosek, V., Neuhauser, H. K., Morgan, R., & Klein, S. L. (2020). Impact of sex and gender on COVID-19 outcomes in Europe. *Biology of Sex Differences*, *11*(1), 29. https://doi.org/10.1186/s13293-020-00304-9

Giagulli, V. A., Guastamacchia, E., Magrone, T., Jirillo, E., Lisco, G., De Pergola, G., & Triggiani, V. (2020). Worse progression of COVID-19 in men: Is testosterone a key factor? *Andrology*. https://doi.org/10.1111/andr.12836

Gómez-Salgado, J., Andrés-Villas, M., Domínguez-Salas, S., Díaz-Milanés, D., & Ruiz-Frutos, C. (2020). Related health factors of psychological distress during the COVID-19 pandemic in Spain. *International Journal of Environmental Research and Public Health*, *17*(11). https://doi.org/10.3390/ijerph17113947

González-Sanguino, C., Ausín, B., Castellanos, M. Á., Saiz, J., López-Gómez, A., Ugidos, C., & Muñoz, M. (2020). Mental health consequences during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. *Brain, Behavior, and Immunity*, *87*(May), 172–176. https://doi.org/10.1016/j.bbi.2020.05.040

Gualano, M. R., Lo Moro, G., Voglino, G., Bert, F., & Siliquini, R. (2020). Effects of COVID-19 lockdown on mental health and sleep disturbances in Italy. *International Journal of Environmental Research and Public Health*, *17*(13), 1–13. https://doi.org/10.3390/ijerph17134779

Guo, Q., Zheng, Y., Shi, J., Wang, J., Li, G., Li, C., Fromson, J.A., Xu, Y., Liu, X., Xu, H., & Yang, Z. (2020). Immediate psychological distress in quarantined patients with COVID-19 and its association with peripheral inflammation: A mixed-method study. *Brain, Behavior, and Immunity*, *88*(April), 17–27. https://doi.org/10.1016/j.bbi.2020.05.038

Hao, F., Tan, W., Jiang, L., Zhang, L., Zhao, X., Zou, Y., Hu, Y., Luo, X., Jiang, X., McIntyre, R.S., Tam, W. (2020). Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. *Brain, Behavior, and Immunity*, *87*, 100–106. https://doi.org/10.1016/j.bbi.2020.04.069

Hao, X., Zhou, D., Li, Z., Zeng, G., Hao, N., Li, E., Li, W., Deng, A., Lin, M., Yan, B. (2020). Severe psychological distress among patients with epilepsy during the COVID-19 outbreak in southwest China. *Epilepsia*, *61*(6), 1166–1173. https://doi.org/10.1111/epi.16544

Haslam, S. A., McMahon, C., Cruwys, T., Haslam, C., Jetten, J., & Steffens, N. K. (2018). Social cure, what social cure? The propensity to underestimate the importance

of social factors for health. *Social Science & Medicine*, *198*, 14–21. https://doi.org/10.1016/j.socscimed.2017.12.020

Horesh, D., Kapel Lev-Ari, R., & Hasson-Ohayon, I. (2020). Risk factors for psychological distress during the COVID-19 pandemic in Israel: Loneliness, age, gender, and health status play an important role. *British Journal of Health Psychology*. https://doi.org/10.1111/bjhp.12455

Huang, L., Wang, Y., Liu, J., Ye, P., Cheng, B., Xu, H., Qu, H., Ning, G. (2020). Factors associated with resilience among medical staff in radiology departments during the outbreak of 2019 novel Coronavirus Disease (COVID-19): A cross-sectional study. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, *26*, e925669. https://doi.org/10.12659/MSM.925669

Huang, Y., & Zhao, N. (2020). Mental health burden for the public affected by the COVID-19 outbreak in China: Who will be the high-risk group? *Psychology, Health & Medicine*, 1–12. https://doi.org/10.1080/13548506.2020.1754438

Iob, E., Steptoe, A., & Fancourt, D. (2020). Abuse, self-harm and suicidal ideation in the UK during the COVID-19 pandemic. *The British Journal of Psychiatry: The Journal of Mental Science*, 1–4. https://doi.org/10.1192/bjp.2020.130

Jahrami, H., BaHammam, A. S., AlGahtani, H., Ebrahim, A., Faris, M., AlEid, K., Saif, Z., Haji, E., Dhahi, A., Marzooq, H. and Hubail, S. (2020). The examination of sleep quality for frontline healthcare workers during the outbreak of COVID-19. *Sleep & Breathing = Schlaf & Atmung*, 1–9. https://doi.org/10.1007/s11325-020-02135-9

Jetten, J., Reicher, S. D., Haslam, A. S., & Cruwys, T. (2020). *Together apart the psychology of COVID-19* (A. Maher). London: SAGE Publications Ltd.

Jiang, H. J., Nan, J., Lv, Z. Y., & Yang, J. (2020). Psychological impacts of the COVID-19 epidemic on Chinese people: Exposure, post-traumatic stress symptom, and emotion

regulation. *Asian Pacific Journal of Tropical Medicine*, *13*(6), 252–259. https://doi.org/10.4103/1995-7645.281614

Johnson-Mann, C., Hassan, M., & Johnson, S. (2020). COVID-19 pandemic highlights racial health inequities. *The Lancet Diabetes and Endocrinology*, *8*(8), 663–664. https://doi.org/10.1016/S2213-8587(20)30225-4

Kantamneni, N. (2020). The impact of the COVID-19 pandemic on marginalized populations in the United States: A research agenda. *Journal of Vocational Behavior*, *119*(May), 1–4. https://doi.org/10.1016/j.jvb.2020.103439

Kapilashrami, A., & Bhui, K. (2020). Mental health and COVID-19: Is the virus racist? *The British Journal of Psychiatry: The Journal of Mental Science*, 1–3. https://doi.org/10.1192/bjp.2020.93

Karatzias, T., Shevlin, M., Murphy, J., McBride, O., Ben-Ezra, M., Bentall, R. P., Vallières, F., Hyland, P. (2020). Posttraumatic stress symptoms and associated comorbidity during the COVID-19 pandemic in Ireland: A population-based study. *Journal of Traumatic Stress*, *0*, 1–6. https://doi.org/10.1002/jts.22565

Kaufman, B. G., Whitaker, R., Pink, G., & Holmes, G. M. (2020). Half of rural residents at high risk of serious illness due to COVID-19, creating stress on rural hospitals. *The Journal of Rural Health*, *00*, 1–7. https://doi.org/10.1111/jrh.12481

Kaufman, K. R., Petkova, E., Bhui, K. S., & Schulze, T. G. (2020). A global needs assessment in times of a global crisis: World psychiatry response to the COVID-19 pandemic. *BJPsych Open*, *6*(3), e48. https://doi.org/10.1192/bjo.2020.25

Kavčič, T., Avsec, A., & Zager Kocjan, G. (2020). Psychological functioning of Slovene adults during the COVID-19 pandemic: Does resilience matter? *Psychiatric Quarterly*. https://doi.org/10.1007/s11126-020-09789-4

Kelly, B. D. (2020). Coronavirus disease: Challenges for psychiatry. *The British Journal of*

Psychiatry: The Journal of Mental Science, *217*(1), 352–353. https://doi.org/10.1192/bjp.2020.86

Khanna, R. C., Honavar, S. G., Metla, A. L., Bhattacharya, A., & Maulik, P. K. (2020). Psychological impact of COVID-19 on ophthalmologists-in-training and practising ophthalmologists in India. *Indian Journal of Ophthalmology*, *68*, 994–998. https://doi.org/10.4103/ijo.IJO

Kimhi, S., Eshel, Y., Marciano, H., & Adini, B. (2020). Distress and resilience in the days of COVID-19: Comparing two ethnicities. *International Journal of Environmental Research and Public Health*, *17*(11). https://doi.org/10.3390/ijerph17113956

Kirby, T. (2020). Evidence mounts on the disproportionate effect of COVID-19 on ethnic minorities. *The Lancet Respiratory Medicine*, *8*(6), 547–548. https://doi.org/10.1016/s2213-2600(20)30228-9

Kisely, S., Warren, N., McMahon, L., Dalais, C., Henry, I., & Siskind, D. (2020). Occurrence, prevention, and management of the psychological effects of emerging virus outbreaks on healthcare workers: Rapid review and meta-analysis. *BMJ (Clinical Research Ed.)*, *369*, m1642. https://doi.org/10.1136/bmj.m1642

Knifton, L., Gervais, M., Newbigging, K., Mirza, N., Quinn, N., Wilson, N., & Hunkins-Hutchison, E. (2010). Community conversation: Addressing mental health stigma with ethnic minority communities. *Social Psychiatry and Psychiatric Epidemiology*, *45*(4), 497–504. https://doi.org/10.1007/s00127-009-0095-4

Kokou-Kpolou, C. K., Megalakaki, O., Laimou, D., & Kousouri, M. (2020). Insomnia during COVID-19 pandemic and lockdown: Prevalence, severity, and associated risk factors in French population. *Psychiatry Research*, *290*, 113128. https://doi.org/10.1016/j.psychres.2020.113128

Kontoangelos, K., Economou, M., & Papageorgiou, C. (2020). Mental health effects of

COVID-19 pandemia: A review of clinical and psychological traits. *Psychiatry Investigation*, *17*(6), 491–505. https://doi.org/10.30773/pi.2020.0161

Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to Coronavirus disease 2019. *JAMA Network Open*, *3*(3), e203976. https://doi.org/10.1001/jamanetworkopen.2020.3976

Lapalme, J., Haines-Saah, R., & Frohlich, K. L. (2019). More than a buzzword: How intersectionality can advance social inequalities in health research. *Critical Public Health*, *00*(00), 1–7. https://doi.org/10.1080/09581596.2019.1584271

Lei, L., Huang, X., Zhang, S., Yang, J., Yang, L., & Xu, M. (2020). Comparison of prevalence and associated factors of anxiety and depression among people affected by versus people unaffected by quarantine during the COVID-19 epidemic in Southwestern China. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*, *26*, e924609. https://doi.org/10.12659/MSM.924609

Li, L. Z., & Wang, S. (2020). Prevalence and predictors of general psychiatric disorders and loneliness during COVID-19 in the United Kingdom. *Psychiatry Research*, *291*(June), 113267. https://doi.org/10.1016/j.psychres.2020.113267

Liang, L., Gao, T., Ren, H., Cao, R., Qin, Z., Hu, Y., Li, C., Mei, S. (2020). Post-traumatic stress disorder and psychological distress in Chinese youths following the COVID-19 emergency. *Journal of Health Psychology*, 1359105320937057. https://doi.org/10.1177/1359105320937057

Liang, L., Ren, H., Cao, R., Hu, Y., Qin, Z., Li, C., & Mei, S. (2020). The effect of COVID-19 on youth mental health. *The Psychiatric Quarterly*, 1–12. https://doi.org/10.1007/s11126-020-09744-3

