

# **The prevalence of psychological consequences of COVID-19: a systematic review and meta-analysis of observational studies**

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## **Abstract**

A systematic review and a meta-analysis were conducted to examine the overall prevalence of psychological health outcomes during COVID-19. Seven databases were systematically searched to include studies reporting on at least one psychological outcome. The pooled prevalence of primary psychological outcomes was 26% (95%CI: 21-32). Pooled prevalence for symptoms of PTSD was 33% (0-86), anxiety 28% (21-36), stress 27% (14-43), and depression 22% (13-33). The prevalence of psychological outcomes was similar in healthcare workers and in the general population (34% [24-44] and 33% [27-40] respectively). High prevalence figures support the importance of ensuring adequate provision of resources for mental health.

**Keywords:** COVID-19, mental health, psychiatry, pandemic, meta-analysis, systematic review

## **Introduction**

Since the initial outbreak in Wuhan, and subsequent spread to other parts of China in January 2020, COVID-19 has rapidly diffused through the World becoming a pandemic (Wu et al., 2020). Most countries have progressively implemented various forms of lockdown and mass quarantines resulting in global restrictions, profoundly affecting social and occupational functioning. Uncertainty about the future, due to the increasing number of COVID fatalities, the economic downturn, the breaking down of routine health care provision, unemployment, and limitations to personal freedom, has infused a widespread sense of precarity. Older generations, at risk of infection due to pre-existing vulnerabilities, have become the centre of an ethical debate aiming at deciding whether younger generations should be preferred, in view of limited healthcare resources (Archard and Caplan, 2020). Frontline healthcare workers (HCWs) have been exposed to the absence of protective equipment (Horton, 2020), whereas intense media reporting has fostered an atmosphere of anticipation and social anxiety (Sell et al., 2017). Recently, Holmes and colleagues have made an urgent call for a systematic and strategic approach for research priorities to better serve the mental health needs of COVID-19 affected individuals and the likely psychological consequences of the pandemic for the general population (Holmes et al., 2020). In this systematic review and meta-analysis, we address the fundamental first question by establishing the prevalence of a wide range of psychological outcomes originating from the global COVID-19 pandemic. The work systematically evaluates the prevalence of psychological consequences of those inflicted or suspected of COVID-19, HCWs, as well as the general population. We specifically assessed these three populations given that the reasons for psychological strain are likely to be driven by different factors. For example, the former group are most likely to fear death and experience feelings of hopelessness and panic from contracting the virus. HCWs are at high risk of depressive symptoms and fear of infection, particularly if there is an inadequate supply or limited access to personal protective

equipment (PPE) (Lam et al., 2020). Conversely, the general population is more likely to suffer psychological consequences as a result of government-led restrictions such as social isolation and social distancing measures. There are currently two recent systematic reviews and meta-analyses in this area. The first specifically focused on the psychological impact of COVID-19 amongst HCWs (Pappa et al., 2020). The second considered HCWs as well as the general population which also included patients (Luo et al., 2020). However, it is important to note that the primary focus of these were anxiety, depression and/or insomnia. Unlike the aforementioned studies, our work collectively investigated the psychological impact of COVID-19 across all three groups and incorporates a wider range of psychological disorders, as well as negative emotional states likely to be experienced during the global pandemic. Thus, our work provides a more comprehensive representation and assessment of the wide-ranging psychological effects across all potential affected groups which is urgently needed in order to better prepare for the downstream consequences of a global pandemic. We therefore provide the first objective and collective evidence of the mental health needs during COVID-19 across these three specific populations which were intended to capture the prevalence of diverse mental health disorders as well as adverse emotional states. The prevalence of psychological distress is essential to evaluate the short to medium-term consequences of the COVID-19 pandemic to better inform healthcare systems.

## **Methods**

### *Study Design*

Our systematic review and meta-analysis targeted the inclusion of observational studies. It is registered with PROSPERO (CRD42020177446) and follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement (Moher et al., 2009).

### *Search Strategy*

A comprehensive search of seven electronic databases (PubMed, Medline, Embase, PsycInfo, Scopus, CINAHL and Web of Science) was conducted (LÖ) between March and April 2020 to identify observational studies, in multiple languages (English, Chinese, Italian, French, German, Spanish, Portuguese, or Italian), which reported the prevalence on psychological outcomes in the context of COVID-19 since the beginning on the pandemic. Search term variations of COVID-19 and selected psychological related conditions were systematically identified and searches were conducted up until 17 April 2020. A combination of the search fields “title”, “abstract” and ‘MeSH’/‘thesaurus’ were used to ensure the best possible search inclusion. No filters or limitation were applied to the search. After de-duplication was performed in Covidence (LÖ), blinded screening of titles and abstracts was completed independently by two authors (TA & IG) throughout the selection stages to obtain full text articles. Conflicts were resolved in discussion with a third author (DA). A comprehensive search log, including all search strings, results and notes, inclusion and exclusion criteria (Appendix 1).

### *Eligibility Criteria*

Inclusion criteria were 1) human studies which reported 2) original research data and 3) at least one psychological outcome since the emergence of COVID-19 in China in HCWs, the general population and/or those with confirmed or suspected COVID-19. Primary psychological outcomes for inclusion were anxiety, depression, post-traumatic stress disorder (PTSD), and stress. Secondary outcomes were anger, panic, frustration, fear, worry, suicidal ideation, self-harm, irritability, distress, disturbances of circadian rhythms and/or sleep. Primary and secondary outcomes had to be reported as prevalence with 95% confidence intervals (CI), or equivalent. The corresponding author was contacted by email to request any prevalence rate

not reported within the published paper, if the article was otherwise eligible. All articles were included for the meta-analysis, with the exception of those which had not undergone peer-review and/or were not published in a scientific journal.

#### *Data Extraction*

Potential confounders were systematically extracted including country of origin of the study, differences in population type, age of the sample, sex differences, sample size, instruments used to assess psychological outcome(s), population investigated, timing of the outbreak (time from the first case of COVID-19 in the region to the start of data collection) and month of publication. All data were extracted independently by two reviewers (TA & IG) to a data extraction sheet which was created by the team statistician (OMO). Data extraction discrepancies were resolved by the statistician (OMO).

#### *Quality Assessment and Risk of Bias*

All article deemed suitable for inclusion were assessed for quality using the Study Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies from the National Institutes of Health (National Heart). This was performed by two independent reviewers (TA & IG) and discrepancies were resolved by a third reviewer (DA).

#### *Statistical Analyses*

A random-effects model (DerSimonian-Laird method) was used to calculate the overall effect from effect sizes (Borenstein et al., 2010). Presence of heterogeneity between studies was evaluated by Cochrane's Q test and quantified by the I-square ( $I^2$ ) statistic (Melsen et al., 2014). Analyses were carried out using Stata 16 (StataCorp LP, USA). Meta-analyses were performed by using Metaprop module, designed to perform meta-analyses of proportions in Stata (Nyaga et al., 2014). The meta-analysis was conducted with prevalence estimates that had been

transformed using the double arcsine method to address the variance instability (Barendregt et al., 2013). The final pooled result and 95% CIs were back-transformed for ease of interpretation. Heterogeneity was evaluated with the idea to establish a potential relationship of the summary effect size with all the potential confounders systematically extracted. Two-sided p-values of 0.05 were considered statistically significant. Publication bias was assessed using the Doi plot and Luis Furuya-Kanamori asymmetry index (LFK index) (Furuya-Kanamori et al., 2018). Briefly, the presence of symmetry suggests no publication bias, whereas publication bias is expected in the absence of symmetry.

The primary analysis looked at prevalence rates of anxiety, depression, PTSD and stress. Secondary analyses were performed including prevalence of fear, insomnia, sleep quality, worry, anger and mixed outcomes. Mixed outcomes included the combination of more than one outcome resulting in a single prevalence rate. Subgroup analyses and meta-regressions were performed to assess potential influences on prevalence estimates. We compared prevalence estimates by identifiable confounders including region, type of workers, population, timing of COVID-19 and month of publication. Finally, to assess the impact of study quality on pooled prevalence, sensitivity analyses was performed for the primary analysis excluding low-quality studies.

## **Results**

A total of 3,233 references were captured which generated 1,701 articles, of which 84 were deemed potentially eligible for inclusion. Subsequent to full-text screening, 30 studies fulfilled our pre-defined inclusion criteria, 28 of which were eligible for the meta-analysis (Figure 1).

\*\*\*Insert Figure 1 here\*\*\*

Two studies were excluded from the meta-analysis as they were reports and not published peer-reviewed articles. Thirteen studies assessed anxiety as a primary outcome, 11 studies investigated depression. Thirteen studies were conducted in HCWs, 12 focused on psychological outcomes amongst the general population, and one study obtained data from both groups (Yuan et al., 2020). Two articles focused on those with suspected or infected COVID-19 patients (Nyaga et al., 2014, Bo et al., 2020). The majority of the included studies were conducted in Mainland China (n=20; 71%). Table 1 depicts data regarding specific psychological outcomes extracted from the included studies, according to population type. A summary of all studies that met our pre-defined inclusion criteria for the systematic review can be found in Table 2.

\*\*\*Insert Table 1 here\*\*\*

\*\*\*Insert Table 2 here\*\*\*

Meta-analysis results for the primary psychological outcomes are shown in Figure 2. The overall pooled prevalence across all of the primary outcomes was 26% (95% CI: 21-32). The included studies were assessed for heterogeneity and publication bias. There was evidence of substantial heterogeneity Q test ( $p < 0.001$ ) and  $I^2$  statistics ( $I^2 = 99.7\%$ ). The Doi plot showed no symmetry verifying the presence of bias but no evidence of bias was detected by the asymmetry index (LFK index = -0.15), shown in Figure 3. Our analysis revealed the pooled prevalence of PTSD was 33% (95% CI: 0-86), 28% for anxiety (95% CI: 21-36), 27% for stress (95% CI: 14-43), and 22% for depression (95% CI: 13-33).

