

Review

Identifying Psychosocial Risks and Protective Measures for Workers' Mental Wellbeing at the Time of COVID-19: A Narrative Review

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Abstract: The spread of the SARS-CoV-2 virus has caused crucial changes in the workplace. Almost two years after the start of the COVID-19 era, new and old psychosocial risks in the workplace threaten workers' mental wellbeing and represent an occupational health challenge. The aim of this review is to identify the most relevant psychosocial factors, negative or protective, contributing to occupational stress during the current pandemic. A literature search was conducted in PubMed, EMBASE, Cochrane Library, Web of Science, Google Scholar and PsycINFO and a total of 51 articles were deemed suitable for inclusion in the review. Analysis of the retrieved articles revealed five main topics related to psychosocial wellbeing in the workplace: 1. Support from colleagues and organizations; 2. Home-work interface and balance; 3. Changes in workload and work demand; 4. Job competence and appropriate training; 5. Job insecurity and financial stress. All five themes were associated with occupational stress and poor mental outcomes, like anxiety, depression, and burnout symptoms. Peer and organizational support seem to have a major impact on workers' mental wellbeing. Recognizing these factors and projecting interventions that mitigate their effects or boost their efficacy is a fundamental step towards dealing with COVID-19 in the workplace, or any such future emergencies.

Keywords: COVID-19 pandemic; worker's mental health; occupational stress; occupational safety and health; psychosocial risks; social support; work-home balance; training; job insecurity; workload



Citation: Lulli, L.G.; Giorgi, G.; Pandolfi, C.; Foti, G.; Finstad, G.L.; Arcangeli, G.; Mucci, N. Identifying Psychosocial Risks and Protective Measures for Workers' Mental Wellbeing at the Time of COVID-19: A Narrative Review. *Sustainability* **2021**, *13*, 13869. <https://doi.org/10.3390/su132413869>

Academic Editor:
Christian Vandenberghe

Received: 19 November 2021
Accepted: 11 December 2021
Published: 15 December 2021

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1. Introduction

The world of work has been profoundly affected by the global virus pandemic. Workers have been forced to change their habits and lifestyle both at an individual and organizational level. Work arrangements and conditions have changed considerably, raising new challenges for the health and wellbeing of workers, whether in the frontline, in essential services, working from home, or having lost their businesses and jobs. The effects of COVID-19 on the mental health of workers have been widely addressed [1–3], especially for healthcare workers (HCWs). The shortage of personal protective equipment (PPE), and the stigmatization of those working in direct contact with the infected, contributed towards the poor mental outcomes of HCWs involved in the sanitary emergency, particularly at the beginning of the pandemic [4,5]. Anxiety, depression, burnout, post-traumatic syndrome disorder (PTSD) and overall poor mental outcomes have been identified in HCWs dealing with the emergency [1,6,7]. For instance, poor workplace infection control put HCWs, especially those on the frontline, at the risk of being infected and bringing the contagion

home to their family [8,9], causing dramatic psychological distress, especially in the first waves of contagion. In the following phases of the pandemic, the reorganization of the resources and the adjustment of the global market to new medical supply needs, strongly reduced the impact of the PPE impairment on HCWs. Education and awareness within the general public also contributed to a reduction in the aforementioned perception of HCWs. In other economic sectors, the economic crisis and the general uncertainty about the future deeply affected the psychological wellbeing of workers. Those who did not lose their job faced tremendous organizational changes, among which remote working played a big role. After almost two years since the beginning of the COVID-19 era, new and old psychosocial risks in the workplace threaten the mental wellbeing of workers and represent a challenge in Occupational Health. If not appropriately assessed and managed, psychosocial risks may increase stress levels and lead to physical and mental health problems. The ILO defined psychosocial factors in terms of “interactions between and among work environment, job content, organizational conditions and workers’ capacities, needs, culture, personal extra-job considerations that may, through perceptions and experience, influence health, work performance and job satisfaction”. Psychological responses to occupational stress may include low mood, low motivation, exhaustion, anxiety, depression, burnout and suicidal thoughts [10]. At the same time, even the loss of a job or the dramatic reduction in available work represent a major cause of stress among workers [11]: the social and economic impact of the pandemic was evident from the beginning when the global economy collapsed and millions of people lost their jobs [12–14]. The aim of this review is to identify the relevant work-related psychosocial factors, either negative or protective, during the ongoing COVID-19 pandemic which contribute to occupational stress. The National Institute for Occupational Safety and Health (NIOSH) defines work-related stress as a series of ‘harmful physical and emotional reactions that occur when job demands are not commensurate with the worker’s abilities, resources or needs’. Work-related stress is determined by work organization, work design and labor relations and occurs when the demands of the job do not match or exceed the capabilities, resources, or needs of the worker, or when the knowledge or abilities of an individual worker or group needed to cope are not matched with the expectations of the organizational culture of an enterprise. In this review we aim to identify the main aspect of work during the pandemic that causes poor mental outcomes of workers or, alternatively, to identify those aspects that can be protective towards stressful and harming working situations, such as those experienced by HCWs on the frontline. Identifying these aspects has a value not only in this precise historical moment, but also in providing us with a better understanding of the psychosocial processes at work during an emergency, which in turn provides preparedness for the critical situations that companies and governments may face in the future [15].