Lin, L.Y., Wang, J., Ou-Yang, X.Y., Miao, Q., Chen, R., Liang, F.X., Zhang, Y.P., Tang, Q., Wang, T. (2020). The immediate impact of the 2019 novel coronavirus (COVID-19) outbreak on subjective sleep status. *Sleep Medicine*. https://doi.org/10.1016/j.sleep.2020.05.018

Lin, Y., Hu, Z., Alias, H., & Wong, L. P. (2020). Knowledge, attitudes, impact, and anxiety regarding COVID-19 infection among the public in China. *Frontiers in Public Health*, *8*, 236. https://doi.org/10.3389/fpubh.2020.00236

Liu, C.Y., Yang, Y.Z., Zhang, X.M., Xu, X., Dou, Q.-L., Zhang, W.W., & Cheng, A. S. K. (2020). The prevalence and influencing factors in anxiety in medical workers fighting COVID-19 in China: A cross-sectional survey. *Epidemiology and Infection*, *148*, e98. https://doi.org/10.1017/S0950268820001107

Liu, C. H., Zhang, E., Wong, G. T. F., Hyun, S., & Hahm, H. C. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for U.S. young adult mental health. *Psychiatry Research*, *290*, 113172. https://doi.org/10.1016/j.psychres.2020.113172

Liu, J., Zhu, Q., Fan, W., Makamure, J., Zheng, C., & Wang, J. (2020). Online mental health survey in a medical college in China during the COVID-19 outbreak. *Frontiers in Psychiatry*, *11*, 459. https://doi.org/10.3389/fpsyt.2020.00459

Liu, N., Zhang, F., Wei, C., Jia, Y., Shang, Z., Sun, L., Zhou, Y., Wang, Y., Liu, W. (2020). Prevalence and predictors of PTSS during COVID-19 outbreak in China hardest-hit areas: Gender differences matter. *Psychiatry Research*, *287*(March), 112921. https://doi.org/10.1016/j.psychres.2020.112921

Liu, Xi, Luo, W.T., Li, Y., Li, C.N., Hong, Z.S., Chen, H.L., Xiao, F., Xia, J.Y. (2020). Psychological status and behavior changes of the public during the COVID-19 epidemic in China. *Infectious Diseases of Poverty*, *9*(1), 58.

https://doi.org/10.1186/s40249-020-00678-3

Liu, Xiyao, Chen, M., Wang, Y., Sun, L., Zhang, J., Shi, Y., Wang, J., Zhang, H., Sun, G., Baker, P.N., Luo, X. (2020). Prenatal anxiety and obstetric decisions among pregnant women in Wuhan and Chongqing during the COVID-19 outbreak: A cross-sectional study. *BJOG: An International Journal of Obstetrics and Gynaecology*. https://doi.org/10.1111/1471-0528.16381

López-Atanes, M., Recio-Barbero, M., & Sáenz-Herrero, M. (2020). Are women still "the other"? Gendered mental health interventions for health care workers in Spain during COVID-19. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(S1), S243–S244. https://doi.org/10.1037/tra0000751

Lund, E. M. (2020). Even more to handle: Additional sources of stress and trauma for clients from marginalized racial and ethnic groups in the United States during the COVID-19 pandemic. *Counselling Psychology Quarterly*, *00*(00), 1–10. https://doi.org/10.1080/09515070.2020.1766420

Ma, Y. F., Li, W., Deng, H. B., Wang, L., Wang, Y., Wang, P. H., Bo, H.X., Cao, J., Wang, Y., Zhu, L.Y., Yang, Y (2020). Prevalence of depression and its association with quality of life in clinically stable patients with COVID-19. *Journal of Affective Disorders*, *275*(April), 145–148. https://doi.org/10.1016/j.jad.2020.06.033

Ma, Z. F., Zhang, Y., Luo, X., Li, X., Li, Y., Liu, S., & Zhang, Y. (2020). Increased stressful impact among general population in mainland China amid the COVID-19 pandemic: A nationwide cross-sectional study conducted after Wuhan city's travel ban was lifted. *The International Journal of Social Psychiatry*, 20764020935489. https://doi.org/10.1177/0020764020935489

Maarefvand, M., Hosseinzadeh, S., Farmani, O., Safarabadi Farahani, A., & Khubchandani, J. (2020). Coronavirus outbreak and stress in Iranians. *International Journal of*

Environmental Research and Public Health, *17*(12). https://doi.org/10.3390/ijerph17124441

Maguire, S., & O'Shea, F. (2020). Social isolation due to the COVID-19 pandemic has led to worse outcomes in females with inflammatory arthritis. *Irish Journal of Medical Science*, 1–6. https://doi.org/10.1007/s11845-020-02307-2

Mahase, E. (2020). Covid-19: Ethnic minority doctors feel more pressured and less protected than white colleagues, survey finds. *BMJ (Clinical Research Ed.)*, *369*, m2264. https://doi.org/10.1136/bmj.m2264

Makino, M., Kanie, A., Nakajima, A., & Takebayashi, Y. (2020). Mental health crisis of Japanese health care workers under COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(S1), S136–S137. http://dx.doi.org/10.1037/tra0000819

Mancini, A. D. (2019). When acute adversity improves psychological health: A social-contextual framework. *Psychological Review*, *126*(4), 486–505. https://doi.org/10.1037/rev0000144

Mancini, A. D. (2020). Heterogeneous mental health consequences of COVID-19: Costs and benefits. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(S1), 15–16. https://doi.org/10.1037/tra0000894

Mappa, I., Distefano, F. A., & Rizzo, G. (2020). Effects of coronavirus 19 pandemic on maternal anxiety during pregnancy: A prospectic observational study. *Journal of Perinatal Medicine*. https://doi.org/10.1515/jpm-2020-0182

Marazziti, D., Pozza, A., Di Giuseppe, M. D., & Conversano, C. (2020). The Psychosocial impact of COVID-19 pandemic in Italy: A lesson for mental health prevention in the first severely hit European country. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(5), 531–533. https://doi.org/10.1037/tra0000687

Marmot, M. (2015). The health gap: The challenge of an unequal world. *The Lancet*, *386*(10011), 2442–2444. https://doi.org/10.1016/S0140-6736(15)00150-6

Mauro, V., Lorenzo, M., Paolo, C., & Sergio, H. (2020). Treat all COVID 19-positive patients, but do not forget those negative with chronic diseases. *Internal and Emergency Medicine*, 1–4. https://doi.org/10.1007/s11739-020-02395-z

Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C., & Roma, P. (2020). A Nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: Immediate psychological responses and associated factors. *International Journal of Environmental Research and Public Health*, *17*(9). https://doi.org/10.3390/ijerph17093165

Meo, S. A., Abukhalaf, A. A., Alomar, A. A., Sattar, K., & Klonoff, D. C. (2020). COVID-19 pandemic: Impact of quarantine on medical students' mental wellbeing and learning behaviors. *Pakistan Journal of Medical Sciences*, *36*(COVID19-S4), S43–S48. https://doi.org/10.12669/pjms.36.COVID19-S4.2809

Mimoun, E., Ben Ari, A., & Margalit, D. (2020). Psychological aspects of employment instability during the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(S1), S183–S185. https://doi.org/10.1037/tra0000769

Moccia, L., Janiri, D., Pepe, M., Dattoli, L., Molinaro, M., De Martin, V., Chieffo, D., Janiri, L., Fiorillo, A., Sani, G., Di Nicola, M. (2020). Affective temperament, attachment style, and the psychological impact of the COVID-19 outbreak: An early report on the Italian general population. *Brain, Behavior, and Immunity*, *87*, 75–79. https://doi.org/10.1016/j.bbi.2020.04.048

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., & Prisma Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement.

PLoS Medicine, *6*(7). https://doi.org/10.1371/journal.pmed.1000097

Monteith, L. L., Holliday, R., Brown, T. L., Brenner, L. A., & Mohatt, N. V. (2020). Preventing suicide in rural communities during the COVID-19 pandemic. *The Journal of Rural Health*, *00*, 1–6. https://doi.org/10.1111/jrh.12448

Morgul, E., Bener, A., Atak, M., Akyel, S., Aktaş, S., Bhugra, D., Ventriglio, A., Jordan, T. R. (2020). COVID-19 pandemic and psychological fatigue in Turkey. *The International Journal of Social Psychiatry*, 20764020941889. https://doi.org/10.1177/0020764020941889

Naser, A. Y., Dahmash, E. Z., Al-rousan, R., Alwafi, H., Mohammad, H., Ghoul, I., Abidine, A., Bokhary, M.A., AL-Hadithi, H.T., Ali, D., Abuthawabeh, R. (2020). Mental health status of the general population, healthcare professionals, and university students during 2019 coronavirus disease outbreak in Jordan: a cross-sectional study. *MedRxiv*. https://doi.org/10.1101/2020.04.09.20056374

Nie, X. D., Wang, Q., Wang, M. N., Zhao, S., Liu, L., Zhu, Y. L., & Chen, H. (2020). Anxiety and depression and its correlates in patients with coronavirus disease 2019 in Wuhan. *International Journal of Psychiatry in Clinical Practice*, *0*(0), 1–6. https://doi.org/10.1080/13651501.2020.1791345

Olmos-Gómez, M. D. C. (2020). Sex and careers of university students in educational practices as factors of individual differences in learning environment and psychological factors during covid-19. *International Journal of Environmental Research and Public Health*, *17*(14), 1–18. https://doi.org/10.3390/ijerph17145036

Ozamiz-Etxebarria, N., Idoiaga Mondragon, N., Dosil Santamaría, M., & Picaza Gorrotxategi, M. (2020). Psychological symptoms during the two stages of lockdown in response to the COVID-19 outbreak: An investigation in a sample of citizens in Northern Spain. *Frontiers in Psychology*, *11*, 1491.

https://doi.org/10.3389/fpsyg.2020.01491

Özdin, S., & Bayrak Özdin, Ş. (2020). Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *The International Journal of Social Psychiatry*, 20764020927051. https://doi.org/10.1177/0020764020927051

Palgi, Y., Shrira, A., Ring, L., Bodner, E., Avidor, S., Bergman, Y., Cohen-Fridel, S., Keisari, S., Hoffman, Y. (2020). The loneliness pandemic: Loneliness and other concomitants of depression, anxiety and their comorbidity during the COVID-19 outbreak. *Journal of Affective Disorders*, *275*(April), 109–111. https://doi.org/10.1016/j.jad.2020.06.036

Pappa, S., Ntella, V., Giannakas, T., Giannakoulis, V. G., Papoutsi, E., & Katsaounou, P. (2020). Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. *Brain, Behavior, and Immunity*. https://doi.org/10.1016/j.bbi.2020.05.026

Park, C. L., Russell, B. S., Fendrich, M., Finkelstein-Fox, L., Hutchison, M., & Becker, J. (2020). Americans' COVID-19 stress, coping, and adherence to CDC guidelines. *Journal of General Internal Medicine*, 1–8. https://doi.org/10.1007/s11606-020-05898-9

Patel, P., Hiam, L., Sowemimo, A., Devakumar, D., & McKee, M. (2020). Ethnicity and covid-19. *The BMJ*, *369*, 1–2. https://doi.org/10.1136/bmj.m2282