\*\*\*Insert Figure 2 here\*\*\*

\*\*\*Insert Figure 3 here\*\*\*

Secondary analysis of all psychological outcomes (Supplementary Figure 1) showed that fears and worries were reported most frequently, 70% (95% CI: 53-85) and 68% (95% CI: 25-98), respectively. The combined prevalence across primary and secondary psychological outcomes was 34% (95% CI: 29-40). Table 3 shows the results of the meta-regression analyses for all outcomes including pooled estimates for subgroups based on region, type of workers, population, timing of COVID and month of publication. There was little evidence of an effect of any of these factors upon prevalence. However, based on study quality assessment (good: n=14; fair: n=7; poor: n=7), poor quality studies were more likely to report a higher prevalence compared to good quality studies (46% vs 27%, p=0.036). Sensitivity analysis (Supplementary Figure 2) did not substantially alter the findings, indicating a 27% overall prevalence of primary psychological outcomes across all included studies and populations.

\*\*\*Insert Table 3 here\*\*\*

## **Discussion**

We set out to assess the prevalence of psychological outcomes in response to the recent COVID-19 outbreak around the peak of the pandemic. Primary and secondary psychological outcomes were systematically quantified in a meta-analysis and a summary effect size was calculated for 97,173 individuals, in the context of the COVID-19 outbreak. The analyses showed that overall, the prevalence of adverse psychological responses across all studies was 26%. For the primary outcomes, which referred to defined mental health syndromes, the highest prevalence was for PTSD (33%). The overall prevalence of anxiety and depression were 28% and 22%, respectively. Fears (70%) and worries (68%) were the commonest

secondary psychological outcomes. The combined prevalence across primary and secondary psychological outcomes was 34%. These figures are above the expected 'non-epidemic' rates reported in epidemiological studies, (Holzer 3rd, 2013) and are consistent with the 2003 severe acute respiratory syndrome (Yip et al., 2010, Tsang et al., 2004) and with the predicted psychological impact of quarantine measures associated with COVID-19 (Brooks et al., 2020).

Human survival in the most disparate situations, requires an intrinsic homeostatic functional balance. The perturbation of this equilibrium induced by COVID-19 requires some adjustment in psychological and physiological functions to ensure survival which might explain the physiological and psychological responses measured in this study. This is consistent with the 'Reset Equilibrium Function' hypothesis proposed by Marks (Marks, 2018). Furthermore, COVID-19 has most likely contributed to a shift in the motivational drives according to Maslow's hierarchy of needs (Maslow, 1943) (Matias, Dominski & Marks, 2020), resulting in emotionally driven physiological responses (worry, fear, distress and anxiety) and behaviours such as stockpiling food and essential items, the need for self-protection, and reduction in social contact. The outcomes measured in this meta-analysis are potential downstream consequences of psychological mechanisms of adaptation, including changes in self-esteem and self-actualisation, potentially affected by the rising levels of unemployment, poverty and their likely impact on social status and self-determination (Matias, Dominski & Marks 2020).

From a methodological viewpoint, all studies applied a survey-based approach and data were mostly captured using online methods (18/30). However, some studies did not explicitly state if questionnaires were completed electronically or on paper (n=7), and one study collected data via a telephone survey (Wolf et al., 2020). A mixed-method design was applied in one study whereby participants were interviewed and were also asked to complete a series of validated

questionnaires (Cao et al., 2020a). A common concern about collecting data using online survey techniques is the risk of multiple biases (social desirability, recall, response and more) which could have influenced the overall findings. Response rates to survey-based designs were not reported for the majority (16/30), but for those that did report, the range was from 65.8% to 100%. Of note, is that some reported the completion rate (Wang et al., 2020a) rather than the response rate. However, with online surveys, unless emailed to a specific number of individuals, it is impossible to calculate the response rate when using snowball sampling methods. The majority of studies were cross-sectional (n=29), and one collected data across two time points, spaced two weeks apart (Yuan et al., 2020). The main limitation of cross-sectional studies is that causal associations cannot be assessed, although prevalence rates during COVID-19 can be compared to non-pandemic periods to draw conclusions. Most studies acquired data using validated tools to target specific outcomes of interest (n=26) but a small number (n=4) derived their own questions. The latter approach may have therefore compromised reliability of the findings and thus, weakened the quality of the study. Generally, the sample sizes were large and potentially adequate, although just one reported a power calculation. A total of three studies obtained information from <100 individuals, thus representativeness and generalizability of these study findings are questionable. We also draw attention to the pooled prevalence for PTSD which should be interpreted with caution, given the wide confidence intervals. Reasons for this are due to large variability in effect sizes across the studies that measured and reported on this outcome where the range was 0.94 - 0.07. Moreover, only four studies were captured for this disorder from our systematic search. Thus, we recommend additional future research which focuses on this condition, particularly amongst HCWs and COVID-19 patients who are hospitalized, as these are the two groups are most likely to be affected by PTSD.

It is likely that the cause for the increase in prevalence of mental health related symptoms in the context of COVID-19 is multifactorial. Holmes and colleagues have provided a detailed insight into the many reasons, which could play a role in this context, ranging from fear of contracting the infection to the social and economic consequences of the pandemic (Holmes et al., 2020). Fear of contracting the infection, quarantine measures for infected individuals, and self-isolation/ social distancing for the general population are however likely to have played a major role in the acute phase of the pandemic, which is the time of execution of most studies included in this meta-analysis. This is in agreement with the notion that quarantine measures can affect a third of the population under the condition of an epidemic (Brooks et al., 2020). Twenty of the studies included in this meta-analysis (71%, equivalent to 85,088 subjects), were conducted in China. We carried out a sub-analysis of the data from these 20 studies. Results suggest a pooled prevalence of all psychological outcomes of 27% (95% CI: 21-33). This prevalence figure is much higher than what reported by a recent epidemiological study conducted in China in 2019 prior to the pandemic. The work included 32,552 residents and found that the weighted prevalence of any psychological disorder (excluding dementia) was 9.3% (95% CI: 5.4-13.3) (Huang et al., 2019). Our prevalence figures are instead much closer to 22.9%, which is generated in the context of a psychiatric morbidity survey carried out 16 weeks post-SARS outbreak (Sim et al., 2010). However, a precise estimation of changes in prevalence attributable to COVID-19 is not possible with the cross-sectional studies included in this work. This evaluation would require longitudinal studies carried out before and after the pandemic.

The effect size of overall psychological issues between HCWs and the general population differed by just 1%, (34% vs. 33%). The psychological outcomes across these two groups are likely to be driven by different factors. For example, frontline HCWs, most likely exposed

every day to infected patients, might have been under considerable pressure to meet increased demands of healthcare systems during this unprecedented time. Indeed, some have suggested that this can leave HCWs prone to higher-than-normal levels of perceived stress, burnout, fear of being infected and of infecting their own family members, as well as of experiencing sleep and emotional disturbances (Kang et al., 2020). Moreover, medical staff treating seriously ill COVID-infected patients, could also be affected by the numerous patients' deaths. It is perhaps unsurprising that very high prevalence of depression (50.4%) and anxiety (64.6%) symptoms have been reported in HCWs (Lai et al., 2020, Kwok et al., 2020). On the other hand, data by Tan and colleagues indicate that medical staff have generally more capacity for resilience than non-medical staff (Tan et al., 2020). This is reflected in the reduced prevalence, by almost half in medical staff vs. non-medical staff, of symptoms of anxiety (10.8% versus 20.7%, respectively) and PTSD (5.7%, vs. 10.9%) in some studies (Tan et al., 2020). It is clear that several factors could have affected the results in HCWs, including level of training, experience or even the timing of when respondents completed the survey in relation to the rise or fall of COVID-treated patients. Given that there were just two studies with COVID-19 confirmed/suspected cases, and that these measured different outcomes (PTSD and depression), we did not conduct an overall pooled prevalence for this group.

Psychological issues amongst the general population are likely to be propelled by government-imposed restrictions. These include self-isolation, lockdown and social distancing, all of which limit social interaction with others. Social interaction and social support are known factors that influence both health behaviours and health outcomes, (Johnson and Acabchuk, 2018) thus the impact of social isolation upon psychological health outcomes are not unexpected. Moreover, tasks which were previously incorporated into daily lives such as shopping, sporting and social activities, are now limited and might affect psychological health in the general population.

Such restrictions, paired with media and social media exposure, are likely to increase fear, worries and anxiety about becoming infected. This notion was reflected by the data presented by Kwok and colleagues who found that 97% of 1,715 participants reported being worried about the virus (Kwok et al., 2020). This is also consistent with Gao and colleagues who found that increased social media use was associated with a 91% increased risk of depression and anxiety and a 72% increased risk of anxiety alone, after adjustment for a range of demographics (Gao et al., 2020). Nevertheless, it is unclear whether those living alone during anti-pandemic measures experience higher rates of mental health difficulties and the extent to which perceived social support mitigates these outcomes. This is important as loneliness is known to affect both cardiovascular and mental health outcomes (Courtin and Knapp, 2017). The potential impact of the interaction between quarantine measures and a host of other factors as infection of a family member, financial difficulties, unemployment and relationship breakdown is also unknown. Research on these issues is critical as many of these are risk factors for the onset and maintenance of mental health issues (Holmes et al., 2020).

