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Abstract

The global COVID-19 pandemic has disrupted the lives of workers and taken its toll on health and well-being. In line with recent calls for more inductive and abductive occupational health science research, we exploratorily meta-analyzed workers' COVID-19 distress, defined as psychological and psychosomatic strain contextualized to experiencing the virus and pandemic broadly. We identified many existing COVID-19 distress measures (e.g., Fear of COVID-19 Scale by Ahorsu et al., 2020; Coronavirus Anxiety Scale by Lee, 2020a) and correlates, including demographic variables (viz., gender, marital status, whether worker has children), positive well-being (e.g., quality of life, perceived social support, resilience), negative well-being (e.g., anxiety, depression, sleep problems), and work-related variables (e.g., job satisfaction, burnout, task performance). Additionally, we found preliminary evidence of subgroup differences by COVID-19 distress measure and country-level moderation moderators (viz., cultural values, pandemic-related government response) as well as COVID-19 distress's incremental validity over and above anxiety and depression. The findings—based on $k = 135$ independent samples totaling $N = 61{,}470$ workers—were abductively contextualized with existing theories and previous research. We also call for future research to address the grand challenge of working during the COVID-19 pandemic and ultimately develop a cumulative occupational health psychology of pandemics.

Keywords: coronavirus, COVID-19, SARS-CoV-2, pandemic, fear, anxiety

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> Put simply, pandemics of infectious disease are not just events in which some infectious "bug" spreads throughout the world. Pandemics are events in which the population's psychological reactions to infection play an essential role in the spreading and containment of the disease, and influence the extent to which widespread emotional distress and social disorder occur. (Taylor, 2019, p. 2)

On March 11, 2020, the World Health Organization (WHO; 2020) declared the COVID-19 outbreak a global pandemic. This health crisis has been catastrophic vis-à-vis not only its death toll, but also its toll on mental health and well-being. Two and a half years after the WHO announcement, the pandemic remained a significant source of stress for 63% of U.S. adults (The Harris Poll & American Psychological Association, 2022). Because COVID-19 has impacted the lives of virtually every worker (Sinclair et al., 2020), an increased emphasis on understanding the pandemic through the lens of occupational health science is warranted. Some industrial-organizational psychology and occupational health psychology journals have dedicated special sections to work-related COVID-19 research (see, e.g., Andel et al., 2021; Bennett et al., 2021). Outside of these psychology subdisciplines, there already exist dozens of published meta-analyses involving workers' experiences amid the pandemic (see, e.g., Chutiyami et al., 2022). Whereas other meta-analysts focused on the prevalence of health professionals' general mental health symptoms, we conducted the first comprehensive psychometric meta-analysis of workers' *COVID-19 distress*, which we define as psychological and psychosomatic strain (e.g., anxiety, fear, obsessive thoughts, heart palpitations, sweaty palms) contextualized to the virus and pandemic. Notably, this conceptualization excludes non-COVID-19-specific mental

illness/distress experienced during the pandemic (see, e.g., Mahmud et al., 2021) and COVID-19's neuropsychiatric sequelae (e.g., "brain fog," dementia, psychosis; Boldrini et al., 2021; Ceban et al., 2022; Taquet et al., 2021; Xu et al., 2022). The latter do not require the experience of COVID-19 distress as defined; rather, they are cognitive decrements *resulting specifically from having contracted SARS-CoV-2*.

Consistent with calls for more inductive and abductive research from the inaugural issue of *Occupational Health Science* (see Sinclair, 2017; Spector, 2017), this meta-analysis is exploratory. Indeed, "there is no area of occupational health science . . . where we know so much that all we need are deductive confirmations of our theories" (Spector, 2017, p. 18). Although popular theories invoked in occupational health psychology (e.g., job demands–resources [JD–R] model; Bakker & Demerouti, 2017) could have guided this study, we leveraged meta-analysis, guided by research questions, to preliminarily evaluate the replicability of findings (see Sharpe & Poets, 2020) in this burgeoning research area, and we abductively identified relevant theories and past research.

Moreover, exploratory research is especially well suited for addressing *grand challenges* (e.g., global poverty, climate change), which are characterized by great societal importance, complexity, and uncertainty; such scenarios are particularly challenging due to limitations of existing theories (Eisenhardt et al., 2016). Certainly, COVID-19 and how individuals navigate and experience work during the pandemic are grand challenges, which can be addressed, in part, with occupational health science. In addition, grand challenges are global in scope, so country differences may have implications for tackling such challenges (see George et al., 2016). Thus, it would be insightful to explore whether relationships between COVID-19 distress and its correlates differ based on cultural values and pandemic-related government action.

During previous infectious disease outbreaks, such as the severe acute respiratory syndrome (i.e., SARS-CoV-1, SARS) outbreak of the early 2000s and the more recent Middle East respiratory syndrome (i.e., MERS) outbreaks, there had been very few efforts to study pandemic-related distress (for an exception, see Ho et al., 2005). Instead, researchers focused primarily on the mental health symptoms (e.g., depression, anxiety, obsessive compulsive disorder, post-traumatic stress) of healthcare professionals and patients (Dennis et al., 2021; McBride et al., 2020). In contrast, COVID-19 has fueled research interest in not only psychopathological symptoms, but also pandemic-related worries and fears. Although early COVID-19 researchers considered different strain constructs (e.g., fear, trauma) as if they were interchangeable, it is important to distinguish between COVID-19 distress and mental illness, which represent conceptually distinct parts of the stress-response experience (see Gouzman et al., 2022). For example, compared to depression, fear may be a more proximal outcome of pandemic-related stressors. Indeed, prolonged experience of fear and anxiety during a disease outbreak may develop into psychopathology (Taylor, 2021). What is missing from the literature is a quantitative synthesis and comparison of pandemic-related distress and its mental-health concomitants as experienced by not only healthcare professionals, but also other types of workers.

Additionally, "the psychology of pandemics is fragmented, encompassing numerous psychological subspecialties and allied disciplines. There is no unifying theory underlying the psychology of pandemics" (Taylor, 2021, p. 2.3). We embrace the literature's multidisciplinarity (e.g., medicine, psychology) and seek to contribute to the development of the *occupational health* psychology (OHP) of pandemics. But, before developing pandemic-specific OHP theories, it would be prudent to take stock of the state of COVID-19 distress research with

employed samples. In summary, clarifying what and how research is being conducted, assessing the generalizability of results, and comparing COVID-19 distress to popularly measured non-contextualized mental-health symptoms experienced by workers will be invaluable for the development of cumulative knowledge (see Schmidt, 1992) in the OHP of pandemics. To that end, we asked the following:

Research Question 1: What are the relationships between COVID-19 distress and its commonly studied correlates?

Research Question 2: Does the COVID-19 distress measure used moderate any of the relationships between COVID-19 distress and its correlates?

Research Question 3: Does industry (e.g., healthcare, education) moderate any of the relationships between COVID-19 distress and its correlates?

Research Question 4: Do country-level characteristics (e.g., culture, pandemic-related government response) moderate any of the relationships between COVID-19 distress and its correlates?

Research Question 5: Compared to other mental-health constructs (e.g., anxiety, depression), does COVID-19 distress exhibit incremental validity when explaining variance in correlates for which there is available meta-analytic information?