Pawlak, K. M., Kral, J., Khan, R., Amin, S., Bilal, M., Lui, R. N., Sandhu, D.S., Hashim, A., Bollipo, S., Charabaty, A., de-Mandaria, E. (2020). Impact of COVID-19 on endoscopy trainees: An international survey. *Gastrointestinal Endoscopy*, *7*, 1–11. https://doi.org/10.1016/j.gie.2020.06.010

Pedrozo-Pupo, J. C., Pedrozo-Cortés, M. J., & Campo-Arias, A. (2020). Perceived stress associated with COVID-19 epidemic in Colombia: An online survey. *Cadernos de*

Saude Publica, *36*(5). https://doi.org/10.1590/0102-311X00090520

Peng, M., Mo, B., Liu, Y., Xu, M., Song, X., Liu, L., Fang, Y., Guo, T., Ye, J., Yu, Z. and Deng, Q. (2020). Prevalence, risk factors and clinical correlates of depression in quarantined population during the COVID-19 outbreak. *Journal of Affective Disorders*, *275*(July), 119–124. https://doi.org/10.1016/j.jad.2020.06.035

Pierce, M., McManus, S., Jessop, C., John, A., Hotopf, M., Ford, T., Hatch, S., Wessely, S., Abel, K. M. (2020). Says who? The significance of sampling in mental health surveys during COVID-19. *The Lancet Psychiatry*, *7*(7), 567–568. https://doi.org/10.1016/S2215-0366(20)30237-6

Ping, W., Zheng, J., Niu, X., Guo, C., Zhang, J., Yang, H., & Shi, Y. (2020). Evaluation of health-related quality of life using EQ-5D in China during the COVID-19 pandemic. *PLoS ONE*, *15*(6), 1–12. https://doi.org/10.1371/journal.pone.0234850

Public Health Agency of Canada. (2018). Key health inequalities in Canada: A national portrait – Executive Summary. https://www.canada.ca/en/public-health/services/publications/science-research-data/key-health-inequalities-canada-national-portrait-executive-summary.html

Purtle, J. (2012). Racial and ethnic disparities in post-disaster mental health: Examining the evidence through a lens of social justice. *Wash.& Lee J.Civil Rts.& Soc.Just.*, *19*(1), 31.

Purtle, J. (2020). COVID-19 and mental health equity in the United States. *Social Psychiatry and Psychiatric Epidemiology*, *55*(8), 969–971. https://doi.org/10.1007/s00127-020-01896-8

Qin, L., Li, X., Shi, J., Yu, M., Wang, K., Tao, Y., Zhou, Y., Zhou, M., Xu, S., Wu, B., Yang, Z., Zhang, C., Yue, J., Cheng, C., Liu, X., & Xie, M. (2020). Gendered effects

on inflammation reaction and outcome of COVID-19 patients in Wuhan. *Journal of Medical Virology*, 1–9. https://doi.org/10.1002/jmv.26137

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *General Psychiatry*, *33*(2), 19–21. https://doi.org/10.1136/gpsych-2020-100213

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry*, *52*, 102066. https://doi.org/10.1016/j.ajp.2020.102066

Reading, C., & Greenwood, M. (2015). Structural determinants of aboriginal peoples' health. In M. Greenwood, S. De Leeuw, N. Lindsay, & C. Reading (Eds.), *Determinants of Indigenous Peoples' Health in Canada: Beyond the Social* (pp. 1–15). Canadian Scholars Press.

Richmond, C. A. M. (2009). The social determinants of Inuit health: A focus on social support in the Canadian Arctic. *International Journal of Circumpolar Health*, *68*(5), 471–487. https://doi.org/10.3402/ijch.v68i5.17383

Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. (2020a). Psychological impact and associated factors during the initial stage of the Coronavirus (COVID-19) pandemic among the general population in Spain. *Frontiers in Psychology*, *11*, 1540. https://doi.org/10.3389/fpsyg.2020.01540

Rodríguez-Rey, R., Garrido-Hernansaiz, H., & Collado, S. (2020b). Psychological impact of COVID-19 in Spain: Early data report. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(5), 550–552. https://doi.org/10.1037/tra0000943

Rodriguez, L. M., Litt, D. M., & Stewart, S. H. (2020). Drinking to cope with the pandemic: The unique associations of COVID-19-related perceived threat and psychological distress to drinking behaviors in American men and women. *Addictive Behaviors*,

110, 106532. https://doi.org/10.1016/j.addbeh.2020.106532

Salerno, J. P., Williams, N. D., & Gattamorta, K. A. (2020). LGBTQ populations: Psychologically vulnerable communities in the COVID-19 pandemic. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(S1), S239–S242. https://doi.org/10.1037/tra0000837

Saltzman, L. Y., Hansel, T. C., & Bordnick, P. S. (2020). Loneliness, isolation, and social support factors in post-COVID-19 mental health. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(S1), S55–S57. https://doi.org/10.1037/tra0000703

Santos, G.-M., Ackerman, B., Rao, A., Wallach, S., Ayala, G., Lamontage, E., Garner, A., Holloway, I., Arreola, S., Silenzio, V., Strömdahl, S. (2020). Economic, mental health, HIV prevention and HIV treatment impacts of COVID-19 and the COVID-19 response on a global sample of cisgender gay men and other men who have sex with men. *AIDS and Behavior*, 1–11. https://doi.org/10.1007/s10461-020-02969-0

Sartorious, N. (2013). Comorbidity of mental health and physical diseases: A main challange for medicine of the 21st century. *Shangai Archives of Psychiatry*, *25*(2), 68–69. https://doi.org/10.3969/j.issn.1002-?-0829.2013.02.002

Savarino, E. V., Iovino, P., Santonicola, A., Ghisa, M., Laserra, G., Barberio, B., Maniero, D., Lorenzon, G., Ciacci, C., Savarino, V., Zingone, F. (2020). Clinical and psychological impact of COVID-19 infection in adult patients with eosinophilic gastrointestinal disorders during the SARS-CoV-2 outbreak. *Journal of Clinical Medicine*, *9*(6). https://doi.org/10.3390/jcm9062011

Schneider, J., Talamonti, D., Gibson, B., & Forshaw, M. (2020). Factors mediating the psychological well-being of healthcare workers responding to global pandemics: A systematic review. *PsyArXiv Preprints*. https://doi.org/10.31234/osf.io/c23tx

Seyahi, E., Poyraz, B. C., Sut, N., Akdogan, S., & Hamuryudan, V. (2020). The

psychological state and changes in the routine of the patients with rheumatic diseases during the coronavirus disease (COVID-19) outbreak in Turkey: A web-based cross-sectional survey. *Rheumatology International*, *40*(8), 1229–1238. https://doi.org/10.1007/s00296-020-04626-0

Shacham, M., Hamama-Raz, Y., Kolerman, R., Mijiritsky, O., Ben-Ezra, M., & Mijiritsky, E. (2020). COVID-19 factors and psychological factors associated with elevated psychological distress among dentists and dental hygienists in Israel. *International Journal of Environmental Research and Public Health*, *17*(8). https://doi.org/10.3390/ijerph17082900

Smith, L., Jacob, L., Yakkundi, A., McDermott, D., Armstrong, N. C., Barnett, Y., López-Sánchez, G.F., Martin, S., Butler, L., Tully, M. A. (2020). Correlates of symptoms of anxiety and depression and mental wellbeing associated with COVID-19: A cross-sectional study of UK-based respondents. *Psychiatry Research*, *291*, 113138. https://doi.org/10.1016/j.psychres.2020.113138

Sneed, R. S., Key, K., Bailey, S., & Johnson-Lawrence, V. (2020). Social and psychological consequences of the Covid-19 pandemic in African-American communities: Lessons from Michigan. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*(5), 446–448. https://doi.org/10.1037/tra0000881

Solomou, I., & Constantinidou, F. (2020). Prevalence and predictors of anxiety and depression symptoms during the COVID-19 pandemic and compliance with precautionary measures: Age and sex matter. *International Journal of Environmental Research and Public Health*, *17*(14). https://doi.org/10.3390/ijerph17144924

Song, X., Fu, W., Liu, X., Luo, Z., Wang, R., Zhou, N., Yan, S., Lv, C. (2020). Mental health status of medical staff in emergency departments during the Coronavirus disease 2019 epidemic in China. *Brain, Behavior, and Immunity*.

https://doi.org/10.1016/j.bbi.2020.06.002

Spoorthy, M. S. (2020). Mental health problems faced by healthcare workers due to the COVID-19 pandemic: A review. *The Lancet*, *395*(April), 1315. https://doi.org/10.1016/j.ajp.2020.102119

Stanton, R., To, Q. G., Khalesi, S., Williams, S. L., Alley, S. J., Thwaite, T. L., Fenning, A.S., Vandelanotte, C. (2020). Depression, anxiety and stress during COVID-19: associations with changes in physical cctivity, sleep, tobacco and alcohol use in Australian adults. *International Journal of Environmental Research and Public Health*, *17*(11). https://doi.org/10.3390/ijerph17114065

Subedi, R., Greenberg, T. L., & Roshanafshar, S. (2019). Does geography matter in mortality? An analysis of potentially avoidable mortality by remoteness index in Canada. *Health Reports*, *30*(5), 3–15. https://doi.org/10.25318/82-003-x201900500001-eng

Summers-Gabr, N. M. (2020). Rural-urban mental health disparities in the United States during COVID-19. *Psychological Trauma: Theory, Research, Practice and Policy*, *12*(S1), S222–S224. https://doi.org/10.1037/tra0000871

Sun, D., Yang, D., Li, Y., Zhou, J., Wang, W., Wang, Q., Lin, N., Cao, A., Wang, H., Zhang, Q. (2020). Psychological impact of 2019 novel coronavirus (2019-nCoV) outbreak in health workers in China. *Epidemiology and Infection*, *148*, e96. https://doi.org/10.1017/S0950268820001090

Taubman–Ben-Ari, O., Chasson, M., Abu Sharkia, S., & Weiss, E. (2020). Distress and anxiety associated with COVID-19 among Jewish and Arab pregnant women in Israel. *Journal of Reproductive and Infant Psychology*, *38*(3), 340–348. https://doi.org/10.1080/02646838.2020.1786037

Thomaier, L., Teoh, D., Jewett, P., Beckwith, H., Parsons, H., Yuan, J., Blaes, A.H., Lou, E.,

Hui, J.Y.C., Vogel, R. I. (2020). Emotional health concerns of oncology physicians in the United States: Fallout during the COVID-19 pandemic. *MedRxiv*, 2020.06.11.20128702. https://doi.org/10.1101/2020.06.11.20128702

Thomas, B. H., Ciliska, D., Dobbins, M., & Micucci, S. (2004). A process for systematically reviewing the literature: Providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing*, *1*(3), 176–184. https://doi.org/10.1111/j.1524-475X.2004.04006.x