One strength of many of the studies included in this review is the use of measures with well-established indices of reliability and validity, which allows for direct comparison and the calculation of a cumulative effect size. For example, in relation to depression, several studies utilized the PHQ-9 which has been extensively validated in different populations and multiple languages. The PHQ-9 was the mostly commonly used instrument to detect the presence of depressive symptoms depression +/- severity (utilised in >50% of the studies). In relation to the assessment of anxiety, a similar pattern emerged with six of the 13 studies relying on the seven-item Generalized Anxiety Disorder Scale (GAD-7). The GAD-7 is one of the most frequently used self-report scales, and severity assessment tool for generalised anxiety symptoms. It has also been subject to repeated investigations of its psychometric properties

across different contexts and in multiple languages. Although both instrument are not a substitute for a clinical assessment, they do benefit from established sensitivity and specificity which reduces the possibility of an inflationary effect compared to a formal assessment (Johnson et al., 2019). For example, in a large comparative study of clinical assessment versus the use of the GAD-7 in a sample of 956 patients, there was a convergence of scores in 89% of cases (Spitzer et al., 2006). Similar results have been reported in respect of the PHQ-9 for the assessment of depression (Levis et al., 2019). Other measures used (WHO-5, PCL-C, Self-Rating Depression Scale) also have established validity and reliability (Jokelainen et al., 2019, Topp et al., 2015, Conybeare et al., 2012). The widespread use in the studies included in this meta-analysis of well-established measures to assess symptoms of depression, anxiety and other disorders is reassuring.

Our work has several strengths. First, to our knowledge we are the first group to conduct a systematic review and meta-analysis to assess the full psychological impact of COVID-19. Second, we assessed the psychological impact across three different populations. Third, we examined a wide range of psychological outcomes including specific disorders as well as other emotional reactions such as worry and fear surrounding the pandemic. There are also some important considerations and limitations. First, the time point at which respondents completed the surveys is likely to have influenced the overall findings. For example, online questionnaires completed before, during or after the first peak in the affected country, would have allowed to estimate changes in prevalence. We did, however, attempt to overcome this aspect within our meta-regression analyses. Second, the majority of studies (20/28) were conducted in China, thus the findings may not be generalizable to other countries. Third, the studies included had varied methodological differences (seven of the 28 were deemed poor quality), hence the pooled estimate should be interpreted with caution. Although most studies used validated

instruments to assess the outcomes, there was still high heterogeneity between the studies. This could have been due to data collection methods or bias introduced by study methods. The impact of study quality on pooled prevalence was assessed by conducting a meta-regression comparing 'low quality' studies with those rated as 'fair or good' quality. We performed a subgroup analysis excluding the 'low' quality studies as meta-regressions showed some evidence of higher prevalence reporting in 'lower' quality studies compared to 'fair or good' quality studies. Fourth, there may be potential overlaps in sampling groups. For example, studies that recruited the general population may have included a small proportion of HCWs. This is likely to bias the observations and potentially result in higher prevalence rates of psychological outcomes being reported. In our sample, only one study (Yuan et al., 2020) presented data which included medical workers drawn from the general population (26.5% of the overall sample) and results were not dichotomized. Hence, only general population data, including the majority of the sample were accounted for in the analyses. Finally, whilst we did not include articles written in all possible languages but captured the majority of the epicentres where COVID was highly prevalent. Moreover, we demonstrate in our PRISMA flow diagram that no full-text articles were excluded based on language.

This research explores mental health related issues in the context of COVID-19. We have demonstrated the presence of psychological effects associated with the pandemic and the measures taken to control the spread of the virus. The work highlights the importance of addressing mental health needs whilst fulfilling the physical health necessities of suspected cases.

Through the epidemic at least until the virus is under control, the provision of mental health services can include telephonic and on-line consultations aside clinical interactions to reach those quarantined or in self-isolation more effectively, whilst facilitating the engagement of

individuals not able to undertake face-to-face consultations for a myriad of different reasons (Ju, Ng, Zhang & Li, 2020). Other valid tools to facilitate consultations related to mental health issues include online self-assessment resources to screen for psychopathology and help recognise patients most likely to require a more in-depth assessment. This approach can improve time management, rationalise resources and save costs. It is estimated that approximately 10,000 mental health ‘digital’ apps are currently available (Marshall, Dunsan & Bartik, 2019). These instruments can provide essential information, deliver simple interventions during the pandemic and personalise mental health care delivery during COVID-19 pandemic (Wilkinson, 2020).

In the medium to long-term, although the psychological effects of COVID-19 are currently unknown, in view of the prevalence rates detected in this meta-analysis in the acute phase, it is advisable that healthcare systems are proportionally prepared to meet the possible rise in demand for mental health services. Based on our findings during the early stages of the pandemic, there is a clear need to identify the long-term psychological consequences to ensure that there is an adequate provision of services. Should there be sustained demand, it is fundamental that resources are in place to provide necessary support to HCWs, the general population as well as to those directly affected by COVID-19. It is also important to ensure that frontline HCWs, whose psychological health may be directly and/or indirectly affected, are protected not just from the risk of contagion but also from psychological adversity and possible burnout.

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**Table 1:** Number of studies according to psychological outcomes and stratified by population type

	Population type		
	Healthcare workers	COVID-19 cases	General population
Anxiety	7	0	6
PTSD	2	1	1
Stress/distress	3	0	3
Depression	6	1	4
Anger	1	0	0
Fear	3	0	1
Worry	1	0	3
Sleep quality/insomnia	4	0	3
Mixed	1	0	1

<b>First author</b>	<b>Sample size</b>	<b>Country &amp; Quality</b>	<b>Population</b>	<b>Age (years)</b>	<b>Male gender (%)</b>	<b>Psychological outcome &amp; measure used</b>	<b>Prevalence of psychological outcome (95% CI) if reported</b>
Bo (Bo et al., 2020)	730	China <sup>1</sup>	CC	50.2 ± 12.9	49.1	PCL-C (PTSD)	<i>PTSD: 96.2% (94.8-97.6)</i>
Cai (Cai et al., 2020)	534	China <sup>3</sup>	HCWs	18-30 (42.4%) 31-40 (60.7%)	31.3	Author-derived	<i>Anger: slightly = 24.5%; moderate = 15.4%; very much = 5.8% Fear: slightly = 41.0%; moderate = 33.9%; very much = 6.7%</i>
Cao, J (Cao et al., 2020a)	37	China <sup>1</sup>	HCWs	32.8 ± 9.6	21.6	PHQ-9 (depression)	<i>Depression: 18.9%</i>
Cao, W (Cao et al., 2020b)	7,143	China <sup>1</sup>	GP	Not reported	30.35	GAD-7 (anxiety)	<i>Anxiety: overall = 24.9%; mild = 21.3%; moderate = 2.7%; severe = 0.9%</i>
Chung (Chung and Yeung, 2020)	69	Hong Kong <sup>3</sup>	HCWs	Not reported	Not reported	PHQ-9 (depression)	<i>Depression: mild = 34.8%; moderate = 14.5%</i>
Gao (Gao et al., 2020)	4,872	China <sup>1</sup>	GP	32.3 ± 10.0	32.3	WHO-5 (depression) GAD-7 (anxiety)	<i>Depression: 48.3% (46.9-49.7) Anxiety: 22.6% (21.4-23.8)</i>
Huang, J (Huang et al., 2020)	230	China <sup>2</sup>	HCWs	32.6 ± 6.2	18.7	SAS (anxiety) PTSD-SS (PTSD)	<i>Anxiety: women = 25.64%; men = 11.63% PTSD: women = 29.41%; men = 18.60%</i>

Huang, Y (Huang et al., 2019)	7,236	China <sup>1</sup>	GP	35.3 ± 5.6	45.4	GAD-7 (anxiety) CES-D (depression) PSQI (sleep quality)	<i>Anxiety: 35.1%</i> <i>Depression: 20.1%</i> <i>Sleep quality: 18.2%</i>
Kang (Kang et al., 2020)	994	China <sup>1</sup>	HCWs	18-25 (21.5%) 30s (34.1%) 40s (29.3%) 50s (11.5%) >50 (3.6%)	14.5	PHQ-9 (depression) GAD-7 (anxiety) ISI (insomnia) IES-R (distress)	<i>Mixed: mild = 34.4%; moderate = 22.4%; severe = 6.2%</i>
Kwok (Kwok et al., 2020)	1,715	Hong Kong <sup>2</sup>	GP	18-24 (26%) 25-34 (33%) 35-44 (22%) 45-54 (11%) ≥55 (8%)	31	HADS-A (anxiety) STAI (anxiety)	<i>Worry: 97%</i> <i>Anxiety: borderline = 30.7% (28.1-33.4); abnormal = 33.9% (31.3-36.5)</i>
Lai (Lai et al., 2020)	1,257	China <sup>1</sup>	HCWs	18-25 (15.8%) 26-30 (32.4%) 31-40 (32.3%) >40 (19.5%)	76.7	PHQ-9 (depression) ISI (Insomnia) GAD-7 (anxiety) IES-R (distress)	<i>Depression: 50.4%</i> <i>Anxiety: 44.6%</i> <i>Insomnia: 34%</i> <i>Stress: 71.5%</i>
Liu (Liu et al., 2020)	285	China <sup>1</sup>	GP	≤35 (47.7%) >35 (52.3%)	45.6	PCL-5 (PTSD) PSQI (sleep)	<i>PTSD: 7%</i> <i>Sleep quality: bad = 17.2%; very bad = 3.5%</i>
Lu (Lu et al., 2020)	2,299	China <sup>1</sup>	HCWs		22.1	HAMA (anxiety) HAMD (depression) Numerical scale (fear)	<i>Fear (medics): none/mild = 29.4%; moderate = 43.9%; severe/extreme = 26.7%</i> <i>Fear (admins): none/mild = 41.6%; moderate = 38.9%; severe/extreme = 19.5%</i> <i>Anxiety (medics): mild-moderate = 22.6%; severe/extreme = 2.9%</i>