Method

Literature Search and Inclusion Criteria

Akin to the dynamic nature of the literature on COVID-19, we adopted a dynamic literature search strategy to adequately capture published, in-press, and pre-submission research. We first identified review articles (viz., Chandu et al., 2020; Cortez et al., 2020; Muller et al., 2021; Ransing et al., 2021) summarizing current COVID-19 distress measures. During summer–

winter 2021 and a supplemental search in spring 2022, we conducted forward searches for studies citing these measures' articles and limited our queries to literature (written in English) involving "employees," "professionals," or "workers." To make some searches more manageable (e.g., forward searches of Ahorsu et al.'s, 2020, Fear of COVID-19 Scale and Lee's, 2020a, Coronavirus Anxiety Scale), we specified additional terms (e.g., "correlation," "correlations"). Considering the burgeoning nature of COVID-19 research, we relied on Google Scholar for its up-to-date, comprehensive coverage (see Harari et al., 2020), which outperforms other popular academic search engines and databases (e.g., ProQuest, Web of Science; Gusenbauer, 2019; Martín-Martín et al., 2021). We also contacted presenters of relevant research identified in the 2021 conference programs of the Academy of Management; Association for Psychological Science; Society for Industrial and Organizational Psychology; and Work, Stress, and Health. Our literature searches yielded approximately 3,100 results for review. After excluding duplicates and irrelevant studies (e.g., conceptual articles, non-worker samples), our final meta-analytic database comprised $k = 135$ independent samples totaling $N = 61{,}470$ workers.

Coding and Meta-Analytic Procedures

After a practice coding session with an earlier iteration of the database, the first author and a coauthor coded 43 randomly selected effect sizes (representing 20% of effect sizes at the time). Interrater agreement was 93.60%. The first author resolved all coding discrepancies and coded all subsequent samples incorporated in the database.

We used Dahlke and Wiernik's (2019) R package *psychmeta* to conduct random-effects meta-analyses with effect sizes individually corrected for measurement error (see Schmidt & Hunter, 2015). When possible, we computed composite correlations and reliabilities (e.g., for studies with multiple COVID-19 distress measures). When composite component

intercorrelations were not reported, we averaged the corresponding correlations and/or reliabilities. If a primary study did not include reliability information (33% of all included samples), we imputed the corresponding database average (see Supplemental Tables 1–2). For single-item measures and sociodemographic variables, we coded $\alpha = 1.00$. Spearman correlations were converted to Pearson correlations (see Rupinski & Dunlap, 1996). To account for unequal group sizes, we used `psychmeta::correct_r_split()`, with `pa` set to .50, to disattenuate correlations involving a dichotomous variable (e.g., gender). Alternatively, if no correlation but relevant information was provided for these variables (e.g., group means and standard deviations, group sample sizes, *t* values, *t*-test *p* values), correlations were computed using Campbell Collaboration effect-size calculators (e.g., Wilson, n.d.) and then disattenuated in the manner described above. Additionally, we used R package *dominanceanalysis* (Bustos Navarrete & Coutinho Soares, 2020) to conduct dominance analyses incorporating relevant meta-analytic information we were able to identify (i.e., secondary uses of meta-analytic data [SUMAD]; Oh, 2020). Specifically, we were interested in leveraging previously cumulated information on workers' mental health in relation to important outcomes (e.g., the anxiety–burnout relationship; see Koutsimani et al., 2019). Integrating such estimates with our own in a meta-analytic correlation matrix allowed us to investigate the relative impact of COVID-19 distress compared to more general and frequently studied mental health constructs.

COVID-19 distress measure and industry were explored as categorical moderator variables for relationships that had more than one subgroup comprising at least seven samples[1] (*Z* tests were conducted to formally assess subgroup differences; see Raju & Brand, 2003).

[1] Although our original cutoff was $k \geq 3$, a reviewer recommended setting a higher threshold, such as $k \geq 10$; however, such a threshold would have limited our subgroup analysis to just examining COVID-19 distress measure as a moderator of gender differences. Having a threshold of $k \geq 7$ allowed us to make three subgroup comparisons including industry as a moderator.

Country and study timeframe[2] were coded to explore Hofstede et al.'s (2015) cultural values and the Oxford COVID-19 Government Response Tracker (OxCGRT) indices (see Hale et al., 2021) as continuous moderators, which were assessed using `psychmeta::metareg()`. We used Hofstede et al.'s (2015) data to code power distance, individualism (vs. collectivism), masculinity (vs. femininity), uncertainty avoidance, long-term (vs. short term) orientation, and indulgence (vs. restraint) for each study in which country of data collection was reported. Additionally, we used OxCGRT's (2021) date-specific values for the "containment and health" and "economic support" indices reported by country. The former indexes closure (e.g., school closings), containment (e.g., stay-at-home policies), and surveillance (e.g., testing, contact tracing) policies, whereas the latter indexes financial assistance (Hale, et al., 2021). Because OxCGRT information is reported daily, we coded index averages corresponding to study timeframe and country. See online Supplemental Materials for more details.

Results

In our database, 24 different measures of COVID-19 distress were used (see Table 1). The most popular measures were Ahorsu et al.'s (2020) Fear of COVID-19 Scale (FCV-19S; k = 83) and Lee's (2020a) Coronavirus Anxiety Scale (CAS; k = 24). Additionally, we identified 28 meta-analyzable COVID-19 distress correlates, which we categorized as demographics (age, children,[3] gender, marital status), positive well-being (general mental health/well-being, quality of life, perceived social support, resilience, trait mindfulness), negative well-being (anxiety, depression, stress, post-traumatic stress symptoms, psychological distress, sleep problems), and work-related variables (organizational tenure, professional tenure, perceived organizational

[2] In our database, the earliest study was conducted by Abdelghani et al. (2021) from March 1 – May 1, 2020, and the most recent study was conducted by Meredith (2022) in February 2022.
[3] In response to a reviewer's comment, we searched our database for samples including information pertaining to COVID-19 distress and whether workers had children.

support, job satisfaction, work engagement, burnout, job stress, job insecurity, work–nonwork conflict, self-rated task performance, self-rated organizational citizenship behavior, organizational turnover intention, professional turnover intention). Samples were also categorized according to industry: education, healthcare, manufacturing, non-education/non-healthcare service sector (e.g., retail, customer service, restaurant workers), and miscellaneous/unspecified.[4]

Zero-Order Correlations (Research Question 1) and Moderation by Measure, Industry (Research Questions 2–3), and Country-Level Characteristics (Research Question 4)

See Tables 2–5 for meta-analytic zero-order relationships between COVID-19 distress and its correlates. Given a subgroup threshold of $k = 7$ samples, we only report subgroup comparisons for age (viz., COVID-19 distress measure) and gender (viz., COVID-19 distress measure and industry) below. Interested readers can view Supplemental Tables 3–6 for comprehensive subgroup analyses and assessment of publication bias; however, because subgroups comprise as few as $k = 3$ studies, we urge caution when interpreting these supplemental analyses, which may be impacted by second-order sampling error. Additionally, see Supplemental Tables 7–10 for meta-regression results associated with continuous moderation of country-level characteristics. Given the small *k*s associated with some relationships (and thus limited *df*), the two continuous moderator groups were assessed in separate meta-regression models. For space considerations, 95% confidence intervals of correlations are not reported below, and only significant meta-regression results are reported below.