Tian, F., Li, H., Tian, S., Yang, J., Shao, J., & Tian, C. (2020). Psychological symptoms of ordinary Chinese citizens based on SCL-90 during the level I emergency response to COVID-19. *Psychiatry Research*, *288*(March), 112992. https://doi.org/10.1016/j.psychres.2020.112992

Tomazin, F. (2020). 'Tsunami' of cases as coronavirus spreads where social distancing is a privilege. *Sydney Morning Herald* (April 4). https://www.smh.com.au/national/tsunami-of-cases-as-coronavirus-spreads-where-social-distancing-is-a-privilege-20200403-p54gr0.html

Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *The International Journal of Social Psychiatry*, *66*(4), 317–320. https://doi.org/10.1177/0020764020915212

Tyrrell, C. J., & Williams, K. N. (2020). The paradox of social distancing: Implications for older adults in the context of COVID-19. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*, 214–216. https://doi.org/10.1037/tra0000845

Umucu, E., & Lee, B. (2020). Examining the impact of COVID-19 on stress and coping strategies in individuals with disabilities and chronic conditions. *Rehabilitation Psychology*. https://doi.org/10.1037/rep0000328

Ustun, G. (2020). Determining depression and related factors in a society affected by COVID-19 pandemic. *The International Journal of Social Psychiatry*, 20764020938807. https://doi.org/10.1177/0020764020938807

van der Miesen, A. I. R., Raaijmakers, D., & van de Grift, T. C. (2020). "You have to wait a little longer": Transgender (mental) health at risk as a consequence of deferring gender-affirming treatments during COVID-19. *Archives of Sexual Behavior*, *49*(5), 1395–1399. https://doi.org/10.1007/s10508-020-01754-3

van Dorn, A., Cooney, R. E., & Sabin, M. L. (2020). COVID-19 exacerbating inequalities in the US. *Lancet*, *395*(10232), 1243–1244. https://dx.doi.org/10.1016%2FS0140-6736(20)30893-X

Varshney, M., Parel, J. T., Raizada, N., & Sarin, S. K. (2020). Initial psychological impact of COVID-19 and its correlates in Indian Community: An online (FEEL-COVID) survey. *PLoS ONE*, *15*(5), 1–10. https://doi.org/10.1371/journal.pone.0233874

Verma, S., & Mishra, A. (2020). Depression, anxiety, and stress and socio-demographic correlates among general Indian public during COVID-19. *The International Journal of Social Psychiatry*, 20764020934508. https://doi.org/10.1177/0020764020934508

Vinkers, C. H., van Amelsvoort, T., Bisson, J. I., Branchi, I., Cryan, J. F., Domschke, K., Howes, O. D., Manchia, M., Pinto, L., de Quervain, D., Schmidt, M. V., & van der Wee, N. J. A. (2020). Stress resilience during the coronavirus pandemic. *European Neuropsychopharmacology*, *35*, 12–16. https://doi.org/10.1016/j.euroneuro.2020.05.003

Viveiros, N., & Bonomi, A. E. (2020). Novel Coronavirus (COVID-19): Violence, reproductive rights and Related Health Risks for women, opportunities for practice innovation. *Journal of Family Violence*. https://doi.org/10.1007/s10896-020-00169-x

Walter, L. A., & McGregor, A. J. (2020). Sex- and gender-specific observations and

implications for COVID-19. *Western Journal of Emergency Medicine, 21*(3), 507–509. https://doi.org/10.5811/westjem.2020.4.47536

Wang, C., & Zhao, H. (2020). The impact of COVID-19 on anxiety in Chinese university students. *Frontiers in Psychology*, *11*, 1168. https://doi.org/10.3389/fpsyg.2020.01168

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, *17*(5). https://doi.org/10.3390/ijerph17051729

Wang, H., Xia, Q., Xiong, Z., Li, Z., Xiang, W., Yuan, Y., Liu, Y., Li, Z. (2020). The psychological distress and coping styles in the early stages of the 2019 coronavirus disease (COVID-19) epidemic in the general mainland Chinese population: A web-based survey. *PloS One*, *15*(5), e0233410. https://doi.org/10.1371/journal.pone.0233410

Wang, Y., Di, Y., Ye, J., & Wei, W. (2020). Study on the public psychological states and its related factors during the outbreak of coronavirus disease 2019 (COVID-19) in some regions of China. *Psychology, Health and Medicine*. https://doi.org/10.1080/13548506.2020.1746817

Wang, Y. X., Guo, H. T., Du, X. W., Song, W., Lu, C., & Hao, W. N. (2020). Factors associated with post-traumatic stress disorder of nurses exposed to corona virus disease 2019 in China. *Medicine, 99*(26), e20965. https://doi.org/10.1097/MD.0000000000020965

Wen, J., Aston, J., Liu, X., & Ying, T. (2020). Effects of misleading media coverage on public health crisis: A case of the 2019 novel coronavirus outbreak in China.

Anatolia, *31*(2), 331–336. https://doi.org/10.1080/13032917.2020.1730621

Wenham, C., Smith, J., & Morgan, R. (2020). COVID-19: The gendered impacts of the outbreak. *The Lancet*, *395*(10227), 846–848. https://doi.org/10.1016/S0140-6736(20)30526-2

Williams, S. L., & Mann, A. K. (2017). Sexual and gender minority health disparities as a social issue: How stigma and intergroup relations can explain and reduce health disparities. *Journal of Social Issues*, *73*(3), 450–461. https://doi.org/10.1111/josi.12225

Wilson, J. M., Lee, J., Fitzgerald, H. N., Oosterhoff, B., Sevi, B., & Shook, N. J. (2020). Job insecurity and financial concern during the COVID-19 pandemic are associated with worse mental health. *Journal of Occupational and Environmental Medicine*. https://doi.org/10.1097/JOM.0000000000001962

Wong, Y. J., Ho, M. H. R., Wang, S. Y., & Miller, I. S. K. (2017). Meta-analyses of the relationship between conformity to masculine norms and mental health-related outcomes. *Journal of Counseling Psychology*, *64*(1), 80–93. https://doi.org/10.1037/cou0000176

World Health Organization. (2020a, July 24). Coronavirus. https://www.who.int/health-topics/coronavirus#tab=tab_1

World Health Organization. (2020b, July 29). Gender. https://www.who.int/health-topics/gender

Wright, L., Steptoe, A., & Fancourt, D. (2020). Are we all in this together? Longitudinal assessment of cumulative adversities by socioeconomic position in the first 3 weeks of lockdown in the UK. *Journal of Epidemiology and Community Health*. https://doi.org/10.1136/jech-2020-214475

Wu, Y., Zhang, C., Liu, H., Duan, C., Li, C., Fan, J., Li, H., Chen, L., Xu, H., Li, X. and Guo,

Y. (2020). Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China. *American Journal of Obstetrics and Gynecology*. https://doi.org/10.1016/j.ajog.2020.05.009

Xiao, X., Zhu, X., Fu, S., Hu, Y., Li, X., & Xiao, J. (2020). Psychological impact of healthcare workers in China during COVID-19 pneumonia epidemic: A multi-center cross-sectional survey investigation. *Journal of Affective Disorders*, *274*(March), 405–410. https://doi.org/10.1016/j.jad.2020.05.081

Yao, H., Chen, J. H., & Xu, Y. F. (2020). Patients with mental health disorders in the COVID-19 epidemic. *The Lancet Psychiatry*, *7*(4), e21. https://doi.org/10.1016/S2215-0366(20)30090-0

Yin, Q., Sun, Z., Liu, T., Ni, X., Deng, X., Jia, Y., Shang, Z., Zhou, Y., Liu, W. (2020). Posttraumatic stress symptoms of health care workers during the corona virus disease 2019. *Clinical Psychology and Psychotherapy*, *27*(3), 384–395. https://doi.org/10.1002/cpp.2477

Zhang, C., Yang, L., Liu, S., Ma, S., Wang, Y., Cai, Z., Du, H., Li, R., Kang, L., Su, M., Zhang, B. (2020b). Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel Coronavirus disease outbreak. *Frontiers in Psychiatry*, *11*(April), 1–9. https://doi.org/10.3389/fpsyt.2020.00306

Zhang, S. X., Wang, Y., Rauch, A., & Wei, F. (2020). Unprecedented disruption of lives and work: Health, distress and life satisfaction of working adults in China one month into the COVID-19 outbreak. *Psychiatry Research*, *288*, 112958. https://doi.org/10.1016/j.psychres.2020.112958

Zhang, W.R., Wang, K., Yin, L., Zhao, W.F., Xue, Q., Peng, M., Min, B.Q., Tian, Q., Leng, H.X., Du, J.L. and Chang, H. (2020). Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychotherapy and*

Psychosomatics, *89*(4), 242–250. https://doi.org/10.1159/000507639

Zhou, S. J., Zhang, L. G., Wang, L. L., Guo, Z. C., Wang, J. Q., Chen, J. C., Liu, M., Chen, X., Chen, J. X. (2020). Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. *European Child and Adolescent Psychiatry*, *29*(6), 749–758. https://doi.org/10.1007/s00787-020-01541-4

Zhu, J., Sun, L., Zhang, L., Wang, H., Fan, A., Yang, B., Li, W., Xiao, S. (2020). Prevalence and influencing factors of anxiety and depression symptoms in the first-line medical staff fighting against COVID-19 in Gansu. *Frontiers in Psychiatry*, *11*(April), 1–6. https://doi.org/10.3389/fpsyt.2020.00386

Zhu, Zhen, Liu, Q., Jiang, X., Manandhar, U., Luo, Z., Zheng, X., Li, Y., Xie, J., Zhang, B. (2020). The psychological status of people affected by the COVID-19 outbreak in China. *Journal of Psychiatric Research*, *129*, 1–7. https://doi.org/10.1016/j.jpsychires.2020.05.026

Zhu, Z., Xu, S., Wang, H., Liu, Z., Wu, J., Li, G., Miao, J., Zhang, C., Yang, Y., Sun, W. and Zhu, S. (2020). COVID-19 in Wuhan: Immediate psychological impact on 5062 health workers. *MedRxiv*, (1095).