Mo (Mo et al., 2020)	180	China <sup>2</sup>	HCWs	32.71 ± 6.52	10	SOS (stress) SAS (anxiety) Unknown sleep instrument	<i>Anxiety (admins):</i> mild-moderate = 17.1%; severe/extreme = 1.6% <i>Depression (medics):</i> mild-moderate = 11.8%; severe/extreme = 0.3% <i>Depression (admins):</i> mild-moderate = 8.2%; severe/extreme = 0% <i>Worry (medics):</i> 26.2% <i>Worry (admins):</i> 21.4% <i>Stress: high</i> = 22.22% <i>Sleep: not good</i> = 10%; bad = 4.44%
Moghadasi* (Naser Moghadasi, 2020)	14	Iran <sup>3</sup>	HCWs	40.58 ± 4.44	50	BIA (anxiety)	<i>Anxiety: not reported</i> <i>Anxiety: mild</i> = 14.3%; moderate = 0%; severe = 0%
Nguyen (Nguyen et al., 2020)	3,947	Vietnam <sup>1</sup>	CC	44.4 ± 17.0	44.3	PHQ-9 (depression)	<i>Depression: 7.4%</i>
Pulvirenti (Pulvirenti et al., 2020)	158	Italy <sup>2</sup>	GP	47.3 ± 13.8	50	GHQ-12 (anxiety & depression)	<i>Mixed (depression/anxiety): 42.3%</i>
Qiu (Qiu et al., 2020)	52,730	China <sup>2</sup>	GP	Not reported	35.3	CPDI (distress, anxiety, depression)	<i>Distress: mild</i> = 29.29%; severe = 5.1%
Roy (Roy et al., 2020)	662	India <sup>3</sup>	GP	29.09 ± 8.83	48.6	Author-derived questions	<i>Worry: 72%</i> <i>Difficulty with sleep: 12.5%</i> <i>Fear: 41%</i>

Tan (Tan et al., 2020)	470	Singapore <sup>1</sup>	HCWs	31 (28-36)	31.7	DASS-21 (depression, anxiety & stress) IES-R (PTSD)	<i>Depression (medics): 8.1%</i> <i>Anxiety (medics): 10.8%</i> <i>Stress (medics): 6.4%</i> <i>PTSD (medics): 5.7%</i> <i>Depression (non-medics): 10.3%</i> <i>Anxiety (non-medics): 20.7%</i> <i>Stress (non-medics): 6.9%</i> <i>PTSD (non-medics): 10.9%</i>
Wang, C (Wang et al., 2020a)	1,210	China <sup>1</sup>	GP	12-21.4 (28.4%) 21.4-30.8 (53.1%) 30.8-40.2 (7.8%) 40.2-49.6 (7.4%) 49.6-59 (3.2%)	32.7	IES-R (psychological impact) DASS-21 (depression, anxiety & stress)	<i>Mixed: minimal = 24.5%; mild = 21.7%; moderate-severe = 53.8%</i> <i>Depression: mild = 13.8%; moderate = 12.2%; severe/extremely severe = 4.3%</i> <i>Anxiety: mild = 7.5%; moderate = 20.4%; severe/extremely severe = 8.4%</i> <i>Stress: mild = 24.1%; moderate = 5.5%; severe/extremely severe = 2.6%</i>
Wang, Y (Wang et al., 2020b)	600	China <sup>1</sup>	GP	34 ± 12	44.5	SAS (anxiety) SDS (depression)	<i>Anxiety: mild = 5.67%; moderate = 0.67%; severe = 0%</i> <i>Depression: mild = 14.33%; moderate = 2.5%; severe = 0.33%</i>

Wolf (Wolf et al., 2020)	630	USA <sup>3</sup>	GP	62.1 ± 11.3	40.3	Based on unspecified modified questionnaires	<i>Worry</i> : little = 23.4%; somewhat = 39.1%; very = 24.6%
Xiao* (Xiao et al., 2020)	180	China <sup>2</sup>	HCWs	Not reported	28.3	SAS (anxiety) SASR (stress reactivity) PSQI (sleep)	<i>Poor sleep quality</i> : 63.89% <i>Anxiety</i> : 58.889% <i>Stress</i> : not provided
Yuan (Yuan et al., 2020)	939	China <sup>2</sup>	GP & HCWs	18-24 (35.89%) 25-39 (35.57%) 40-59 (27.16%) ≥60 (1.38%)	38	SRQ (stress) PSQI (sleep)	<i>Sleep quality</i> : became serious = 36.43%
Zhang, W (Zhang et al., 2020)	2,182	China <sup>1</sup>	HCWs	<18 (0.5%) 18-60 (96.3%) >60 (3.2%)	35.8	PHQ-4 (anxiety & depression) ISI (insomnia)	<i>Insomnia</i> : 33.9% <i>Anxiety</i> : 10.4% <i>Depression</i> : 10.6%
Zhang, Y (Zhang and Ma, 2020)	263	China <sup>3</sup>	GP	37.7 ± 14.0	40.3	IES (stress)	<i>Stress</i> : moderate-severe = 7.6%
Zhou (Zhou et al., 2020)	1,357	China <sup>3</sup>	HCWs	Not reported	46.65	Author-derived questions	<i>Fear</i> : 85%
Sheffield (Sheffield, 2020)	2,000	UK	GP	≥18	Not reported	GAD-7 (anxiety); PHQ-9 (depression); ITQ (PTSD)	<i>Depression</i> : 22% <i>Anxiety</i> : 22% <i>PTSD</i> : 17%
KCL (London, 2020)	2,250	UK	GP	18-75	Not reported	Author-generated	<i>Anxiety/depression</i> : 50% <i>Poor sleep</i> : 38%

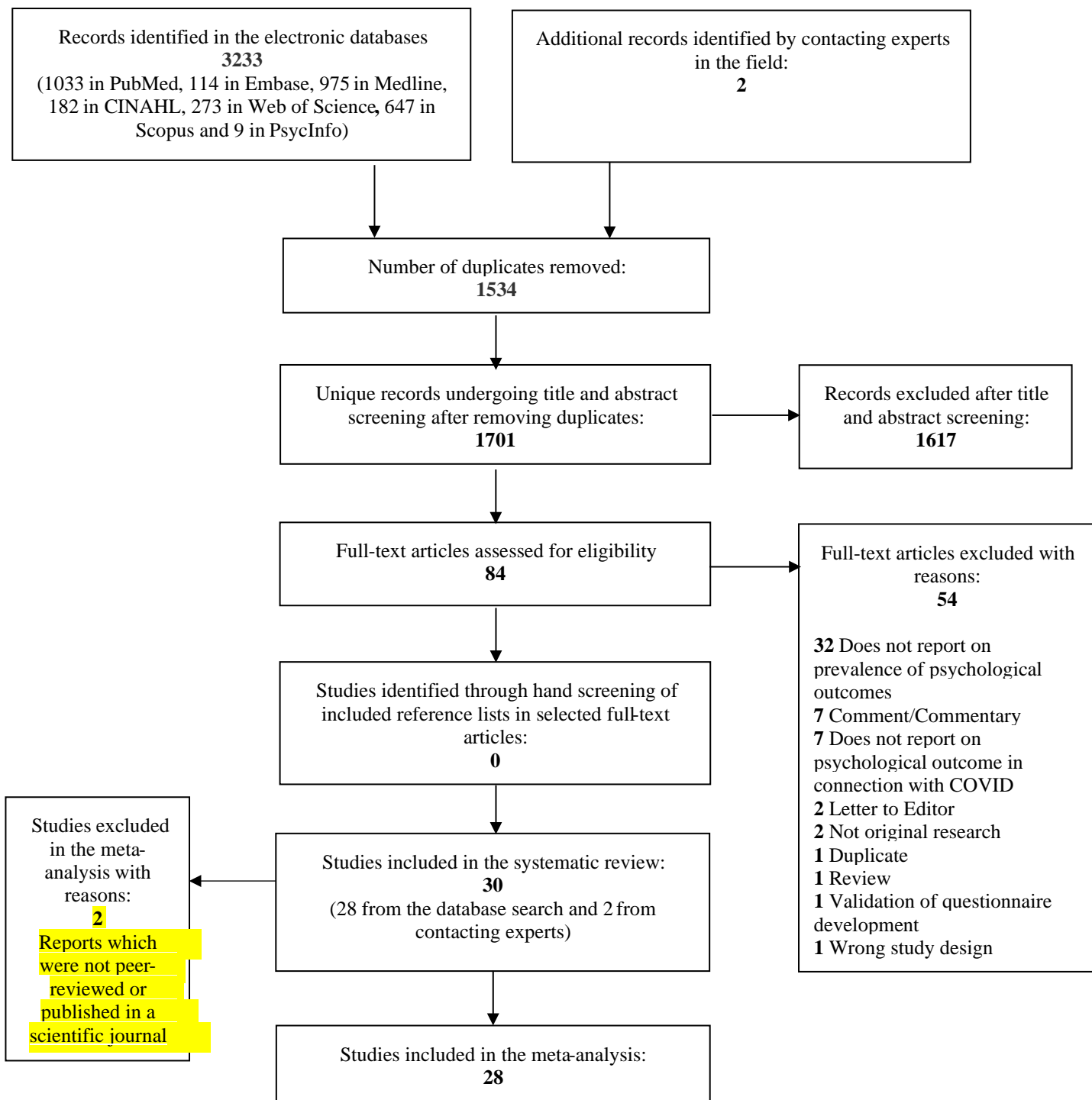
**Table 2:** Details of included studies, extracted data and quality assessment