COVID-19 Distress and Demographics

[4] Due to their heterogenous nature, miscellaneous/unspecified samples were not included in subgroup comparisons.

COVID-19 distress was unrelated to age: $\bar{\rho}$ = .02 (k = 33). This relationship did not significantly differ across COVID-19 distress measures (see Table 2), but it was weakened by indulgence: b = -0.007 (p = .004). Whether workers had children was positively and weakly related to COVID-19 distress. Specifically, workers who had children experienced more COVID-19 distress compared to those without children: $\bar{\rho}$ = .13 (k = 9).

Gender was positively and weakly related to COVID-19 distress. Specifically, compared to men, women experienced more COVID-19 distress: $\bar{\rho}$ = .13 (k = 65). Additionally, although the relationship did not differ across education and healthcare samples, COVID-19 distress measure moderated the relationship such that it was stronger when involving the CAS ($\bar{\rho}$ = .18; k = 17) compared to the FCV-19S ($\bar{\rho}$ = .11; k = 30): Z = 5.37 (p < .001). Additionally, the gender difference was exacerbated by power distance (b = 0.004, p = .036), individualism (b = 0.003, p = .042), and uncertainty avoidance (b = 0.002, p = 0.021). Despite these significant b weights, note the lower bounds of their 95% CIs were near zero (expanded out to 0.0002, 0.0001, and 0.0003, respectively).

COVID-19 distress was positively and weakly related to marital status. Specifically, compared to unmarried workers, married workers experienced more COVID-19 distress: $\bar{\rho}$ = .07 (k = 27).

COVID-19 Distress and Positive Well-Being

COVID-19 distress was negatively and moderately related to general mental health/well-being: $\bar{\rho}$ = -.35 (k = 15). Power distance (b = 0.025, p < .001), individualism (b = 0.040, p < .001), masculinity (b = 0.094, p < .001), and uncertainty avoidance (b = 0.057, p < .001) weakened the relationship, whereas indulgence (b = -0.034, p < .001) strengthened it.

COVID-19 distress was also negatively and moderately related to quality of life ($\bar{\rho}$ = -.37; k = 7) and negatively and weakly related to perceived social support ($\bar{\rho}$ = -.16; k = 8). The relationship between COVID-19 distress and resilience was negative and moderate: $\bar{\rho}$ = -.33 (k = 15). Economic support strengthened the relationship: b = -0.005 (p = .025). Additionally, the relationship between COVID-19 distress and trait mindfulness was negative and moderate: $\bar{\rho}$ = -.31 (k = 5). Containment and health weakened this relationship (b = 0.015, p = .001), whereas economic support strengthened it (b = -0.004, p = .031). Despite the latter moderator's significant b weight, note the upper bound of its 95% CI was near zero (expanded out to -0.0003).

COVID-19 Distress and Negative Well-Being

COVID-19 distress was positively and strongly related to anxiety: $\bar{\rho}$ = .54 (k = 33). Economic support weakened the relationship: b = -0.003 (p = .009). COVID-19 distress was positively and moderately related to depression: $\bar{\rho}$ = .41 (k = 43). Economic support weakened the relationship: b = -0.004 (p = .003). Also, stress (measured with scales developed by Cohen et al., 1983, and Lovibond & Lovibond, 1995) was positively and moderately related to COVID-19 distress: $\bar{\rho}$ = .43 (k = 19).

COVID-19 distress was positively and moderately related to post-traumatic stress symptoms: $\bar{\rho}$ = .48 (k = 10). This relationship was exacerbated by economic support: b = 0.006, p = .001. COVID-19 distress was also positively and moderately related to Kessler et al.'s (2002) conceptualization of psychological distress: $\bar{\rho}$ = .48 (k = 4). Additionally, COVID-19 distress was positively and moderately related to sleep problems: $\bar{\rho}$ = .41 (k = 15). Uncertainty avoidance exacerbated this relationship: b = 0.004 (p = .044). Despite this significant b weight, note the lower bound of its 95% CI was near zero (expanded out to 0.0001).

COVID-19 Distress and Work-Related Variables

COVID-19 distress was unrelated to organizational tenure ($\bar{\rho}$ = .01; k = 7), professional tenure ($\bar{\rho}$ = .10; k = 8), and perceived organizational support (POS; $\bar{\rho}$ = .03; k = 3). In contrast, COVID-19 distress was negatively and weakly related to job satisfaction: ($\bar{\rho}$ = -.14; k = 9). This relationship was strengthened by economic support: b = -0.008 (p = .008). In addition, although COVID-19 distress was unrelated to work engagement ($\bar{\rho}$ = -.22; k = 3), it was positively and moderately related to burnout ($\bar{\rho}$ = .37; k = 16). Containment and health weakened this relationship (b = -0.015, p = .030).

COVID-19 distress was positively and moderately related to job stress ($\bar{\rho}$ = .38; k = 8), job insecurity ($\bar{\rho}$ = .45; k = 8), and work–nonwork conflict ($\bar{\rho}$ = .43; k = 8). Regarding self-rated job performance, COVID-19 distress was negatively and moderately related to task performance ($\bar{\rho}$ = -.31; k = 4) but unrelated to organizational citizenship behavior (OCB; $\bar{\rho}$ = -.02; k = 4). Additionally, COVID-19 distress was positively and weakly related to organizational turnover intention ($\bar{\rho}$ = .27; k = 10) and professional turnover intention ($\bar{\rho}$ = .25; k = 4).

Dominance Analyses Comparing COVID-19 Distress, Anxiety, and Depression (Research Question 5)

Through SUMAD, we leveraged previous meta-analyses and metaBUS (Bosco et al., 2020) to conduct dominance analyses comparing COVID-19 distress, anxiety, and depression as predictors of sleep problems (see Litwiller et al., 2017), burnout (see Koutsimani et al., 2019; Meier & Kim, 2022), work engagement (from metaBUS), job satisfaction (see Faragher et al., 2005), task performance (see Ford et al., 2011, which we supplemented with metaBUS), and

OCB (from metaBUS).[5] These particular correlates were selected because they are important worker well-being and performance constructs in their own right—as evidenced by their appearance in our literature search and the highly cited meta-analyses we incorporated as SUMAD. Because we could not identify any meta-analysis of the anxiety–depression relationship among workers, we relied on metaBUS to identify relevant studies for estimating this relationship. Using these SUMAD sources and our estimates of COVID-19 distress correlations, we compiled a matrix of correlations weighted by sample size and corrected for measurement error (see Supplemental Table 12). This matrix along with relationship-specific harmonic means served as input for our meta-analytic dominance analyses. For more information, including detailed results of these analyses, see online Supplemental Materials.

When predicting sleep problems (R^2 = .25), COVID-19 distress (coefficient = .24, average contribution to R^2 = .09, average %R^2 = 35.29) and anxiety (coefficient = .22, average contribution to R^2 = .09, average %R^2 = 37.53) completely dominated depression (coefficient = .13, average contribution to R^2 = .07, average %R^2 = 27.18). Anxiety generally dominated COVID-19 distress. Depression did not exhibit dominance.