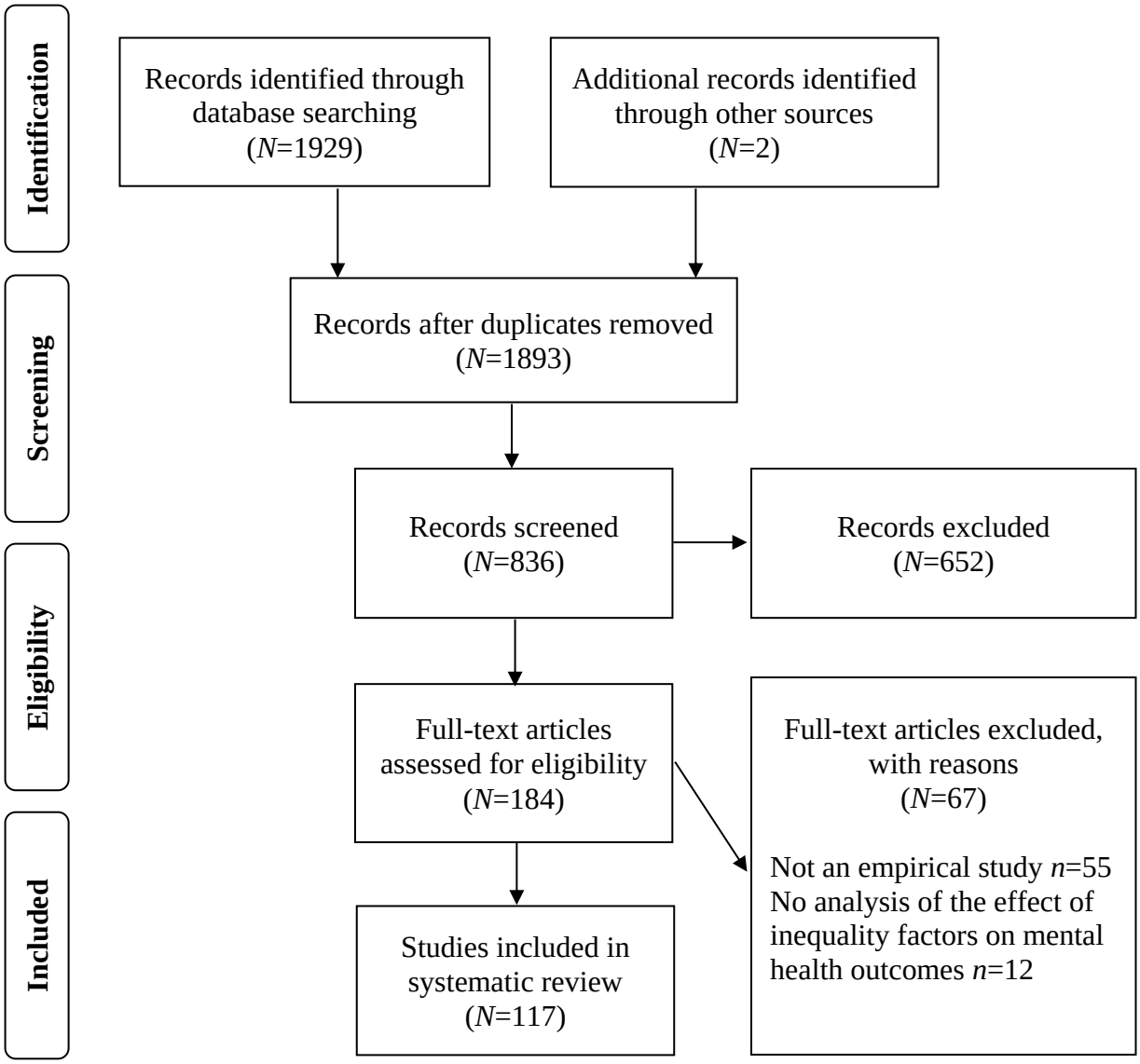

Figure 1

PRISMA Flowchart of Study Selection

Table 1

Characteristics of the Reviewed Studies

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Aafjes-van Doorn et al.	United States	Psychotherapists	339 (74%)	55.0 (16.4)	VTS	Higher trauma associated with younger age, less clinical experience, and negative online treatment experiences	3
Ahmed et al.	China	General population	1,074 (47%)	33.5 (11.1)	BAI, BDI-II, AUDIT, WEMWBS	Male sex associated with increased alcohol abuse; younger age associated with greater anxiety, depression, and lower mental well-being	3
Al Sulais et al.	Saudi Arabia	Physicians	529 (59%)	53% 30-39yrs	Understanding of quarantine rationale, quarantine behaviours, socioeconomic and psychological impact	Participants aged>60yrs experienced less isolation; women were more likely to experience fear and worry	3
Alonzi et al.	United States, Canada	Young adults	616 (48%)	26.6 (5.2)	PROMIS	Nonbinary participants reported highest depression and anxiety, followed by women and men; participants with mental and physical health conditions reported highest depression and anxiety, followed by participants with mental health conditions, physical health conditions, and no health conditions	2
Antunes et al.	Portugal	General population	1,404 (70%)	36.4 (11.7)	IPAQ, STAI, BNGS-S	Women scored higher on trait and state anxiety; adults aged 18-34yrs scored highest in trait anxiety	3
Arpacioglu et al.	Turkey	HCWs, general population	351 (62%)	32.0 (10.2)	STSS, PHQ-9	Female sex, less work experience, and history of chronic disease or trauma were related to higher stress	2
Badahdah et al.	Oman	HCWs	509 (80%)	37.7 (7.7)	GAD-7, PSS-10, WHO-5	Higher stress, anxiety, and poor psychological well-being in women and younger participants	2
Balkhi et al.	Pakistan	General population	400 (50%)	74% ≤35yrs, 26% >35yrs	Psychological impact, behavioural changes	Participants with higher education level and age>35yrs more likely to report anxiety; no effect of sex	3
Bergman et al.	Israel	Older adults	243 (69%)	69.7 (6.7)	GAD, North and Fiske's scale for ageism	Health worries and anxiety symptoms more pronounced among older adults with high ageism levels	3
Berthelot et al.	Canada	Pregnant women	Pre-pandemic 496 (100%), post-pandemic 1,258 (100%)	29.3 (4.2)	K10, PANAS, PCL-5, DES-II	History of previous psychiatric diagnosis, younger age, lower income, and lower education level associated with higher maternal psychological distress	1
Blbas et al.	Iraq	General population	894 (42%)	33.0 (10.0)	Anxiety and depression related to COVID-19	Female sex, age<30yrs, place of residence, and lower education level predicted anxiety and depression; no effect of occupation or income	2
Broche-Pérez et al.	Cuba	General population	772 (74%)	36.0 (14.6)	Fear of COVID-19	Female sex predicted middle to high levels of fear	2

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Cao et al.	China	College students	7,143 (70%)	-	Cognitions, GAD-7, preventative behaviours, social support	Urban residency and stability of family income were protective factors against anxiety; no effect of sex	2
Civantos et al.	United States	Otolaryngologists	349 (39%)	33% 31-35yrs	Burnout, IES, GAD-7, PHQ-2	Being a resident (relative to an attending) was a risk factor for burnout; female sex was a risk factor for burnout, anxiety, and distress	2
Cortes-Alvarez et al.	Mexico	General population	1,105 (62%)	69% 18-28yrs	IES-R, DASS-21	Female sex and older age associated with psychological distress, depression, anxiety, and stress	2
Costantini & Mazzotti	Italy	General population	329 (58%)	46.5 (13.6)	CPDI, IES-R	Female sex, younger age, and use of psychotropic drugs/sleeping remedies associated with high distress	2
Cotrin et al.	Brazil	Patients in active orthodontic treatment	354 (65%)	35.5 (13.9)	Anxiety, impact of pandemic and quarantine on orthodontic treatment	Anxiety higher in women than men; no effect of age	3
Dai et al.	China	HCWs	4,357 (77%)	35.0 (8.6)	Exposure to COVID-19, risk perception, GHQ-12	Female sex, working in Wuhan, and working in primary hospitals predicted psychological distress	2
Doshi et al.	India	General population	1,499 (54%)	68% 20-40yrs	Fear of COVID-19	Female sex, lower education level, and being a HCW predicted high level of fear	2
Duan et al.	China	Children and adolescents	3,613 (50%)	10% 7-12yrs, 90% 13-18yrs	SCAS, CDI, SV-SAS, IAS, CSS	Anxiety associated with age group (higher in adolescents), female sex, and urban residency; depression associated with living in Hubei	2
Durankus & Aksu	Turkey	Pregnant women	260 (100%)	29.6 (3.8)	EPDS, BDI, BAI	COVID-19 had a greater impact on the psychology, social isolation, depression, and anxiety of women who were at greater risk of postpartum depression	2
El-Zoghby et al.	Egypt	General population	510 (66%)	46% 18-30yrs	IES-R, mental health impact, impact on social and family support	Age≤30yrs, rural residency, female sex, university education (compared to post-graduate), and accompanying chronic disease predicted distress	3
Farewell et al.	United States	Pregnant and postpartum women	27 (100%)	56% 23-34yrs	PHQ-9, GAD-7, BRS, WEMWBS, loneliness	Pregnant and postpartum women were at greater risk of stress, depression, and anxiety related to COVID-19	3
Fitzpatrick et al. (2020a)	United States	General population	10,368 (51%)	47.4 (17.7)	SBQ-R, CES-D	Participants who were younger, Black, Native American, or Hispanic were at greater risk of suicide behaviours	2
Fitzpatrick et al. (2020b)	United States	General population	10,368 (51%)	47.4 (17.7)	CES-D, stress-related factors	Women, Hispanic participants, and participants who were not working showed elevated depression	2
Fitzpatrick et al. (2020c)	United States	General population	10,368 (51%)	47.4 (17.7)	COVID-19 fear, GAD-7, CES-D	Female sex and being Asian, Hispanic, or foreign-born were associated with fear, anxiety, and depression	2
Flentje et al.	United States	Sexual and gender minority individuals	2,288 (63%)	36.9 (14.7)	PHQ-9, GAD-7	COVID-19 increased anxiety and depression in those who did not have pre-existing symptoms consistent with generalised anxiety or depression	2
Fu et al.	China	General population	1,242 (70%)	73% ≤30, 27% >30	PHQ-9, GAD-7, AIS, SCSQ	Female sex, higher income, and higher education level predicted anxiety, depression, and sleep disorder	2