BAI = Becks Anxiety Inventory; CC=COVID Cases; CES-D = Center for Epidemiology Scale for Depression; CPDI = COVID-19 Peritraumatic Distress Index; DASS-21 = Depression, Anxiety Stress Scale; GAD-7 = Generalized Anxiety Disorder; GP = General Population; GHQ-12 = General Health Questionnaire; HADS-A = Hospital Anxiety Depression Scale–Anxiety; HAMA = Hamilton Anxiety Scale; HAMD = Hamilton Depression Scale; HCW = Healthcare Workers; IES-R = Impact of Event Scale-Revised; ISI = Insomnia Severity Scale; ITQ = International

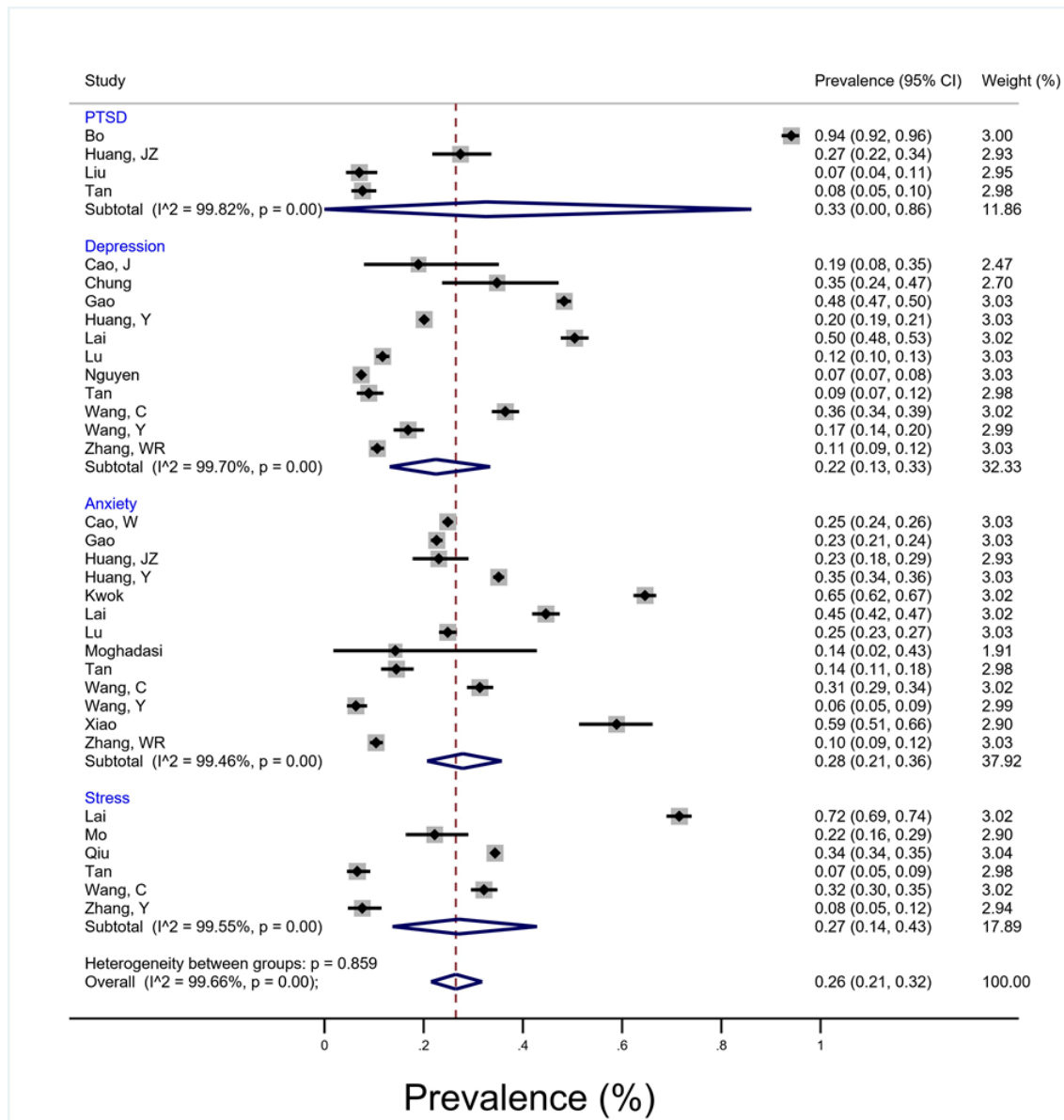
Trauma Questionnaire; KCL = King's College London; PHQ-9 = Patient Health Questionnaire; PTSD-SS = Post Traumatic Stress Disorder - Short Scale; PSQI = Pittsburgh Sleep Quality Index; SAS = Self-rating Anxiety Scale; SASR = Stanford Acute Stress Reaction; SDS = Self-rating Depression Scale; SOS = Stress Overload Scale; State-Trait Anxiety Inventory; SRQ = Stress Response Questionnaire; STAI = UK = United Kingdom; USA = United States of America; WHO-5 = World Health Organization-Five Well-being Index. \*article does not contain prevalence data but the information was provided by email communication. Quality assessment: <sup>1</sup>=good quality; <sup>2</sup>=fair quality; <sup>3</sup>=poor quality.

	Subgroup analyses			Meta- regression	
	Number of estimates	Pooled estimate (95% CI)	I <sup>2</sup> , (%)	Mean difference (95% CI)	p-value
All estimates	53	34 (29 – 40)	99.7		
<b>Region</b>					
China and south-east Asia	47	33 (28 – 39)	99.8	ref.	
Other	6	41 (20 – 64)	99.3	9 (-14 to 31)	0.435
<b>Type of workers</b>					
Medics	46	36 (30 – 42)	99.7	ref.	
Medics and non-medics	7	25 (12 – 41)	99.8	-10 (-30 to 9)	0.296
<b>Population</b>					
General population	22	33 (27 – 40)	99.8	ref.	
Healthcare workers	28	34 (24 – 44)	99.7	1 (-13 to 15)	0.870
<b>Timing of COVID*</b>					
1 month	9	27 (4 – 60)	99.9	ref.	
2 months	5	46 (23 – 70)	99.4	17 (-11 to 45)	0.234
3 months +	39	35 (29 – 40)	99.7	6 (-13 to 25)	0.513
<b>Month of publication</b>					
March	27	34 (27 – 41)	99.7	ref.	
April	26	35 (25 – 45)	99.8	1 (-13 to 15)	0.855
<b>Quality of study</b>					
Poor	10	46 (26 – 66)	99.5	ref.	
Fair	11	45 (26 – 64)	99.8	-4 (-25 to 18)	0.728
Good	32	27 (22 – 34)	99.7	-19 (-40 to -2)	0.036

**Table 3:** Results of subgroup analyses and meta-regression analyses based on region, type of workers, population, timing of COVID and month of publication \*Time from first case of COVID in the region to start of data collection