When predicting burnout (R^2 = .50), COVID-19 distress (coefficient = .07, average contribution to R^2 = .05, average %R^2 = 9.68) did not exhibit dominance. Anxiety (coefficient = .11, average contribution to R^2 = .16, average %R^2 = 31.96) completely dominated COVID-19 distress. Depression (coefficient = .59, average contribution to R^2 = .29, average %R^2 = 58.36) completely dominated the two other variables.

We were unable to leverage SUMAD for the relationship between work engagement and anxiety. When predicting work engagement (R^2 = .08), COVID-19 distress (coefficient = -.15,

[5] Due to rounding, the average contributions to work engagement's and task performance's R^2s explained by COVID-19 distress and its covariates do not perfectly sum to their respective R^2s.

average contribution to R^2 = .03, average %R^2 = 43.90) did not exhibit dominance. Depression (coefficient = -.18, average contribution to R^2 = .04, average %R^2 = 56.10) completely dominated COVID-19 distress.

When predicting job satisfaction (R^2 = .21), COVID-19 distress (coefficient = .12, average contribution to R^2 = .01, average %R^2 = 5.59) did not exhibit dominance. Anxiety (coefficient = -.28, average contribution to R^2 = .10, average %R^2 = 46.28) and depression (coefficient = -.26, average contribution to R^2 = .10, average %R^2 = 48.13) completely dominated COVID-19 distress. Depression generally dominated anxiety.

When predicting task performance (R^2 = .10), COVID-19 distress (coefficient = -.25, average contribution to R^2 = .07, average %R^2 = 63.80) completely dominated the two other variables. Anxiety (coefficient = -.15, average contribution to R^2 = .03, average %R^2 = 27.19) completely dominated depression (coefficient = .06, average contribution to R^2 = .01, average %R^2 = 9.01). Depression did not exhibit dominance.

When predicting OCB (R^2 = .21), COVID-19 distress (coefficient = .09, average contribution to R^2 = .01, average %R^2 = 3.37) did not exhibit dominance. Anxiety (coefficient = .30, average contribution to R^2 = .03, average %R^2 = 15.51) and depression (coefficient = -.65, average contribution to R^2 = .17, average %R^2 = 81.12) completely dominated COVID-19 distress. Depression completely dominated both variables.

Discussion

Below, we discuss several key insights and corresponding directions for future research (see Table 6 for summary). We also discuss practical implications relevant to not only the ongoing COVID-19 pandemic, but also future disease outbreaks.

Workers' COVID-19 Distress Has Many Meaningful Correlates

Demographic Variables

The nonsignificant relationship between age and COVID-19 distress is inconsistent with socioemotional selectivity theory, which posits that aging is associated with improved emotion regulation (e.g., lower reactivity to stressors); however, according to the strength and vulnerability integration (SAVI) model, in the presence of prolonged, inescapable stressors, there may be no age-related differences in emotion regulation (Carstensen et al., 2020). Given that the COVID-19 pandemic is ongoing and global—and thus prolonged and inescapable—perhaps this null result is unsurprising in the context of the SAVI model. Examples of future research directions include identifying age-related advantages and disadvantages associated with working during pandemics (e.g., whether age moderates relationships between COVID-19 distress and worker well-being—and, if so, why?) and the degree to which pandemic-related distress plays a role in decisions to remain in the workforce or retire.

Generally, compared to men, women experience slightly more COVID-19 distress. This finding mirrors the broader psychological literature consistently documenting gender differences in fear and anxiety (see McLean & Anderson, 2009). Nevertheless, more research is needed to illuminate the specific nature of this gender difference (e.g., are there gender differences when perceiving COVID-19's economic-related threats as distinguished from health-related threats; see, e.g., Gustafson, 1998) and whether this gender difference has implications for pandemic-related behaviors (Galasso et al., 2020).

Generally, compared to single workers and nonparents, married workers and those with children experience slightly more COVID-19 distress. Although marriage and parenthood can be rewarding, they also can be challenging (Hsu & Barrett, 2020; Nomaguchi & Milkie, 2020). From a social integration and social control perspective, family ties involve perceived

responsibility and obligation (Umberson, 1987). Perhaps married workers and working parents tend to experience more COVID-19 distress because they are worried about not only their health, but also that of their spouses and children. Undoubtedly, more research is needed to contextualize these findings (e.g., does number or age of children make a difference? Do unmarried workers in committed romantic relationships also experience more distress?) and investigate pandemic-related distress in other interpersonal contexts (e.g., workers in multigenerational households, shared housing).

Well-Being

Workers' COVID-19 distress is significantly related to all domain-unspecific (i.e., not contextualized to work) well-being constructs considered in the present study. On average, COVID-19 distress is moderately related to both positive and negative well-being. Relatedly, negative associations between positive and negative well-being constructs, as well as positive intercorrelations among negative well-being constructs, have been found in organizational research (e.g., Cole et al., 2012; Jimenez et al., 2022). Such relationships are perhaps unsurprising, so the literature would benefit from more nuanced examinations of relationships between workers' pandemic-related distress and well-being. For example, it may be important to control for neuroticism, extraversion, and/or conscientiousness, which are especially important trait predictors of well-being (Anglim et al., 2020). Additionally, given our finding that workers' COVID-19 distress also predicts future mental health/well-being, targeted intervention research is needed to determine how best to protect against the deleterious psychological impact of the ongoing pandemic and future pandemics.

Work-Related Variables

Notwithstanding *k*s ≤ 4 for relationships with these correlates, COVID-19 distress is unrelated to organizational and professional tenure, POS, work engagement, and OCB. Like age, organizational and professional tenure are proxies for experience, which benefits emotion regulation (Bohlmann et al., 2021). Yet, just as we reasoned above, the prolonged, all-encompassing nature of the ongoing pandemic may nullify such an effect. In addition, according to the JD–R model, demands and resources are implicated in two independent pathways: a health-impairment pathway and a motivational pathway, respectively (Bakker & Demerouti, 2017). From this perspective, POS (a job resource) and work engagement (a motivational construct) are not as relevant to the experience of COVID-19 distress (a strain outcome). Interestingly, the null relationship between COVID-19 distress and OCB is inconsistent with recent meta-analytic evidence indicating a negative relationship between state negative affect and OCB (Geiger et al., 2019). But, it is possible that the null relationship we observed may be attributable to our conceptualization of COVID-19 distress not being limited to affective strain and/or discrete emotions differing in their associations with job performance (see, e.g., Hu & Kaplan, 2015). Given 80% credibility intervals including zero and small *k*s precluding subgroup comparisons, the literature would benefit from investigations into whether there exist boundary conditions under which COVID-19 distress is related to the above work-related variables.