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Gao, Sun et al.	China	Patients with emotional disorders	570 (61%)	38.6 (13.9)	COVID-19 impact and beliefs	Male sex, older age, and lower education level associated with more negative beliefs about the pandemic	2
Gao, Zheng et al.	China	General population	4,872 (68%)	32.3 (10.0)	WHO-5, GAD-7, social media exposure	Age 31-40yrs, lower education level, urban residency, and lower self-rated health were risk factors for depression; no effect of sex	2
Gómez-Salgado et al.	Spain	General population	4,180 (74%)	40.3 (13.2)	COVID-19 symptoms, GHQ-12	Female sex and number of symptoms presented predicted psychological distress	2
González-Sanguino et al.	Spain	General population	3,480 (75%)	37.9 (-)	PHQ-2, GAD-2, PCL-C-2, loneliness, belonging, discrimination, social support, spiritual well-being, self-compassion	Younger age and female sex related to poorer mental health outcomes	2
Gualano et al.	Italy	General population	1,515 (66%)	*Mdn* (IQR) 42 (23yrs)	PHQ-9, GAD-2, ISI	Female sex, accompanying chronic disease, and younger age increased likelihood of poor mental health outcomes and sleep disturbances	2
Guo et al.	China	COVID-19 patients and controls	Patients 103 (43%), controls 103 (48%)	Patients 42.5 (12.5), controls 41.4 (13.1)	PHQ-9, GAD-7, PSS-10, PCL-5	COVID-19 patients manifested higher depression, anxiety, and post-traumatic stress; women in both groups showed greater perceived helplessness	2
Hao, Tan et al.	China	Psychiatric patients	Patients 76 (37%), controls 109 (62%)	Patients 32.8 (11.8), controls 33.1 (11.2)	IES-R, DASS-21, ISI	Psychiatric patients had more health concerns, impulsivity, suicidal ideation, and reported higher anxiety, depression, stress, and insomnia	3
Hao, Zhou et al.	China	Patients with epilepsy	Patients 252 (52%), controls 252 (52%)	Patients 29.3 (11.6), controls 29.4 (11.5)	Clinical health data, K6	Patients with epilepsy reported higher psychological distress than healthy controls; diagnosis of drug-resistant epilepsy and time spent following media reports of the outbreak associated with severe psychological distress	1
Horesh et al.	Israel	General population	204 (71%)	45.9 (19.7)	PSS, BAI, WHOQOL	Female sex, younger age, lower income, and accompanying chronic disease were related to higher psychological distress and lower quality of life	2
Huang et al.	China	HCWs	587 (52%)	*Mdn* (IQR) 33 (28-43yrs)	CD-RISC, PSS	Perceived stress (inverse), female sex (inverse), knowledge of COVID-19 and protective measures, and availability of adequate PPE predicted resilience; no effect of age, education level, or work experience	2
Huang & Zhao	China	General population	7,236 (55%)	35.3 (5.6)	GAD-7, CES-D, PSQI, knowledge of outbreak	Age<35yrs predicted anxiety and depression; being a HCW predicted poor sleep quality; no effect of sex	2
Iob et al.	United Kingdom	General population	44,775 (51%)	32% >60yrs	PHQ-9	Abuse, self-harm, and thoughts of suicide/self-harm higher in women, BAME participants, and people experiencing socioeconomic disadvantage,	1

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
						unemployment, disability, accompanying chronic disease, mental disorders, and COVID-19 diagnosis	
Jahrami et al.	Bahrain	HCWs	257 (70%)	40.2 (9.7)	PSS, PSQI	Female sex and being a physician or nurse predicted poor sleep quality and moderate to severe stress	2
Jiang et al.	China	General population	6,049 (75%)	Range 17-63yrs	PCL-5, ERQ	Lower education level, female sex, and younger age predicted moderate to severe PTSS	2
Karatzias et al.	Ireland	General population	1,041 (52%)	21% 55-64yrs	ITQ, PHQ-9, GAD-7	Younger age, male sex, urban residency, and screening positive for anxiety/depression increased PTSD	2
Kavčič et al.	Slovenia	General population	2,722 (75%)	36.4 (13.1)	CD-RISC-10, PSS, MHC-SF	Female sex, younger age, and lower education level increased odds for worse psychological functioning	2
Khanna et al.	India	Ophthalmologists	2,355 (43%)	42.5 (12.1)	Impact of COVID-19 on work and income, PHQ-9	Depression higher in younger individuals, women, those not in practice, and ophthalmologists-in-training; depression related to concern about training and profession and ability to meet living expenses	2
Kimhi et al.	Israel	General population	Jewish 605 (49%), Arab 156 (50%)	Jewish 42.4 (15.6), Arab 36.0 (13.6)	Resilience, sense of danger, feeling safe at home, BSI, well-being	Israeli Arabs reported higher distress and lower resilience and well-being; higher education level predicted anxiety among Jewish participants, but negatively predicted anxiety among Arab participants	2
Kokou-Kpolou et al.	France	General population	556 (76%)	30.1 (-)	ISI, loneliness	Lower education level, pre-existing mental health illness, and loneliness increased likelihood of being diagnosed with clinical insomnia; no effect of sex	2
Lai et al.	China	HCWs	1,257 (77%)	65% 26-40yrs	PHQ-9, GAD-7, ISI, IES-R	Nurses, women, frontline workers, and those in Wuhan reported more depression, anxiety, insomnia, and distress	2
Lei et al.	China	General population	1,593 (61%)	32.3 (9.8)	SAS, SDS	Female sex, lower average household income, lower education level, having a higher self-evaluated level of knowledge, greater economic loss, and lower self-perceived health associated with anxiety and depression	2
Li & Wang	United Kingdom	General population	15,530 (-)	-	GHQ-12, loneliness	Female sex and younger age were risk factors for psychiatric disorders and loneliness; having a job was a protective factor	2
Liang, Gao et al.	China	Young adults	570 (64%)	73% 21-30yrs	PCL-C, GHQ-12, SCSQ	Sex moderated the direct effect between psychological distress and PTSD; men experienced higher PTSD with increasing psychological distress	3
Liang, Ren et al.	China	Young adults	584 (62%)	75% 21-30yrs	GHQ-12, PCL-C, SCSQ	Lower education level predicted worse mental health and higher PTSD	2
Lin, Hu et al.	China	General population	2,446 (70%)	68% 18-24yrs	Knowledge, attitudes, impact, STAI	Younger age, female sex, suburban/rural residency, lower income, and high perceived susceptibility, severity, and impact predicted state and/or trait anxiety	2
Lin, Wang et al.	China	General population	5,461 (70%)	71% 45-60yrs	ISI, PHQ-9, GAD-7, ASDS	Female sex and younger age associated with insomnia	3

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Liu, Chen et al.	China	Pregnant women	1,947 (100%)	89% <35yrs, 11% ≥35yrs	SAS	Living in the epidemic hardest hit area and coming from extremely high- or low-income families predicted anxiety	2
Liu, Luo et al.	China	General population	608 (59%)	53% 19-39yrs	STAI, SDS, SCL-90	Younger age predicted state anxiety, depression, and psychological abnormalities	2
Liu, Yang et al.	China	HCWs	512 (85%)	75% 18-39yrs	SAS	No effect of sex, age, education level, or geographical location on anxiety	2
Liu, Zhang, Wei et al.	China	General population	285 (54%)	48% ≤35yrs, 52% >35yrs	PCL-5, PSQI	Female sex and poor sleep quality predicted PTSS; no effect of age or education level	2
Liu, Zhang, Wong et al.	United States	Young adults	898 (81%)	24.5 (-)	CD-RISC-10, DTS, MSPSS, TWSSS, loneliness, PHQ-9, GAD-7, PCL-C	Asian American and Hispanic/Latinx participants reported less psychological distress than White participants; transgender participants more likely to report higher PTSD; no effect of age, sex, or income	2
Liu, Zhu et al.	China	Medical students	217 (59%)	21.7 (1.7)	PHQ-9, GAD-7	No effect of sex, geographical location, or grade on anxiety or depression	3
Ma, Li et al.	China	COVID-19 patients	770 (52%)	50.4 (13.1)	PHQ-9, WHOQOL_BRIEF	Male sex was a protective factor against depression	2
Ma, Zhang et al.	China	General population	728 (70%)	32.9 (10.4)	IES, Impact of COVID-19 on family and social support, MHLSS	Female sex associated with higher psychological distress; men reported increased work stress and women reported increased financial stress and stress at home	2
Maarefvand et al.	Iran	General population	3,787 (67%)	34.9 (-)	Medical history, stress, COVID-19 knowledge	Female sex, younger age, and accompanying chronic disease predicted higher stress score	2
Maguire & O'Shea	Ireland	Patients with IA	80 (38%)	50.7 (-)	PHQ-4, social interaction	Female sex associated with greater decline in general health, mood disturbance, and increased disease activity	2
Mappa et al.	Italy	Pregnant women	178 (100%)	*Mdn* (IQR) 33 (30-36yrs)	STAI, concerns about perinatal complications	Higher education level associated with state anxiety; no effect of age or employment status	3
Mazza et al.	Italy	General population	2,766 (72%)	32.9 (13.2)	DASS-21, PID-5-BF	Lower education level, female sex, unemployment, young age, having to go out to work, and a history of stressful situations/medical problems associated with depression, anxiety, and stress	2
Meo et al.	Pakistan	Medical students	530 (55%)	Women 21.2 (1.6), men 22.6 (1.6)	Psychological well-being, stress, learning behaviours	Both female and male medical students reported to be emotionally detached from their social support system, and a decrease in overall work performance	3
Mimoun et al.	Israel	General population	293 (64%)	44.6 (16.7)	BIPQ-R, DTPS, PSS	Participants on furlough reported higher distress compared to unemployed and full-time workers; among full-time workers and unemployed, older age was associated with lower stress	3
Moccia et al.	Italy	General population	500 (60%)	26% 28-37yrs	K10, affective temperament, attachment style	Male sex was a protective factor for psychological distress; no effect of education level, occupation, history of chronic disease, or geographical location	2

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Morgul et al.	Turkey	General population	3,672 (36%)	<30 to >60yrs	COVID-19 knowledge, FAS	Age<30yrs and >50yrs, lower education level, occupation, and suburban residency predicted fatigue; no effect of sex	2
Naser et al.	Jordan	General population, university students, HCWs	4,126 (59%)	55% 18-29yrs	PHQ-9, GAD-7	HCWs: Female sex, working as a pulmonologist, being older (inverse), and higher income (inverse) predicted depression and anxiety; Students: Female sex, history of chronic disease, and higher income predicted depression and anxiety; General population: Female sex, being older (inverse), higher income (inverse), and being retired (inverse) predicted depression and anxiety	2
Nie et al.	China	COVID-19 patients	78 (55%)	58.4 (13.0)	SDS, SAS	Female sex predicted higher depression severity	2
Olmos-Gómez	Spain	University students and staff	441 (66%)	22.7 (3.7)	Sleep, emotions, physical disorders, anxiety	Female students reported more problematic psychological factors	2
Ozamiz-Etxebarria et al.	Spain	General population	1,933 (80%)	33.8 (16.7)	DASS-21	Male sex, younger age, and accompanying chronic disease associated with higher anxiety and depression	2
Özdin & Bayrak Özdin	Turkey	General population	343 (49%)	37.2 (10.3)	HADS, HAI	Urban residency, female sex, accompanying chronic disease, and previous psychiatric illness predicted depression, anxiety, and health anxiety	2
Palgi et al.	Israel	General population	1,059 (75%)	46.2 (16.5)	PHQ-9, GAD-7	Younger age and lower education level were related to more symptoms of depression; adults aged>60yrs displayed greater resilience to depression and anxiety	2
Park et al.	United States	General population	1,015 (54%)	38.9 (13.5)	Stressors, guidelines adherence, coping	Participants with fewer resources/experiencing financial strain, younger age, female sex, ethnics and sexual minority status, and caregivers reported more stressors and higher overall stress	3
Pawlak et al.	63 countries	Endoscopy trainees	770 (44%)	32.6 (-)	GAD-7	Female sex was a risk factor for anxiety	2
Pedrozo-Pupo et al.	Colombia	General population	406 (62%)	43.9 (12.4)	PSS-10 (modified for COVID-19)	No effect of sex, age, education level, socioeconomic status, or accompanying chronic disease	2
Peng et al.	China	Quarantined individuals	2,237 (40%)	Depression 35.0 (9.9), no depression 36.9 (5.1)	SDS, PSQI, IER-R, PTSS	Younger age and lower education level predicted depression; no effect of sex	2
Ping et al.	China	General population	1,139 (60%)	38.3 (12.5)	Health status, worry, HRQOL	Accompanying chronic disease and lower family income associated with anxiety and depression; no effect of sex	2
Qiu et al.	China	General population	52,730 (65%)	-	CPDI	Female sex, age 18-30yrs and >60yrs, higher education level, and being a migrant worker predicted distress	2
Rodriguez et al.	United States	General population	754 (50%)	41.7 (10.4)	PCTQ, QF	No effect of sex on link between psychological distress and drinking	2