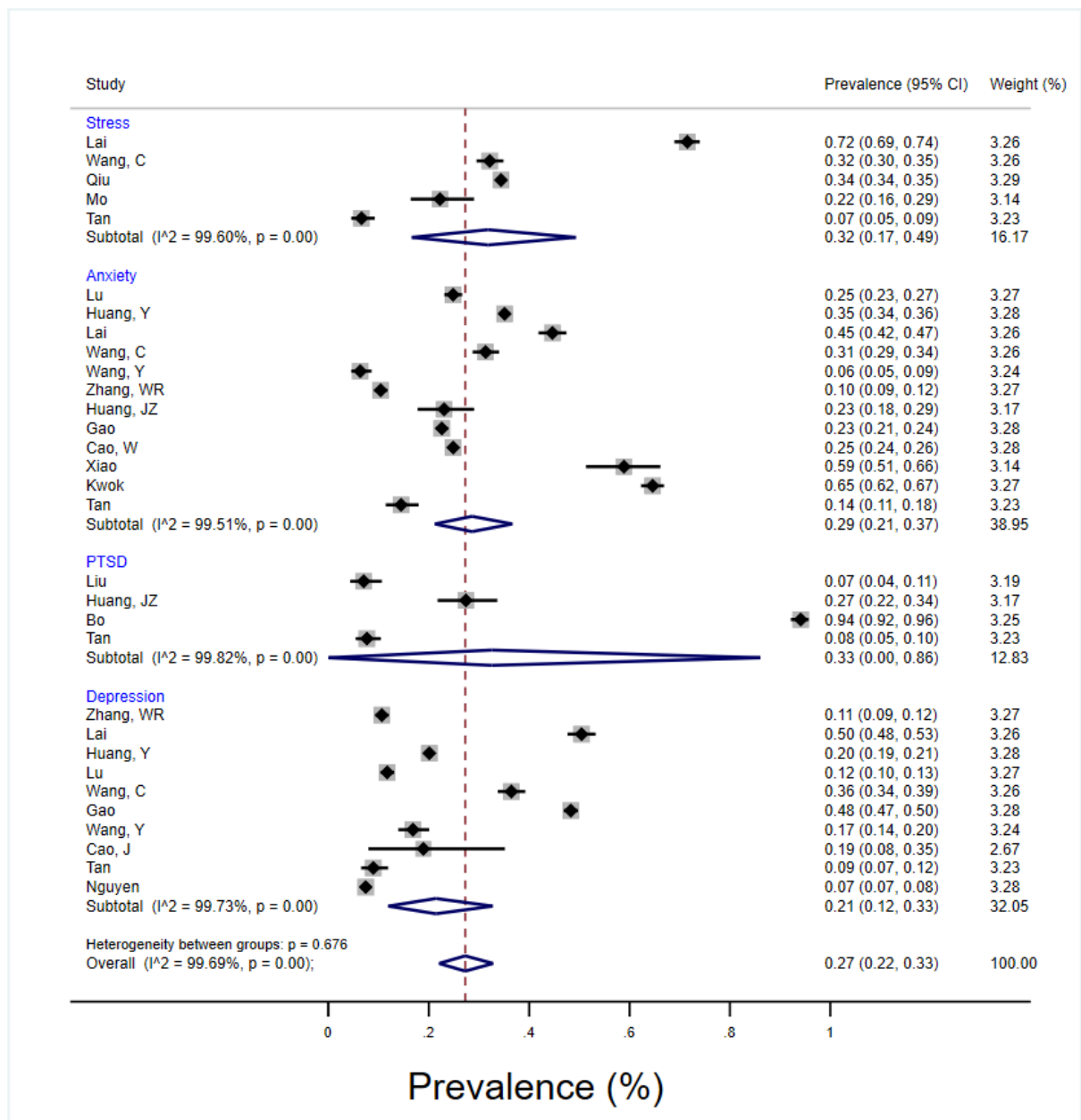
**Figure 1:** PRISMA 2009 flow diagram



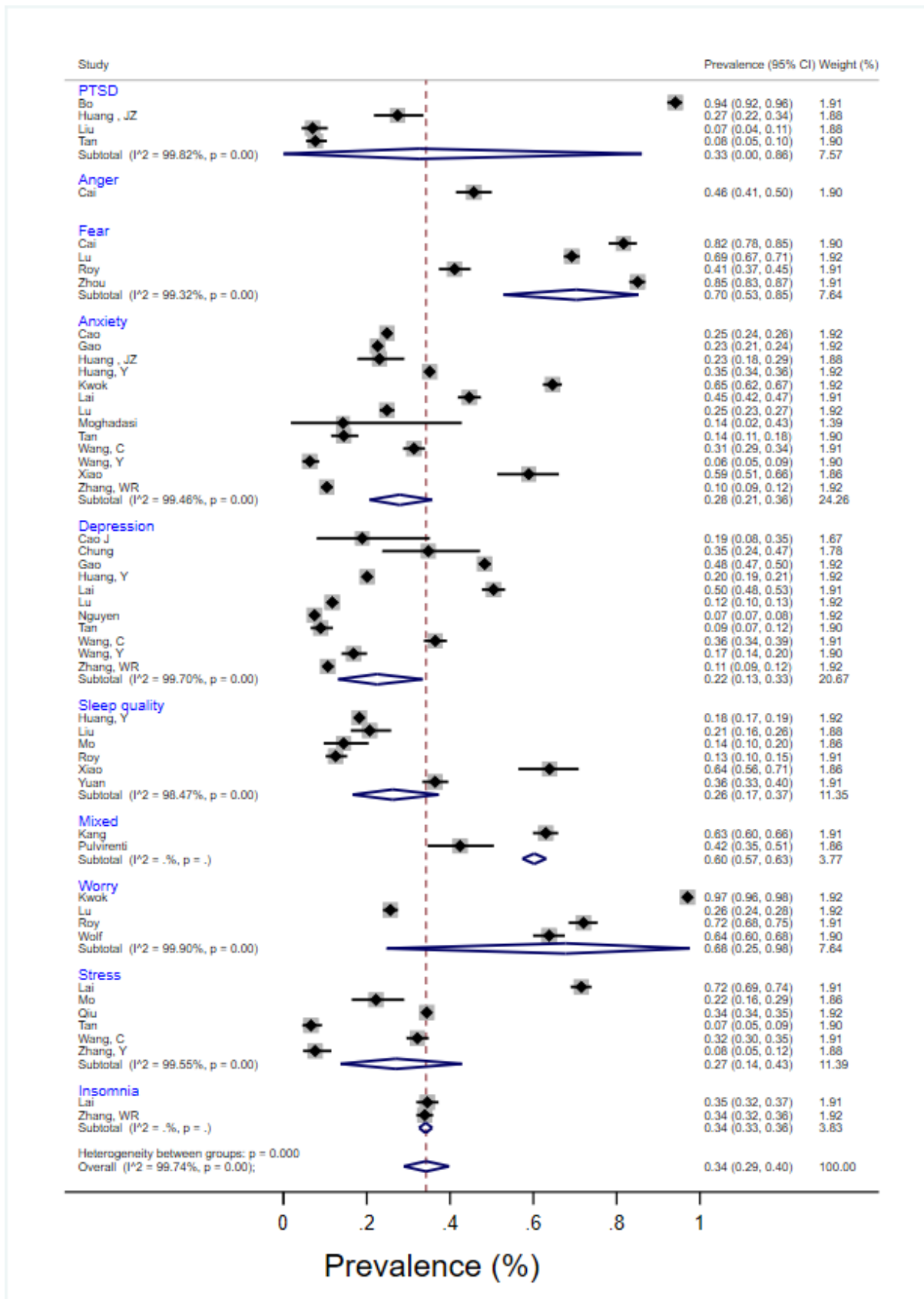
**Figure 2:** Forest plot for all included studies which reported on the prevalence of one or more primary psychological outcomes



**Figure 3:** Doi plot analysis and LFK index of publication bias



**Supplementary Figure 1: Secondary analysis of all psychological outcomes**



**Supplementary Figure 2:** Sensitivity analysis demonstrating the pooled prevalence of all psychological outcomes for studies ranked as good or fair quality

## Appendix 1

### Literature search

Source	Search string	Results	Notes
<b>PubMed</b>  <b>Coverage:</b> 1809-  <b>Search date:</b> 2020-04-17	(((depression[Title/Abstract] OR depressed[Title/Abstract] OR depressive[Title/Abstract] OR mental*[Title/Abstract] OR psychiatr*[Title/Abstract] OR psychological*[Title/Abstract] OR psychosocial[Title/Abstract] OR anxiety[Title/Abstract] OR anxious[Title/Abstract] OR anxieties [Title/Abstract] OR furious*[Title/Abstract] OR hopeless*[Title/Abstract] OR hypervigilance [Title/Abstract] OR psychology[Title/Abstract] OR fear[Title/Abstract] OR fears[Title/Abstract] OR panic*[Title/Abstract] OR stress[Title/Abstract] OR stressed[Title/Abstract] OR PTSD[Title/Abstract] OR suicid*[Title/Abstract] OR nervous*[Title/Abstract] OR confusion*[Title/Abstract] OR confused [Title/Abstract] OR angry[Title/Abstract] OR anger*[Title/Abstract] OR aggress*[Title/Abstract] OR rage[Title/Abstract] OR rages[Title/Abstract] OR mood[Title/Abstract] OR moods[Title/Abstract] OR worry*[Title/Abstract] OR worries[Title/Abstract]OR affect[Title/Abstract] OR affects[Title/Abstract] OR emotion*[Title/Abstract] OR apathy[Title/Abstract] OR apathetic[Title/Abstract] OR distress*[Title/Abstract] OR sad[Title/Abstract] OR sadness[Title/Abstract] OR anguish[Title/Abstract] OR unhapp*[Title/Abstract] OR frustrat*[Title/Abstract] OR loneliness[Title/Abstract] OR lonely [Title/Abstract] OR suffering[Title/Abstract] OR suffer[Title/Abstract] OR misery[Title/Abstract] OR miserable[Title/Abstract] OR despair[Title/Abstract] OR angst[Title/Abstract] OR agony [Title/Abstract] OR sleep*[Title/Abstract] OR insomnia[Title/Abstract] OR “circadian rhythms” [Title/Abstract] OR “circadian rhythm”[Title/Abstract] OR “biological rhythms”[Title/Abstract] OR “biological rhythm”[Title/Abstract] OR trauma*[Title/Abstract] OR irrita*[Title/Abstract] OR indignation*[Title/Abstract] OR conflict*[Title/Abstract] OR “self-injury”[Title/Abstract] OR “self-harm” [Title/Abstract] OR “self-harming”[Title/Abstract] OR “self-mutilation”[Title/Abstract] OR "self-mutilations"[Title/Abstract] OR “self-Injurious”[Title/Abstract] OR “self-destructive” [Title/Abstract] OR automutilation[Title/Abstract] OR "auto-mutilation"[Title/Abstract] OR delusion* [Title/Abstract] OR isolation*[Title/Abstract] OR isolate*[Title/Abstract] OR quarantine* [Title/Abstract] OR lockdown[Title/Abstract] OR "lock-down"[Title/Abstract] OR “social-distancing” [Title/Abstract] OR "Depression"[Mesh] OR "Mental Health"[Mesh] OR "Psychiatry"[Mesh] OR "Anxiety"[Mesh] OR "Psychology"[Mesh] OR "Psychosocial Deprivation"[Mesh] OR "Psychosocial Support Systems"[Mesh] OR "Fear"[Mesh] OR "Panic"[Mesh] OR "Stress Disorders, Traumatic, Acute"[Mesh] OR "Stress Disorders, Traumatic"[Mesh] OR "Stress, Psychological"[Mesh] OR "Stress Disorders,	<b>1033</b>	All terms are searched in the fields: “title” and “abstract” (here marked with TI/AB) and in MeSH (when available).  No filters or limitations applied.