In contrast, COVID-19 distress is associated with many constructs commonly measured in OHP. Specifically, COVID-19 distress is significantly related to job satisfaction (-), burnout (+), job stress (+), job insecurity (+), work–nonwork conflict (+), task performance (-), and organizational and professional turnover intention (+). These relationships underscore the importance of considering the "whole person"—and not exclusively work-related experiences—when studying worker well-being (Danna & Griffin, 1999) and the relevance of OHP theories in

the context of COVID-19 distress. For example, from the perspective of the work–home resources (W–HR) model (ten Brummelhuis & Bakker, 2012), COVID-19 distress—even if not associated with one's job (e.g., being a fully remote worker and thus not fearing contracting the disease at work)—depletes mental resources. In turn, a worker may inadequately cope with job-related stressors (e.g., job insecurity, work–nonwork conflict) and also experience increased strain (e.g., increased burnout, worsened task performance, increased turnover intentions). Simultaneously investigating—via structural equation modeling or path analysis—COVID-19 distress alongside the aforementioned work-related correlates would enable researchers to begin assessing whether the emerging OHP of pandemics can readily incorporate/extend existing OHP theories or whether new theories must be developed.[6]

COVID-19 Distress Measure Matters

When it comes to measuring COVID-19 distress, OHP researchers and practitioners have many options. Although the FCV-19S and CAS were the two most popular measures, we identified 24 different COVID-19 distress measures in our database. Despite the preponderance of COVID-19 distress measures and moderation by measure, just over two thirds (19/28) of the overall zero-order meta-analytic correlations had 80% credibility intervals excluding zero (see Supplemental Tables 3–6). This finding would be consistent with the existence of an overarching COVID-19 distress construct. Nevertheless, measure meaningfully moderated the relationship between COVID-19 distress and gender—with CAS exacerbating gender differences more so than the FCV-19S. Compared to the FCV-19S, the CAS focuses more on psychosomatic strain. This finding is consistent with previous meta-analytic work demonstrating that, in general, women report more somatic symptoms (see Barsky et al., 2001). We encourage researchers and

[6] Due to the largely cross-sectional nature of meta-analyzed samples, we did not conduct meta-analytic structural equation modeling.

practitioners to think about their particular measurement needs and review the measures and item examples in Table 1. Relatedly, it will be important for organizational researchers to conduct studies on the construct validity of the aforementioned conceptualizations and measures. Such efforts will help identity additional measure-based moderation effects. Table 1, however, is not all-encompassing, and researchers and practitioners may want to consider newly emerging conceptualizations of pandemic-related distress. For example, given how long COVID-19 has lasted, OHP researchers and practitioners may be interested in assessing workers' pandemic fatigue and apathy (see, e.g., Lilleholt et al., 2022; Taylor et al., 2022). These manifestations of COVID-19 distress may have unique implications for occupational safety and disease spread in the workplace. Overall, the OHP and broader psychology of pandemics would benefit from further conceptual development and refinement of pandemic-related distress constructs and measures.

Relatedly, although we focused on *COVID-19* distress, we believe this meta-analysis provides a first glimpse into the ramifications of workers' *pandemic-related* distress more broadly. We acknowledge, however, that more research is needed to determine whether our findings are truly generalizable to other disease outbreaks, which may be qualitatively different. For example, compared to COVID-19, the SARS and MERS outbreaks did not result in lockdowns that were as globally widespread, and researchers largely focused on the impact on healthcare workers and patients (Dennis et al., 2021; McBride et al., 2020). Although researchers studying other disease outbreaks can consider adapting the wording of existing COVID-19 distress measures, the SAVE-6, despite being validated during the current pandemic, was developed to be used during any viral epidemic.

More Evidence of Industry's Role as a Moderator Is Needed

We were only able to meaningfully assess industry as a moderator for the relationship between COVID-19 distress and workers' gender, and the relationship did not differ across education and healthcare samples. Our supplemental subgroup analyses, however, revealed preliminary evidence of some industry differences (e.g., COVID-19 in relation to anxiety and depression; see Supplemental Table 5). Relatedly, previous meta-analytic evidence suggests that the mental health toll of COVID-19 is not equal across industries (e.g., education and healthcare; cf. Mahmud et al., 2021; Ozamiz-Etxebarria et al., 2021). Nevertheless, more cross-occupational research must be conducted before strong conclusions can be made about the generalizability of COVID-19 distress's impact across different types of workers. When a critical mass of studies is achieved, meta-analysts will be able to offer more nuanced insights on the differential impact of pandemic-related distress within industries (e.g., nurses compared to physicians, K–12 teachers compared to college professors) and across industries (e.g., healthcare, education, foodservice). In the meantime, researchers can also consider conducting measurement equivalence/invariance testing and/or multigroup structural equation modeling to directly assess industry/profession as a boundary condition in primary studies.

Preliminary Evidence Highlights the Potential Relevance of Country-Level Moderators

Cultural dimensions moderated the strength of some correlations. For example, power distance, individualism, and uncertainty avoidance weakened the negative relationship between COVID-19 distress and mental health/well-being but exacerbated the gender difference in COVID-19 distress. In other words, we found that the mental health/well-being of individuals in countries exhibiting the above dimensions seems to be more resilient to the deleterious impact of COVID-19 distress, but women's experience of COVID-19 distress is even greater relative to

men's experience in such countries. Such findings add to Lieven's (2021) recent study reporting relationships between nation-level CAS scores and Hofstede's cultural dimensions.

The OxCGRT indices also moderated the strength of several correlations. The more economic support a sample's country instituted during data collection, the weaker the associations between COVID-19 distress and anxiety and depression and the stronger the associations between COVID-19 distress and resilience, trait mindfulness, post-traumatic stress and job satisfaction. Perhaps countries are likely to offer greater financial assistance when their workforces experience elevated levels of job dissatisfaction and post-traumatic stress amid a pandemic. In contrast, perhaps greater financial assistance also helps alleviate discrete mental-health issues resulting from COVID-19 distress and augments mindfulness and resilience's protection against COVID-19 distress. Moreover, the more containment and health policies a sample's country enacted during data collection, the weaker the associations between COVID-19 distress and trait mindfulness and burnout. In other words, although such policies may reduce mindfulness's protection against COVID-19 distress, they also may protect against COVID-19 distress developing into burnout. Perhaps during lockdowns, it is more difficult to be effectively mindful, but not having to commute to work during such periods may alleviate concerns about catching the virus at work—rendering COVID-19 distress less relevant to experiencing burnout.

It is important to note, however, that these findings should be cautiously interpreted because the corresponding meta-regression models have small *k*s and much unaccounted variance. Therefore, rather than overstate these findings, we surmise that country-level moderators broadly play a role in the OHP of pandemics. Additionally, it is also possible that cultural values predict pandemic-related government responses. When more COVID-19 distress research accumulates, meta-analysts can reexamine the aforementioned continuous moderators

simultaneously—perhaps with machine learning (e.g., random forests) to identify which moderators are the most important when considered simultaneously (see van Lissa, 2020). We also encourage researchers to incorporate multilevel and multigroup designs and account for country-level variables in primary studies.

Preliminary Evidence Suggests Some Incremental Validity of COVID-19 Distress

The meta-analytic dominance analyses suggest that when simultaneously considering workers' COVID-19 distress, anxiety, and depression, COVID-19 distress explains unique variance in two variables: sleep problems and self-reported task performance. When predicting sleep problems, COVID-19 distress and anxiety explained more variance than did depression. This finding—considered alongside COVID-19 distress's relatively stronger relationship with anxiety versus depression—is consistent with a recent meta-analysis suggesting that the link between anxiety-related disorders and sleep problems is independent of depressive symptoms (Cox & Olatunji, 2020).