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Rodríguez-Rey et al. (2020a)	Spain	General population	3,055 (75%)	32.2 (13.0)	IES-R	Younger age and female sex predicted psychological distress	2
Rodríguez-Rey et al. (2020b)	Spain	General population	3,055 (75%)	32.2 (13.0)	IES-R, DASS-21	Women, younger participants, and those who lost their job during the pandemic showed strongest negative psychological symptoms	2
Santos et al.	103 countries	Cisgender gay men and other men who have sex with men	2,732 (0%)	-	Economic impact of COVID-19, HIV treatment and care impact, PHQ-4	31% reported moderate to severe psychological distress, 35% reported depression, 34% reported anxiety; individuals who lost employment more likely to report anxiety and depression	2
Savarino et al.	Italy	Patients with EGIDs	102 (37%)	35.5 (11.8)	Clinical and psychological impact of COVID-19	Female sex and lower education level associated with higher psychological perception of COVID-19	3
Seyahi et al.	Turkey	Patients with rheumatic diseases, HCWs, high-school teachers/academic staff	Patients 771 (68%), HCWs 535 (66%), teachers 917 (72%)	Patients 16-81 (*Mdn*=42yrs), HCWs 19-58 (*Mdn*=31yrs), teachers 21-79 (*Mdn*=35yrs)	HADS, IES-R	Female sex, working in a hospital, lower education level, and having a comorbid disease or a psychiatric disorder were associated with psychiatric symptoms	3
Shacham et al.	Israel	Dentists and dental hygienists	338 (59%)	46.4 (11.2)	Fear of contracting COVID-19, subjective overload, GSES, K6	Background illness, subjective overload, and self-efficacy (inverse) predicted psychological distress	2
Smith et al.	United Kingdom	General population	932 (63%)	21% 25-34yrs	Health questionnaire (smoking status, alcohol use, and multi-morbidity), BAI, BDI, WEMWBS	Female sex, younger age, lower income, smoker status, and physical multimorbidity associated with poor mental health	2
Solomou & Constantinidou	Cyprus	General population	1,642 (72%)	42% 18-29yrs	Compliance with precautionary measures, quality of life, GAD-7, PHQ-9	Women, younger adults, unemployed, participants with poor psychiatric history, and those reporting greater impact on quality of life were at greater risk for increased anxiety and depression	2
Song et al.	China	HCWs	14,825 (64%)	34.0 (8.2)	PSSS, CES-D, PCL-5	Male sex, working in Hubei, middle age, less work experience, longer daily work hours, lower social support, and being a nurse were risk factors for depression and PTSD	2
Stanton et al.	Australia	General population	1,491 (67%)	50.5 (14.9)	DASS-21, physical activity, sleep, smoking behaviour, alcohol use	Female sex, lower income, age 18-45yrs, and accompanying chronic disease associated with higher psychological distress	2
Sun et al.	China	HCWs	442 (83%)	59% 26-35yrs	COVID-19 impact, IES	Female sex predicted higher arousal; being quarantined predicted higher psychological distress	2
Taubman–Ben-ari et al.	Israel	Pregnant women	336 (100%)	30.3 (5.0)	COVID-19 related anxiety, MHI-5	Arab women reported higher COVID-19 related anxiety and distress than Jewish women	3

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Thomaier et al.	United States	Oncology providers	374 (63%)	45.7 (9.6)	PHQ-4, COVID-19 concerns, effects on decision making and practice, well-being	Female sex, younger age, less experience, practicing in a state with more cases, inadequate PPE, and feeling that COVID-19 was interfering with job and care provision associated with anxiety and depression	2
Tian et al.	China	General population	1,060 (48%)	35.0 (12.8)	SCL-90	Enterprise staff/agricultural workers, aged>50 or <18yrs, and women more likely to be in high-risk group	2
Umucu & Lee	United States	Individuals with self-reported disabilities and chronic conditions	269 (44%)	39.4 (12.2)	PSQ-8, coping, well-being, PHQ-4	No effect of age, sex, or ethnicity	2
Ustun	Turkey	General population	1,115 (72%)	28.0 (8.8)	Personal information form, BDI	Female sex, student status, age 18-29yrs, and lower income associated with higher depression; no effect of accompanying chronic disease	2
Varshney et al.	India	General population	653 (25%)	41.8 (13.6)	IES-R	Younger age, female sex, and comorbid physical illness predicted higher psychological impact	2
Verma & Mishra	India	General population	354 (48%)	54% 18-25yrs	DASS-21, binge drinking/substance abuse	Employment, binge drinking, and male sex associated with depression, anxiety, and stress	2
Wang, Di et al.	China	General population	600 (56%)	34.0 (12.0)	SAS, SDS	Female sex and age<41yrs were risk factors for anxiety; higher education level and working as a professional were risk factors for depression	2
Wang, Pan et al.	China	General population	1,210 (67%)	53% 21-31yrs	IES-R, DASS-21	Female sex, student status, physical symptoms, and poor self-rated health status were associated with greater psychological impact, stress, anxiety, and depression	2
Wang, Xia et al.	China	General population	1,599 (67%)	33.9 (12.3)	K6, SCSQ	Younger age associated with higher psychological distress; no effect of sex	2
Wang, Guo et al.	China	Nurses	202 (88%)	32.0 (-)	PCL-C, SCSQ	Low job satisfaction and female sex associated with higher PTSD	2
Wang & Zhao	China	University students	3611 (59%)	-	SAS	Female students reported higher anxiety than male students	3
Wilson et al.	United States	General population	474 (46%)	19-85 (*Mdn*=40yrs)	GAD-7, PHQ-9, job insecurity, financial concern, perceived health, illness recency	Job insecurity directly related to greater depression and indirectly related to greater anxiety due to higher financial concern	2
Wu et al.	China	Pregnant women	Pre-pandemic 2,839 (100%), post-pandemic 1,285 (100%)	27-32 (*Mdn*=30yrs)	EPDS, pregnancy-related health issues	Pregnant women who were underweight before pregnancy, primiparous, <35yrs, employed full time, in the middle-income category, and had appropriate living space were at increased risk for anxiety and depression	2
Xiao et al.	China	HCWs	958 (67%)	-	PSS-14, HADS	Female sex, intermediate (compared to junior) title, deficient PPE, and contact with diagnosed patients were risk factors for anxiety and depression	2

Author(s)	Country	Participants	*N* (% Female)	Age in Years[a]	Measures	The Impact of Inequality Factors on Mental Health	Study Quality[b]
Yin et al.	China	HCWs	371 (62%)	35.3 (9.5)	Exposure to COVID-19 patients, PCL-5, PSQI	Female HCWs more vulnerable to PTSS than male HCWs	2
Zhang, Wang et al.	China	HCWs	2,182 (64%)	96% 18-60yrs	ISI, SCL-90-R, PHQ-2, GAD-2	Medical HCWs: Female sex, rural residency, exposure to COVID-19 patients, and organic diseases were risk factors for psychological symptoms; Non-medical HCWs: Organic diseases was a risk factor for psychological symptoms	2
Zhang, Yang et al.	China	HCWs	1,563 (83%)	32% 31-40yrs	ISI, PHQ-9, GAD-7, IES-R	Insomnia associated with female sex, lower education level, being a doctor, and working in isolation unit	2
Zhang, Wang, Rauch, & Wei	China	General population	369 (45%)	36.6 (10.5)	SF-12, K6, work status, exercise	Those who stopped working reported worse mental and physical health outcomes and greater distress; severity of distress higher in individuals with existing health issues	2
Zhou, Zhang et al.	China	High school students	8,079 (54%)	12-18 (*Mdn*=16yrs)	PHQ-9, GAD-7	Female sex, living in Hubei, and being in the higher grade were risk factors for anxiety and depression	2
Zhu, Sun et al.	China	HCWs	165 (83%)	34.2 (8.1)	SAS, SDS, SCSQ	History of depression/anxiety was risk factor for anxiety and depression; male sex was protective for depression	2
Zhu, Xu et al.	China	HCWs	5,062 (85%)	56% 30-49yrs	COVID-19 threat perception, IES-R, PHQ-9, GAD-7	PPE (inverse), female sex, drinking history, reasonable work shifts (inverse), work experience>10yrs, exercise habit (inverse), accompanying chronic disease, and history of mental disorders predicted stress, depression, and anxiety	2
Zhu, Liu et al.	China	HCWs, general population	922 (56%)	36% 36-39yrs	SCL-90	Medical staff reported greater mental health symptoms; women had a higher risk for mental health symptoms	2

Note. Only outcomes directly related to inequality and mental health are presented. *Abbreviations. Measures:* AIS = Athens Insomnia Scale; ASDS = Acute Stress Disorder Scale; AUDIT = Alcohol Use Disorder Identification Test; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; BIPQ = Brief Illness Perception Questionnaire; BNGS-S = Basic Need General Satisfaction Scale; BRS = Brief Resilience Scale; BSI = Brief Symptom Inventory; CDI = Child Depression Inventory; CD-RISC = Connor-Davidson Resilience Scale; CES-D = Center for Epidemiology Scale for Depression; CPDI = COVID-19 Peritraumatic Distress Index; CSS = Coping Style Scale; DASS-21 = Depression, Anxiety, and Stress Scale; DES-II = Dissociative Experiences Scale; DTPS = Distress Thermometer and Problem List; DTS = Distress Tolerance Scale; EPDS = Edinburgh Postnatal Depression Scale; ERQ = Emotion Regulation Questionnaire; FAS = Fatigue Assessment Scale; GAD = Generalized Anxiety

Disorder Scale; GHQ = General Health Questionnaire; GSES = General Self-Efficacy Scale; HADS = Hospital Anxiety and Depression Scale; HAI = Health Anxiety Inventory; IAS = Internet Addiction Scale; IES = Impact of Events Scale; IPAQ = International Physical Activity Questionnaire; ISI = Insomnia Severity Index; ITQ = International Trauma Questionnaire; K6/10 = Kessler Psychological Distress Scale; MHC = Mental Health Continuum; MHI = Mental Health Inventory; MHLSS = Mental Health Lifestyle Scale; MSPSS = Multidimensional Scale of Perceived Social Support; PANAS = Positive And Negative Affect Schedule; PCL = PTSD Checklist; PCTQ = Perceived Coronavirus Threat Questionnaire; PHQ = Patient Health Questionnaire; PID = Personality Inventory for DSM-5; PROMIS = Patient-Reported Outcomes Information System; PSQ = Perceived Stress Questionnaire; PSQI = Pittsburgh Sleep Quality Index; PSS = Perceived Stress Scale; PSSS = Perceived Social Support Scale; QF = Quantity/Frequency/Peak Alcohol Use Index; SAS = Self-rating Anxiety Scale; SBQ = Suicide Behaviour Questionnaire; SCAS = Spence Child Anxiety Scale; SCL-90 = Symptom Checklist-90; SCSQ = Simplified Coping Style Questionnaire; SDS = Self-rating Depression Scale; SF-12 = Short Form-12; STSS = Secondary Traumatic Stress Scale; WEMWBS = Warwick-Edinburgh Mental Well-Being Scale; STAI = State-Trait Anxiety Inventory; SV-SAS = Short Version of the Smartphone Addiction Scale; TWSSS = Two-Way Social Support Scale; VTS = Vicarious Trauma Survey; WHO-5 = WHO-Five Well-Being Index; WHOQOL = WHO Quality of Life Scale. *Mental health outcomes:* HRQOL = Health-related quality of life; PTSS = Post-traumatic stress symptoms; PTSD = Post-traumatic stress disorder. *Other:* BAME = Black, Asian, and Minority Ethnic; EGID = Eosinophilic Gastrointestinal Disease; HCW = Healthcare worker; IA = Inflammatory Arthritis; PPE = Personal protective equipment.