	<p>Post-Traumatic"[Mesh] OR "Occupational Stress"[Mesh] OR "Suicide"[Mesh] OR "Confusion"[Mesh] OR "Anger"[Mesh] OR "Aggression"[Mesh] OR "Irritable Mood"[Mesh] OR "Affect"[Mesh] OR "Apathy"[Mesh] OR "Psychological Distress"[Mesh] OR "Sadness"[Mesh] OR "Frustration"[Mesh] OR "Loneliness"[Mesh] OR "Sleep"[Mesh] OR "Circadian Rhythm"[Mesh] OR "Conflict, Psychological"[Mesh] OR "Self Mutilation"[Mesh] OR "Self-Injurious Behavior"[Mesh] OR "Delusions"[Mesh] OR "Social Isolation"[Mesh] OR "Quarantine"[Mesh] OR "Hospitals, Isolation"[Mesh] OR "Patient Isolation"[Mesh] OR "Emotions"[Mesh:NoExp])) AND ((“2019-nCoV”[Title/Abstract] OR “novel coronavirus”[Title/Abstract] OR “COVI-19”[Title/Abstract] OR “COVID19” [Title/Abstract] OR “2019 coronavirus”[Title/Abstract] OR “COVID-19”[Title/Abstract] OR “COVID-2019”[Title/Abstract] OR "2019 coronavirus"[Title/Abstract] OR “Wuhan coronavirus” [Title/Abstract] OR “coronavirus disease 2019”[Title/Abstract] OR ”coronavirus disease 19” [Title/Abstract] OR "COVID-19" [Supplementary Concept]))</p>		
<p><b>Scopus</b>  <b>Coverage:</b> 1788-  <b>Search date:</b> 2020-04-17</p>	<p>((TITLE-ABS-KEY (<i>depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR furious* OR hopeless*</i> OR <i>hypervigilance OR psychology OR fear OR fears OR panic* OR stress OR stressed OR PTSD</i> OR <i>suicid* OR nervous* OR confusion* OR confused OR angry OR anger* OR aggress* OR rage</i> OR <i>rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat*</i> OR <i>loneliness OR lonely OR suffering OR suffer OR misery OR miserable OR despair OR angst</i> OR <i>agony OR sleep* OR insomnia OR "circadian rhythms" OR "circadian rhythm" OR "biological rhythms" OR "biological rhythm" OR trauma* OR irrita* OR indignation* OR conflict* OR "self-injury" OR "self-harm" OR "self-harming" OR "self-mutilation" OR "self-mutilations" OR "self-Injurious" OR "self-destructive" OR automutilation OR "auto-mutilation" OR delusion* OR isolation* OR isolate* OR quarantine* OR lockdown OR "lock-down" OR "self-destructive" OR automutilation OR "automutilation" OR delusion* OR isolation* OR isolate* OR quarantine* OR lockdown OR "lock-down" OR "social-distancing") AND ( TITLE-ABS-KEY ("2019-nCoV" OR "novel coronavirus" OR "COVID-19" OR “COVID19” OR "2019 coronavirus" OR "COVI-19" OR "COVID-2019" OR "2019 coronavirus" OR "Wuhan coronavirus" OR "coronavirus disease 2019" OR "coronavirus disease-19"))</i></p>	<p><b>647</b></p>	<p>All terms are searched in the fields: “title”, “abstract and “keywords” (here marked with “TITLE-ABS-KEY”).</p> <p>No thesaurus available.</p> <p>No filters or limitations applied.</p>

<p><b>Web of Science</b> (Core Collection)</p> <p><b>Coverage:</b> 1955-</p> <p><b>Search date:</b> 2020-04-17</p>	<p>((TOPIC: "2019-nCoV" OR "novel coronavirus" OR "COVI-19" OR "2019 coronavirus" OR "COVID-19" OR "COVID19" OR "COVID-2019" OR "2019 coronavirus" OR "Wuhan coronavirus" OR "coronavirus disease 2019" OR "COVID19" OR "coronavirus disease-19") AND (TOPIC: depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR furious* OR hopeless* OR hypervigilance OR psychology OR fear OR fears OR panic*OR stress OR stressed OR PTSD OR suicid* OR nervous*OR confusion* OR confused OR angry OR anger*OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR suffering OR suffer OR misery OR miserable OR despair OR angst OR agony OR sleep* OR insomnia OR "circadian rhythms" OR "circadian rhythm" OR "biological rhythms" OR "biological rhythm" OR trauma*OR irrita* OR indignation* OR conflict* OR "self-injury" OR "self-harm" OR "self-harming" OR "self-mutilation" OR "self-mutilations" OR "self-Injurious" OR "self-destructive" OR automutilation OR "auto-mutilation" OR delusion*OR isolation* OR isolate* OR quarantine* OR lockdown OR "lock-down" OR "social-distancing"))</p>	<p><b>273</b></p>	<p>All terms are searched in the field: "topic" (including title, abstract and author supplied keywords, here marked with "TOPIC").</p> <p>No filters or limitations applied.</p> <p>No thesaurus available.</p>
<p><b>Embase</b></p> <p><b>Coverage:</b> 1947-</p> <p><b>Source:</b> Embase only</p> <p><b>Search date:</b> 2020-04-17</p>	<p>(('2019 novel coronavirus':ab,ti OR 'novel coronavirus 2019':ab,ti OR 'covid-19':ab,ti OR 'covid-19':ab,ti OR 'covid-2019':ab,ti OR '2019 coronavirus':ab,ti OR 'wuhan coronavirus':ab,ti OR 'coronavirus disease 2019':ab,ti OR 'coronavirus disease-19':ab,ti OR '2019-ncov':ab,ti) AND (depression:ab,ti OR depressed:ab,ti OR depressive:ab,ti OR mental*:ab,ti OR psychiatr*:ab,ti OR psychological*:ab,ti OR psychosocial:ab,ti OR anxiety:ab,ti OR anxious:ab,ti OR anxieties:ab,ti OR hypervigilance:ab,ti OR psychology:ab,ti OR fear:ab,ti OR fears:ab,ti OR panic*:ab,ti OR stress:ab,ti OR stressed:ab,ti OR ptsd:ab,ti OR suicid*:ab,ti OR nervous*:ab,ti OR confusion*:ab,ti OR confused:ab,ti OR angry:ab,ti OR anger*:ab,ti OR aggress*:ab,ti OR rage:ab,ti OR rages:ab,ti OR mood:ab,ti OR moods:ab,ti OR worry*:ab,ti OR worries:ab,ti OR affect:ab,ti OR affects:ab,ti OR emotion*:ab,ti OR apathy:ab,ti OR apathetic:ab,ti OR distress*:ab,ti OR sad:ab,ti OR sadness:ab,ti OR anguish:ab,ti OR unhapp*:ab,ti OR frustrat*:ab,ti OR loneliness:ab,ti OR lonely:ab,ti OR 'suffering':ab,ti OR 'suffer':ab,ti OR misery:ab,ti OR miserable:ab,ti OR despair:ab,ti OR angst:ab,ti OR agony:ab,ti OR sleep*:ab,ti OR insomnia:ab,ti OR 'circadian rhythms':ab,ti OR 'circadian rhythm':ab,ti OR 'biological rhythms':ab,ti OR 'biological rhythm':ab,ti OR trauma*:ab,ti OR irritab*:ab,ti OR indignation*:ab,ti OR conflict*:ab,ti OR 'self-injury':ab,ti OR 'self harm':ab,ti OR 'self-harming':ab,ti OR 'self-mutilation':ab,ti OR 'self-mutilations':ab,ti OR 'self-injurious':ab,ti OR 'self-destructive' OR delusion*:ab,ti OR isolation*:ab,ti OR isolate*:ab,ti OR quarantine*:ab,ti OR 'lock-down':ab,ti OR lockdown:ab,ti OR 'social-distancing':ab,ti OR 'depression'/de OR 'mental health'/de OR 'psychiatry'/de OR 'anxiety'/de OR 'psychology'/de OR 'social isolation'/de OR hopeless*:ab,ti OR furious*:ab,ti OR 'psychosocial care'/de OR 'fear'/de OR 'panic'/de OR 'acute stress disorder'/de OR 'posttraumatic stress disorder'/de OR 'mental stress'/de OR 'job stress'/de OR 'suicide'/de OR 'confusion'/de OR 'acute confusion'/de OR 'anger'/de OR 'aggression'/de OR 'irritability'/de OR 'affect'/de</p>	<p><b>114</b></p>	<p>All terms searched in the fields: "title" and "abstract" (here marked with ":ab,ti") and in the "thesaurus" (here marked with "/de") when available.</p> <p>No filters or limitations applied.</p> <p>Thesaurus (Emtree) variations compared to PubMed's MeSH are applied as per availability and recommendati on in Embase.</p>