For task performance, COVID-19 distress exhibited incremental validity over and above the anxiety and depression. Such a finding is consistent with conservation of resources theory, which highlights the negative impact loss of particularly valued resources has on job performance (Hobfoll et al., 2018). Compared to depression and anxiety, which are more general and multidetermined in nature, pandemic-related distress involves reflecting on potential threats to salient resources including personal health and the health of one's family. Such specific concerns may be especially taxing to cognitive resources and motivation and, thus, especially disruptive to handling job responsibilities.

In light of some small *k*s in the correlation matrix serving as input for the meta-analytic dominance analyses (see Supplemental Table 12), we reiterate that these findings are *preliminary*

in nature. We encourage occupational health researchers to continue incorporating more well-being (especially positive well-being) and work-related constructs in their primary studies on COVID-19 distress and to conduct more targeted meta-analyses of worker well-being. Such efforts will be helpful for future reassessments of the above relationships and additional dominance analyses later in the pandemic and during other disease outbreaks.

Practical Implications

We urge employers, leaders, and practitioners to heed the pandemic's deleterious impact on workers. We observed that work–nonwork conflict is positively and moderately related to COVID-19 distress, which is also linked to important OHP outcomes, including job satisfaction, burnout, and task performance. Relatedly, meta-analytic evidence indicates that family-supportive policies negatively relate to work-to-family conflict, which is also associated with the aforementioned OHP outcomes (Amstad et al., 2011; Butts et al., 2013). Additionally, preliminary evidence suggests that worker satisfaction with their organization's response to COVID-19 is negatively related to COVID-19 distress and indirectly related to both well-being and performance through work–life balance (see Ortiz-Bonnin et al., 2022). Thus, employers should ensure that family-friendly policies are available to workers and tailored to pandemic-related needs (e.g., childcare support, paid leave to care for family members with COVID-19; Daniels et al., 2022). Doing so should reduce work–nonwork conflict, quell some pandemic-related concerns, and improve overall functioning at work.

Some meta-regression findings may also have practical relevance. For example, policymakers should expeditiously provide the populace with financial assistance and support during a pandemic's most dire periods—as doing so may reduce the likelihood of COVID-19 distress developing into psychopathology. In addition, consultants should consider their clients'

cultural contexts, which may impact reactions to pandemic-era change management efforts (e.g., a multinational workforce's potentially varied reactions to return-to-office policies). We reiterate that the above moderator findings are preliminary; thus, their veracity should be reevaluated as the literature on COVID-19 distress matures.

Findings from our dominance analyses may also be relevant to organizations. In some instances, we found that COVID-19 distress, anxiety, and depression combined explained substantial variance (e.g., burnout $R^2 = .50$). Thus, although addressing pandemic-specific concerns is important, employers should also support their workers' general mental-health needs. For example, employers can provide and encourage the use of quality employee assistance programs and combat the stigma of mental illness in the workplace (Follmer & Jones, 2018) during tumultuous times. Additionally, rather than focus on treating symptoms, practitioners can protect workers' mental health by proactively identifying and mitigating pandemic-related occupational stressors (e.g., increased workload, inadequate personal protective equipment; Muller et al., 2020).

Limitations

The most notable limitation of the present study is the largely cross-sectional and common-source nature of the examined relationships (see Podsakoff et al., 2003). The correlations with job performance were especially problematic due to their self-reported nature. Moreover, causal inferences should not be made with cross-sectional data. For example, without rigorous longitudinal (e.g., cross-lagged) or experimental (stress-management interventions) studies, it is uncertain whether COVID-19 distress causes burnout, burnout causes COVID-19 distress, or some third confounding variable causes both constructs and renders their correlation spurious. In addition, some analyses (e.g., relationships involving job performance) were based

on small *k*s. As such, second-order sampling error may be present—distorting the true distribution of meta-analytic estimates (Schmidt et al., 2017). Also due to few samples, results of our exploratory meta-regressions assessing continuous moderation should be interpreted with caution (see Schmidt, 2017).

Additionally, there was reviewer concern about incorporating pre-pandemic SUMAD. For example, perhaps burnout, depression, and anxiety relate differently to each other during a pandemic. But, while building the meta-analytic correlation matrix for our dominance analyses, we were unable to rely exclusively on our own database due to the paucity of information on relationships between mental health and outcomes in the cumulated studies. For example, of the nine studies contributing to our meta-analytic estimate of the relationship between COVID-19 distress and job satisfaction, only Rice et al. (2021) reported correlations for job satisfaction in relation to depression and anxiety. In contrast, Faragher et al.'s (2005) meta-analytic estimates of job satisfaction's relationships with depression and anxiety are based on $k = 46$ and 60 samples, respectively. Integrating larger, extant meta-analytic databases for SUMAD reduces not only redundant research efforts, but also second-order sampling error (Park et al., 2020). Moreover, searching for pandemic-era studies of general mental health constructs in relation to each other and the outcomes of interest would have been well beyond the scope of the present study. Such studies predate the development of COVID-19 distress measures and, thus, constitute a much larger literature to synthesize (see, e.g., Chutiyami et al., 2022). We encourage other researchers to conduct such a meta-analysis to determine whether such relationships indeed differ during a global pandemic. Overall, the literature on workers' COVID-19 distress and the broader OHP of pandemics would benefit from the accumulation of more research—especially experimental, time-lagged, multisource, and international studies.

Conclusion

This study is the first comprehensive meta-analysis of workers' COVID-19 distress, which is a nascent yet burgeoning research area. We exploratorily identified many measures and correlates of COVID-19 distress—as well as several moderators—and contextualized our findings with existing theory and past research. Although we focused on COVID-19 distress, we hope this work encourages occupational health researchers and practitioners to seriously consider protecting workers from the deleterious impact of pandemic-related distress during this pandemic and future disease outbreaks. Although much work remains, we can confidently conclude that employers should not dismiss workers' fears, worries, and concerns surrounding pandemics. Let us strive to systematically address the grand challenge of working during the era of COVID-19 and develop a cumulative OHP of pandemics.

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Table 1

COVID-19 Distress Measures Implemented in Database Samples

k	Measure	Item example(s) or description (in italics)
24	Coronavirus Anxiety Scale (CAS, Lee, 2020a)	• I felt dizzy, lightheaded, or faint, when I read or listened to news about the coronavirus. • I felt nauseous or had stomach problems when I thought about or was exposed to information about the coronavirus.
1	Coronavirus Impacts Questionnaire: psychological scale (Conway et al., 2020)	• I have become depressed because of the Coronavirus (COVID-19). • The Coronavirus (COVID-19) outbreak has impacted my psychological health negatively.
4	COVID Stress Scales (CSS, Taylor et al., 2020)	• I had trouble concentrating because I kept thinking about the virus. • Reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart.
8	COVID-19 Phobia Scale (C19P-S, Arpaci et al., 2020)	• News about coronavirus-related deaths causes me great anxiety. • I experience serious chest pain out of the fear of coronavirus.
1	COVID-19 related psychological distress in healthy public (CORPD; Feng et al., 2020) scale: anxiety and fear	• I'm afraid to travel to places hard-hit by COVID. • When I see an increase in the number of COVID-19 patients on the news, I feel anxious.
1	COVID-19 Worry Questionnaire (CWQ, Vujanovic & Lebeaut, 2020)	• How worried were you about being infected with COVID-19? • How worried were you about infecting others with COVID-19?
2	De Clercq et al.'s (2021) Study 1 fear of COVID-19 items (adapted De Clercq et al., 2020)	• I worry that COVID-19 will only get worse as time passes. • I think that I am completely helpless in protecting myself from COVID-19 in the future.
1	Dehon et al.'s (2021) fear of COVID-19 infection items (adapted Ho et al., 2005)	• *See Ho et al. (2005).*
1	Dimoff et al.'s (2021) adaptation of Kelloway et al.'s (2012) fear of future contamination items	• *See Kelloway et al. (2012).*
1	Fear of COVID-19 Familial Infection Scale (FCFI, Mayer et al., 2021): fear of infecting others	• I am afraid to infect my children with the coronavirus-19. • I am afraid to infect my partner with the coronavirus-19.