[a]Age presented as mean years (standard deviation) unless otherwise specified.

[b]Study quality was assessed according to the EPHPP guidelines as follows: 1 = strong, 2 = moderate, 3 = weak.

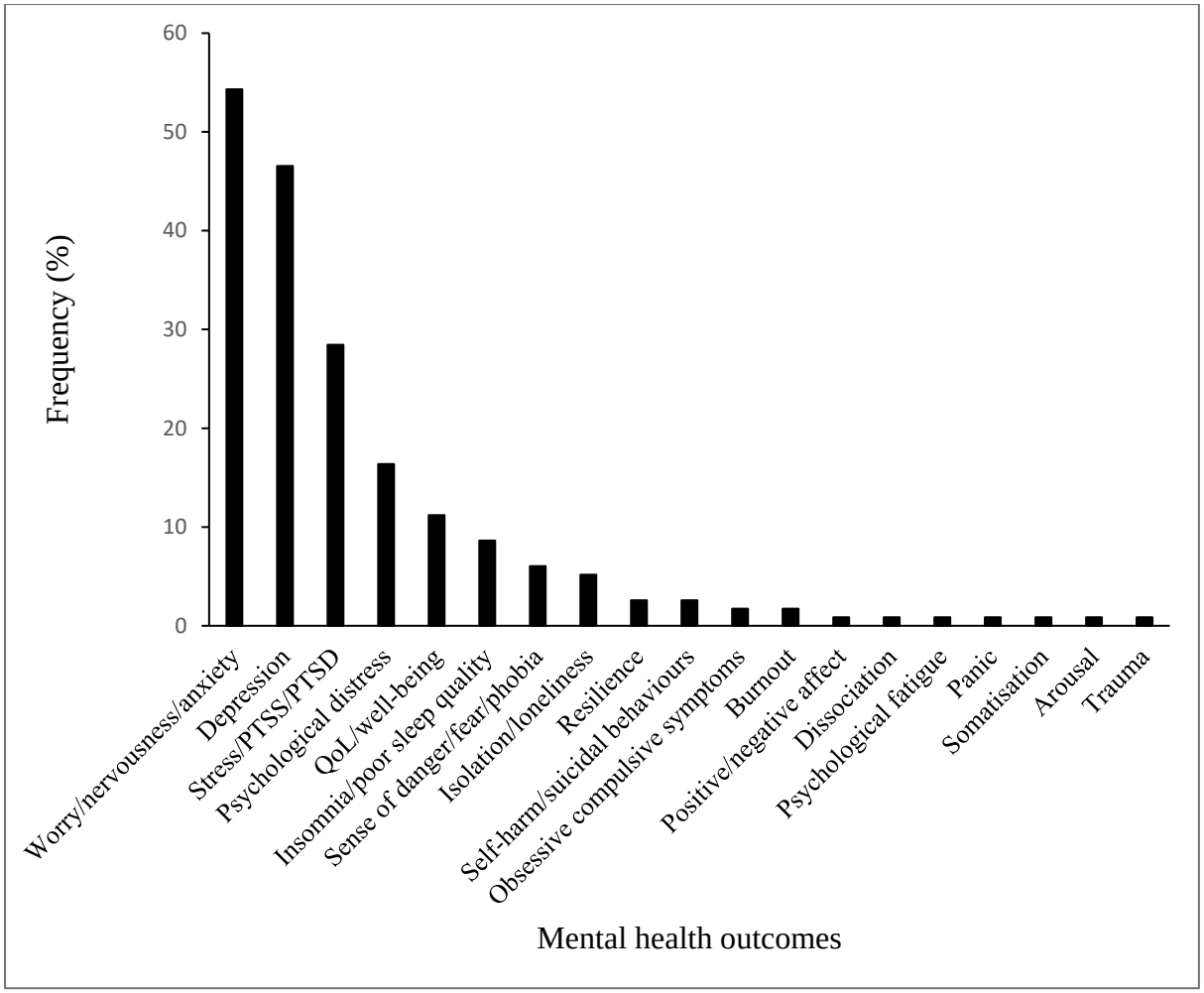

Figure 2

Frequency of Assessed Mental Health Factors During the COVID-19 Pandemic in the Reviewed Studies

Note. PTSD = Post-traumatic stress disorder; PTSS = Post-traumatic stress symptoms; QoL = Quality of life.

Box 1: Recommendations to Mitigate Adverse Mental Health Outcomes in Vulnerable Populations During COVID-19 (ASSIST)

A – Acknowledge inequality! This pandemic has highlighted how quickly many people become vulnerable because of existing inequalities. We must commit to ensure a fair society for all and not just during times of crisis. COVID-19 is a lesson to us all about what happens when we create an unfair society, so in the future (but starting now) we should lift up vulnerable members of society so that we really *are* all in this together. We should make sure that minoritized, racialised, and otherwise marginalised groups are listened to and included in national health campaigns while also tackling prejudices that block access to care and incite hatred and mistreatment towards them. Mental health service providers should be aware of inequality factors that may impact their clients' mental health and provide individualised treatments tailored to the client's needs. Clinicians should also check in on their clients more frequently, as the situation is still developing and may change rapidly from day to day. It is the job of policy makers and politicians, meanwhile, to make sure that funding is available for these services. Researchers should also be sensitive to risk factors when developing interventions, so that interventions can be tailored to vulnerable populations. Importantly, researchers should do more to select participant samples that are inclusive of vulnerable populations, particularly those that are at high risk of adverse mental health outcomes and less likely to take part in research, such as older participants or individuals with long-term health conditions. After all, more research is required on the mental health of marginalised and disadvantaged people during COVID-19.

S – Support women! It's important that we challenge gender expectations and encourage men to take up their share of care and household duties. Take care to frame this in a way that men do not feel overburdened themselves, but so that they *want* to support the women in their lives. More efforts are required to support women at risk of domestic violence through the setting up of online services, providing safe spaces for women that take social distance and COVID-19-related health precautions into account, and creating networks for monitoring women living with partners with a history of abuse. Researchers investigating the effect of sex on mental health outcomes should consider the intersectionality (i.e., the connected nature) between sex and gender and take into account additional factors that may mediate or moderate this effect.

S – Support workers! Make sure people feel both safe while at work and also secure in their jobs. Support from the government is important here, and efforts to control rent and mortgage repayments might help people feel more financially secure should they be furloughed or lose their job. People working frontline or high-risk jobs (e.g., healthcare workers and essential workers) should be protected and offered sick pay and leniency with work. More research is required in non-healthcare workers as well as students who may also be at an increased risk for poor mental health outcomes during COVID-19.

I – Improve messaging! Make COVID-19 information accessible for everyone (e.g., not dependent on access to the internet) and easy to follow. For example, the British Psychological Society have made documents available to the public and are encouraging health communicators to utilise the COM-B model to promote behaviour change (according to the model, people must feel they have the Capability, Opportunity, and Motivation in order to make changes to their Behaviour; good messaging will encourage these three feelings). Researchers communicating findings should consider distinguishing participants based on more than one inequality factor (e.g., Black men, Black women, White men, White women) and make findings accessible online and offline to different communities. Messaging can also help vulnerable populations feel more included and empowered.

S – Support for those with existing physical and mental health conditions! People with existing health needs are already vulnerable but especially unlikely to be getting the support they need at this time, which may be putting them at further risk of distress. For participants with reduced access to healthcare services (e.g., due to rural residency, chronic conditions, increased risk of COVID-19-related morbidity and mortality, or lower disposable income), alternative provision of mental health services should be considered. Telehealth could be a useful strategy to make sure people can still get the mental health support they need, while staying safe during the pandemic. Increased resources are also required so that health services that treat existing conditions can continue as best as they can.

T – Privacy from Track and Tracing systems! Consider and protect the needs for privacy for those who feel vulnerable including migrants, people from different ethnic backgrounds, and those from the LGBTQ+ community. Transparent messaging (about how information is stored/protected/etc.) that people can trust is vital.

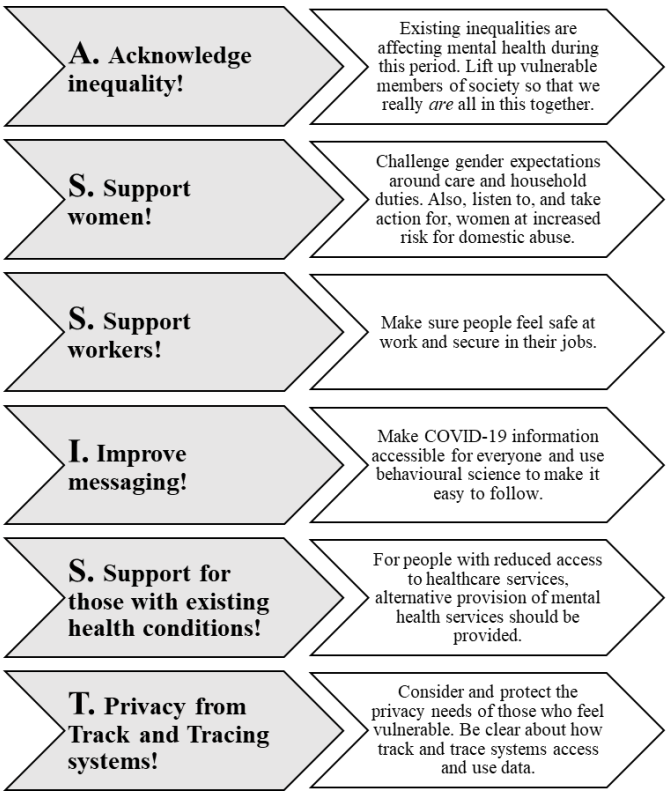

Figure 3

The 'ASSIST' Diagram