	OR 'apathy'/de OR 'distress syndrome'/de OR 'sadness'/de OR 'frustration'/de OR 'loneliness'/de OR 'sleep'/de OR 'circadian rhythm'/de OR 'conflict'/de OR 'automutilation'/de OR 'delusion'/de OR 'quarantine'/de OR 'isolation hospital'/de OR 'patient isolation'/de OR 'emotion'/de OR 'hopelessness'/de OR 'unhappiness'/de OR 'insomnia'/de))		
<b>Medline</b> (Web of Science)  <b>Coverage:</b> 1950-  <b>Search date:</b> 2020-04-17	((((MeSH HEADING:exp: Depression OR “Mental Health” OR Psychiatry OR Anxiety OR Psychology OR “Psychosocial Deprivation” OR “Psychosocial Support Systems” OR Fear OR Panic OR “Stress Disorders Traumatic Acute” OR “Stress Disorders Traumatic” OR “Stress Psychological” OR “Stress Disorders Post Traumatic” OR “Occupational Stress” OR Suicide OR Confusion OR Anger OR Aggression OR “Irritable Mood” OR Affect OR Apathy OR “Psychological Distress” OR Sadness OR Frustration OR Loneliness OR Sleep OR “Circadian Rhythm” OR “Conflict Psychological” OR “Self Mutilation” OR “Self Injurious Behavior” OR Delusions OR “Social Isolation” OR Quarantine OR “Hospitals Isolation” OR “Patient Isolation”) OR (MeSH HEADING: emotions) OR (TOPIC: depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR hypervigilance OR psychology OR fear OR fears OR panic* OR stress OR stressed OR PTSD OR suicid* OR nervous* OR confusion* OR confused OR angry OR anger* OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR furious* OR hopeless* OR "suffering" OR "suffer" OR misery OR miserable OR despair OR angst OR agony OR sleep* OR insomnia OR "circadian rhythms" OR "circadian rhythm" OR "biological rhythms" OR "biological rhythm" OR trauma* OR irritab* OR indignation* OR conflict* OR "self-injury" OR "self-harm" OR "self-harming" OR "self-mutilation" OR "self-mutilations" OR "self-Injurious" OR "self-destructive" OR automutilation OR "auto-mutilation" OR delusion* OR isolation* OR isolate* OR quarantine* OR "lock-down" OR lockdown OR "social-distancing") AND (TOPIC: "2019 novel coronavirus" OR "2019-ncov" OR "novel coronavirus 2019" OR "COVI-19" OR "2019 coronavirus" OR "COVID-19" OR "COVID-2019" OR "2019 coronavirus" OR "Wuhan coronavirus" OR "coronavirus disease 2019" OR "coronavirus disease-19" OR "2019-nCoV"))))	<b>975</b>	All terms searched in the fields: “Topic” (including title, abstract and author supplied keywords, here marked with “TOPIC”) and in “MeSH” (here marked with “MeSH HEADING”) when available.  No filters or limitations applied.  MeSH variations compared to PubMed’s MeSH are applied as per availability and recommendation in Medline.
<b>CINAHL</b> (EBSCO)  <b>Coverage:</b> 1946-  <b>Search date:</b> 2020-04-17	TI ( “2019-nCoV” OR “novel coronavirus” OR “COVI-19” OR “2019 coronavirus” OR “COVID-19” OR “COVID-2019” OR “COVID19” OR "2019 coronavirus" OR “Wuhan coronavirus” OR “coronavirus disease 2019” OR ”coronavirus disease-19” ) OR AB ( “2019-nCoV” OR “novel coronavirus” OR “COVI-19” OR “2019 coronavirus” OR “COVID-19” OR “COVID-2019” OR “COVID19” OR "2019 coronavirus" OR “Wuhan coronavirus” OR “coronavirus disease 2019” OR ”coronavirus disease-19” ) AND TI ( depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR furious* OR hopeless* OR hypervigilance OR psychology OR fear OR fears OR panic*OR stress OR stressed OR PTSD OR suicid* OR nervous*OR confusion* OR confused OR angry OR anger*OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR	<b>182</b>	All terms are searched in the fields: “title” and “abstract” (here marked with “TI and “AB”) and in the “subject headings” (here marked with “MH”) when available.

	<p>affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR suffering OR suffer OR misery OR miserable OR despair OR angst OR agony OR sleep* OR insomnia OR “circadian rhythms” OR “circadian rhythm” OR “biological rhythms” OR “biological rhythm” OR trauma*OR irrita* OR indignation* OR conflict* OR “self-injury” OR “self-harm” OR “self-harming” OR “self-mutilation” OR "self-mutilations" OR “self-Injurious” OR “self-destructive” OR automutilation OR "auto-mutilation" OR delusion*OR isolation* OR isolate* OR quarantine* OR lockdown OR "lock-down" OR “social-distancing” ) OR AB ( depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR furious* OR hopeless* OR hypervigilance OR psychology OR fear OR fears OR panic*OR stress OR stressed OR PTSD OR suicid* OR nervous*OR confusion* OR confused OR angry OR anger*OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR suffering OR suffer OR misery OR miserable OR despair OR angst OR agony OR sleep* OR insomnia OR “circadian rhythms” OR “circadian rhythm” OR “biological rhythms” OR “biological rhythm” OR trauma*OR irrita* OR indignation* OR conflict* OR “self-injury” OR “self-harm” OR “self-harming” OR “self-mutilation” OR "self-mutilations" OR “self-Injurious” OR “self-destructive” OR automutilation OR "auto-mutilation" OR delusion*OR isolation* OR isolate* OR quarantine* OR lockdown OR "lock-down" OR “social-distancing”) OR (MH "Depression" OR "Mental Health" OR "Psychiatry" OR "Anxiety" OR "Psychology" OR "Psychosocial Deprivation" OR "Support, Psychosocial" OR "Fear" OR "Stress Disorders, Post-Traumatic" OR "Stress, Psychological" OR "Stress, Occupational" OR "Suicide+" OR "Confusion" OR "Anger" OR "Aggression" OR "Affect" OR "Apathy" OR "Sadness" OR "Frustration" OR "Loneliness" OR "Sleep" OR "Insomnia" OR "Circadian Rhythm" OR "Conflict (Psychology)" OR "Injuries, Self-Inflicted" OR "Self-Injurious Behavior" OR "Delusions" OR "Social Isolation" OR "Quarantine" OR "Patient Isolation" OR "Emotions" OR "Psychological Trauma" OR "Suffering" OR "Hopelessness")</p>		<p>No filters or limitations applied.</p> <p>Subject Heading variations compared to PubMed’s MeSH are applied as per availability and recommendati on in CINAHL.</p>
<p><b>PsycInfo</b> (EBSCO)</p> <p><b>Coverage:</b> 1632-</p> <p><b>Search date:</b> 2020-04-17</p>	<p>(((TI ( depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR hypervigilance OR psychology OR fear OR fears OR panic* OR stress OR stressed OR PTSD OR suicid* OR nervous* OR confusion* OR confused OR angry OR anger* OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR “suffering” OR “suffer” OR misery OR miserable OR despair OR angst OR agony OR hopeless* OR hopeless* OR furious OR sleep* OR insomnia OR “circadian rhythms” OR “circadian rhythm” OR “biological rhythms” OR “biological rhythm” OR trauma* OR irritab* OR indignation* OR conflict* OR “self-injury” OR “self-harm” OR “self-harming” OR “self-mutilation” OR "self-mutilations" OR “self-Injurious” OR “self-destructive” OR automutilation OR “auto-mutilation” OR delusion* OR isolation* OR isolate* OR</p>	<p>9</p>	<p>All terms are searched in the fields: “title” and “abstract” (here marked with “TI and “AB”) and in the “thesaurus” (here marked with “DE”) when available.</p> <p>No filters or limitations applied.</p>

	<p>quarantine* OR “lock-down” OR lockdown OR “social-distancing” ) OR AB ( depression OR depressed OR depressive OR mental* OR psychiatr* OR psychological* OR psychosocial OR anxiety OR anxious OR anxieties OR hypervigilance OR psychology OR fear OR fears OR panic* OR stress OR stressed OR PTSD OR suicid* OR nervous* OR confusion* OR confused OR angry OR anger* OR aggress* OR rage OR rages OR mood OR moods OR worry* OR worries OR affect OR affects OR emotion* OR apathy OR apathetic OR distress* OR sad OR sadness OR anguish OR unhapp* OR frustrat* OR loneliness OR lonely OR “suffering” OR “suffer” OR misery OR miserable OR despair OR angst OR agony OR hopeless* OR hopeless* OR furious OR sleep* OR insomnia OR “circadian rhythms” OR “circadian rhythm” OR “biological rhythms” OR “biological rhythm” OR trauma* OR irritab* OR indignation* OR conflict* OR “self-injury” OR “self-harm” OR “self-harming” OR “self-mutilation” OR "self-mutilations" OR “self-Injurious” OR “self-destructive” OR automutilation OR “auto-mutilation” OR delusion* OR isolation* OR isolate* OR quarantine* OR “lock-down” OR lockdown OR “social-distancing”) OR (DE "Anger" OR "Aggressive Behavior" OR "Emotional Trauma" OR "Health Anxiety" OR "Irritability" OR "Apathy" OR "Distress" OR "Sadness" OR "Emotional Trauma" OR "Frustration" OR "Loneliness" OR "Sleep" OR "Insomnia" OR "Conflict" OR "Self-Injurious Behavior” OR “Delusions" OR "Social Isolation" OR "Emotions" OR "Fear" OR "Panic" OR "Stress" OR "Stress Reactions" OR "Post-Traumatic Stress" OR "Occupational Stress" OR "Suicide" OR "Attempted Suicide" OR "Suicidality" OR "Mental Confusion" OR "Major Depression" OR "Psychiatry" OR "Anxiety" OR "Psychology" OR "Deprivation" OR "Psychosocial Factors" OR "Depression (Emotion)" OR "Hopelessness") AND (TI ( “2019 novel coronavirus” OR “2019-ncov” OR “novel coronavirus 2019” OR “COVI-19” OR “2019 coronavirus” OR “COVID-19” OR “COVID-2019” OR "2019 coronavirus" OR “Wuhan coronavirus” OR “coronavirus disease 2019” OR ”coronavirus disease-19” OR “2019-nCoV” ) OR AB ( “2019 novel coronavirus” OR “2019-ncov” OR “novel coronavirus 2019” OR “COVI-19” OR “2019 coronavirus” OR “COVID-19” OR “COVID-2019” OR "2019 coronavirus" OR “Wuhan coronavirus” OR “coronavirus disease 2019” OR ”coronavirus disease-19” OR “2019-nCoV”))))))</p>	<p>Thesaurus variations compared to PubMed’s MeSH are applied as per availability and recommendati on in PsycInfo.</p>
<b>Total no. of records identified</b>		<b>3,233</b>
<b>Total no. of unique records identified</b>		<b>1,699</b>