k	Measure	Item example(s) or description (in italics)
83 [a]	Fear of COVID-19 Scale (FCV-19S, Ahorsu et al., 2020)	• My hands become clammy when I think about coronavirus-19. • I am afraid of losing my life because of coronavirus-19.
1	Fear of COVID-19 Scale (FOC-6; Dymecka et al., 2022)	• I am afraid of serious health complications due to coronavirus infection (e.g., permanent lung damage). • I am afraid that I will be isolated from my family and friends due to the pandemic.
1	Fonseca et al.'s (2021) COVID-19 fear items	• *Items capture COVID-19-related fear, such as fear of contracting the virus and fear of infecting others.*
1	Hebles et al.'s (2022) adaptation of a single item developed by the United Kingdom Office for National Statistics (2020)	• How worried or unworried are you about the effect that COVID-19 is having on your life right now?
1	Latif et al.'s (2021) fear items	• I am afraid of spreading the infection to my family, which made me move out or isolate myself. • I fear a second wave of COVID-19.
4	Obsession with COVID-19 Scale (OCS; Lee, 2020b)	• I had disturbing thoughts that I may have caught the coronavirus. • I could not stop thinking about the coronavirus.
1	Perceived Coronavirus Threat Questionnaire (Conway et al., 2020)	• Thinking about the coronavirus (COVID-19) makes me feel threatened. • I am afraid of the coronavirus (COVID-19).
1	Rice et al.'s (2021) COVID-19 risk perception items	• *Items capture worry about contracting the virus at work and infecting others.*
1	Sasaki et al.'s (2020) single-item global fear and worry about COVID-19	• Do you feel anxiety about COVID-19?
1	Stevenson-Street et al.'s (2021) fear of COVID-19 items (adapted Simard & Savard, 2009)	• I feel that I worry excessively about COVID-19.

k	Measure	Item example(s) or description (in italics)
8	Stress and Anxiety to Viral Epidemics-6 Items (SAVE-6) Scale (Chung, Ahn, et al., 2021) [b]	• Are you afraid the virus outbreak will continue indefinitely? • Do you worry your family or friends may become infected because of you?
1	Yen et al.'s (2022) emotional responses to COVID-19	• I feel anxious or fearful about the impact of the pandemic. • I am afraid that I have fever, cough, and other symptoms.
1	Yıldırım et al.'s (2020) coronavirus fear items	• I am frightened by coronavirus. • I am very concerned about catching coronavirus.
2	Zhong et al.'s (2021) death anxiety items (adapted Belmi & Pfeffer, 2016)	• Thoughts about the COVID-19 pandemic have made me feel anxious about my own mortality.

Note. *k* = number of database samples in which the measure was incorporated.

[a] Blekas et al (2020) used three items that were ultimately excluded from the FCV-19S during its development. For Blekas et al., we meta-analyzed the item "I worry a lot about coronavirus-19" in relation to gender and post-traumatic stress symptoms. [b] The SAVE-6 Scale includes six items from the Anxiety About the Pandemic factor of Chung, Kim, et al.'s (2021) Stress and Anxiety to Viral Epidemics-9 (SAVE-9) Scale. The SAVE-9 Scale's other three items (e.g., "Do you think that your colleagues would have more work to do due to your absence from a possible quarantine and might blame you?" Chung, Kim, et al., 2021, p. 6) constitute a second factor labeled Work-Related Stress Associated With the Viral Epidemic (i.e., SAVE-3), which we did not consider in the present meta-analysis.

Table 2

Meta-Analytic Results: Demographics

Meta-analysis	*k*	*N*	$\bar{r}$	$\bar{\rho}$	SD_ρ	%Var	95% CI		80% CrI		*Z* [a]
							Lower	Upper	Lower	Upper	
Age	33	12,658	.02	.02	0.19	7.29	-0.05	0.09	-0.24	0.27	$Z_{\text{CAS vs. FCV-19S}}$ = -0.78
CAS	7	2,254	-.03	-.04	0.25	5.11	-0.27	0.20	-0.40	0.32	
FCV-19S	16	6,560	.06	.06	0.23	5.23	-0.06	0.18	-0.24	0.36	
Children [b]	9	4,039	.13	.13	0.10	19.38	0.05	0.22	-0.01	0.27	
Gender [c]	65	36,933	.12	.13	0.08	22.39	0.11	0.15	0.02	0.24	$Z_{\text{Education vs. Healthcare}}$ = -0.64
Education	9	5,668	.12	.12	0.13	9.88	0.02	0.22	-0.05	0.30	$Z_{\text{CAS vs. FCV-19S}}$ = 5.37
Healthcare	39	21,577	.12	.13	0.08	23.72	0.10	0.16	0.03	0.24	
CAS	17	9,202	.16	.18	0.11	14.00	0.11	0.24	0.02	0.33	
FCV-19S	30	20,658	.10	.11	0.07	26.02	0.08	0.14	0.02	0.20	
Marital status [d]	27	12,867	.07	.07	0.10	18.64	0.03	0.12	-0.06	0.21	

Note. *k* = number of studies contributing to meta-analysis; *N* = total sample size; $\bar{r}$ = mean sample-size-weighted correlation; $\bar{\rho}$ = mean true-score correlation corrected for unreliability in COVID-19 distress and the correlate; SD_ρ = standard deviation of $\bar{\rho}$; %Var = percentage of variance attributable to artifacts; CI = confidence interval around $\bar{\rho}$; CrI = credibility interval around $\bar{\rho}$; CAS = Coronavirus Anxiety Scale (Lee, 2020a); FCV-19S = Fear of COVID-19 Scale (Ahorsu et al., 2020)

[a] When computing *Z* scores (see Raju & Brand, 2003), negative signs were omitted so that relationship strength was compared. $Z > |1.96|$ = significant (two-tailed $p < .05$). [b] Having children coded as higher. [c] Women coded as higher. [d] Married coded as higher.

Table 3

Meta-Analytic Results: Positive Well-Being

Meta-analysis	*k*	*N*	$\bar{r}$	$\bar{\rho}$	SD_ρ	%Var	95% CI		80% CrI	
							Lower	Upper	Lower	Upper
Mental health/well-being	15	8,297	-.29	-.35	0.10	18.32	-0.41	-0.28	-0.48	-0.21
Quality of life	7	1,984	-.33	-.37	0.16	11.76	-0.53	-0.21	-0.61	-0.14
Perceived social support	8	3,727	-.15	-.16	0.15	9.67	-0.30	-0.03	-0.38	0.05
Resilience	15	5,648	-.29	-.33	0.16	9.80	-0.42	-0.23	-0.55	-0.11
Trait mindfulness	5	1,501	-.28	-.31	0.15	13.87	-0.51	-0.11	-0.54	-0.08

Note. *k* = number of studies contributing to meta-analysis; *N* = total sample size; $\bar{r}$ = mean sample-size-weighted correlation; $\bar{\rho}$ = mean true-score correlation corrected for unreliability in COVID-19 distress and the correlate; SD_ρ = standard deviation of $\bar{\rho}$; %Var = percentage of variance attributable to artifacts; CI = confidence interval around $\bar{\rho}$; CrI = credibility interval around $\bar{\rho}$.

Table 4

Meta-Analytic Results: Negative Well-Being

Meta-analysis	*k*	*N*	$\bar{r}$	$\bar{\rho}$	SD_ρ	%Var	95% CI		80% CrI	
							Lower	Upper	Lower	Upper
Anxiety	33	10,396	.47	.54	0.15	9.90	0.48	0.59	0.34	0.74
Depression	43	14,907	.36	.41	0.15	11.67	0.37	0.46	0.22	0.60
Stress [a]	19	4,022	.37	.43	0.19	11.15	0.33	0.53	0.17	0.69
Post-traumatic stress symptoms	10	5,190	.44	.48	0.19	4.04	0.34	0.62	0.22	0.75
Psychological distress [b]	4	2,346	.43	.48	0.09	16.40	0.33	0.63	0.34	0.62
Sleep problems	15	6,431	.36	.41	0.06	40.34	0.37	0.46	0.34	0.49

Note. *k* = number of studies contributing to meta-analysis; *N* = total sample size; $\bar{r}$ = mean sample-size-weighted correlation; $\bar{\rho}$ = mean true-score correlation corrected for unreliability in COVID-19 distress and the correlate; SD_ρ = standard deviation of $\bar{\rho}$; %Var = percentage of variance attributable to artifacts; CI = confidence interval around $\bar{\rho}$; CrI = credibility interval around $\bar{\rho}$.

[a] Measured using the Depression Anxiety Stress Scales (see Lovibond & Lovibond, 1995) and the Perceived Stress Scale (see Cohen et al., 1983). [b] Assessed with measure of psychological distress developed by Kessler et al. (2002).

Table 5

Meta-Analytic Results: Work-Related Variables

Meta-analysis	*k*	*N*	$\bar{r}$	$\bar{\rho}$	SD_ρ	%Var	95% CI		80% CrI	
							Lower	Upper	Lower	Upper
Organizational tenure	7	1,866	.01	.01	0.09	36.72	-0.09	0.11	-0.11	0.14
Professional tenure	8	2,203	.09	.10	0.15	15.11	-0.04	0.23	-0.12	0.31
Perceived organizational support	3	943	.03	.03	0.20	8.96	-0.49	0.56	-0.35	0.42
Job satisfaction	9	3,660	-.13	-.14	0.10	21.47	-0.23	-0.06	-0.29	-0.00
Work engagement	3	487	-.20	-.22	0.26	9.11	-0.89	0.45	-0.71	0.27
Burnout	16	6,177	.33	.37	0.14	11.46	0.29	0.45	0.18	0.56
Job stress	8	2,220	.32	.38	0.12	21.81	0.26	0.49	0.21	0.55
Job insecurity	8	2,441	.39	.45	0.07	36.81	0.37	0.52	0.35	0.55
Work–nonwork conflict	8	2,269	.38	.43	0.22	6.46	0.24	0.62	0.12	0.75

Meta-analysis	*k*	*N*	$\bar{r}$	$\bar{\rho}$	*SD*ρ	%Var	95% CI		80% CrI	
							Lower	Upper	Lower	Upper
Task performance	4	1,150	-.27	-.31	0.13	19.71	-0.54	-0.09	-0.52	-0.11
OCB	4	1,223	-.02	-.02	0.19	9.36	-0.34	0.29	-0.34	0.29
Organizational turnover intention	10	4,526	.25	.27	0.12	13.32	0.18	0.37	0.10	0.44
Professional turnover intention	4	2,832	.24	.25	0.09	15.97	0.10	0.40	0.11	0.39

Note. *k* = number of studies contributing to meta-analysis; *N* = total sample size; $\bar{r}$ = mean sample-size-weighted correlation; $\bar{\rho}$ = mean true-score correlation corrected for unreliability in COVID-19 distress and the correlate; SD_ρ = standard deviation of $\bar{\rho}$; %Var = percentage of variance attributable to artifacts; CI = confidence interval around $\bar{\rho}$; CrI = credibility interval around $\bar{\rho}$. OCB = organizational citizenship behavior.

Table 6

Summary of Takeaways With Corresponding Research Questions and Examples of Future Research Directions

Takeaway	Corresponding research questions	Examples of future research directions
Workers' COVID-19 distress has many meaningful correlates.	Research Question 1	• Investigate age-related advantages and disadvantages that are most relevant to working during pandemics. • Are there gender differences when perceiving pandemics' economic-related vs. health-related threats? • Examine the pandemic-related distress of workers in other interpersonal contexts, such as multigenerational households or shared housing. • Identify the most effective interventions for reducing pandemic-related distress's negative impact on mental health/well-being. • Are there any boundary conditions under which pandemic-related distress is related to tenure, perceived organizational support, work engagement, and organizational citizenship behavior? • Incorporate more sophisticated research methods (e.g., cross-lagged research, diary studies) that will facilitate the modeling of pandemic-related distress simultaneously alongside work-related antecedents, correlates, and outcomes to evaluate the relevance of existing OHP theories to working during pandemics.
COVID-19 distress measure matters.	Research Questions 2	• Continue examining the construct validity of different COVID-19 distress measures incorporated in this meta-analysis. • Investigate the construct validity of additional, emerging pandemic-related distress conceptualizations, such as pandemic fatigue and pandemic apathy.

Takeaway	Corresponding research questions	Examples of future research directions
More evidence of industry's role as a moderator is needed.	Research Question 3	• In primary studies, incorporate measurement equivalence/invariance testing and/or multigroup structural equation modeling to directly assess profession/industry as a moderator. • To better assess the generalizability of COVID-19 distress's impact, revisit, when the literature matures, meta-analytically comparing relationships both within and across industries.
Cultural values and pandemic-related government response are promising moderators.	Research Question 4	• In future primary studies, incorporate multilevel and multigroup designs to account for country-level variables. • When more studies accumulate, revisit present meta-analysis's continuous moderation with machine learning to identify which country-level moderators are the most important when considered simultaneously.
Workers' COVID-19 distress exhibits some incremental validity over and above anxiety and depression.	Research Question 5	• To aid future meta-analytical and theory-building efforts for workers' pandemic-related distress, continue incorporating more well-being and work-related constructs in primary studies on pandemic-related distress. • To aid future meta-analytical and theory-building efforts for workers' pandemic-related distress, conduct more targeted meta-analyses of worker well-being constructs.