2. Materials and Methods

2.1. Literature Research, Selection and Data Extraction

A literature search was performed using PubMed, EMBASE, Cochrane Library, Web of Science, Google Scholar and PsycINFO up to April 30th 2021. The search strategy used three main concepts: occupational stress and its several dimensions; “COVID”; and keywords linked to psychological wellbeing and mental health. In particular, the search string for PubMed was the following: (“OCCUPATIONAL STRESS” OR “JOB RELATED STRESS” OR “WORK RELATED STRESS” OR WORKPLACE) AND (COVID) AND (DEPRESSION OR ANXIETY OR “MENTAL HEALTH” OR “PSYCHOLOGICAL HEALTH” OR “PSYCHOLOGICAL WELLBEING” OR PTSD OR “BURNOUT SYNDROME” OR “JOB DEMAND” OR “JOB CONTROL” OR “TECHNOSTRESS” OR “HOME-WORK INTER-FACE” OR “SOCIAL SUPPORT” OR “ECONOMIC STRESS”). The same keywords were used for the literature search in the other databases considered. Additionally, a manual search was performed in the bibliography of the most significant papers. The papers were selected based on the following PICO schemes:

Population: working population;

Intervention: occupational psychosocial stress factors related to COVID crisis/pandemic;
Comparison: not considered;

Outcome: negative psychological outcomes (e.g., depression, anxiety, mental stress).

Two independent reviewers read titles and abstracts of the reports identified by the search strategy and made a first screening; subsequently a further selection was made analyzing the full text of the articles. The judgement about the inclusion of each paper was performed separately by the investigators; disagreements were solved by discussing with a third reviewer. Data were extracted by two reviewers and inserted in a spreadsheet, including country of provenience of the study, type of job considered, scale and tools administered to the sample. Each paper was labelled with one or more main topics related to psychosocial factors at work and the main mental outcomes were identified.

2.2. Inclusion Criteria

We included in this review only articles that provide an insight into specific psychosocial occupational stress issues and described workplace characteristics that may be related to job stress and negative psychological outcomes. Moreover, the articles selected contain psychological negative outcomes such as depression or anxiety symptoms, or work-related stress outcomes such as emotional exhaustion or job satisfaction. We included in the review only original articles while previous relevant review articles are discussed in the Introduction and Discussion paragraph.

2.3. Exclusion Criteria

Reports of less academic significance, editorial articles, letters to the editors, not peer reviewed articles, individual contributions and purely descriptive studies published in scientific conferences, without any quantitative and qualitative inferences were excluded from this review. Moreover, we excluded all the articles describing workers mental issues during the COVID pandemic without any insight into the workplace characteristics and job stress dimension. Finally, we excluded articles referring exclusively to the lack of PPE or impaired safety measures at work as the only workplace dimension analyzed, since the literature has widely proved the negative impact of this dimension on workers mental health.

3. Results

The literature search yielded a total of 3159 results: 392 from Pubmed; 42 from EMBASE; 192 from Web of Science; 11 from Cochrane Library; 82 from PsycINFO; and 2440 from Google Scholar. After a first screening by title and abstract, the subsequent reading of the full texts and the removal of duplicates, a total of 51 papers were deemed suitable for inclusion in the review, according to the inclusion and exclusion criteria. The selection process is described in Figure 1. The selected papers are reported in Appendix A Table A1.

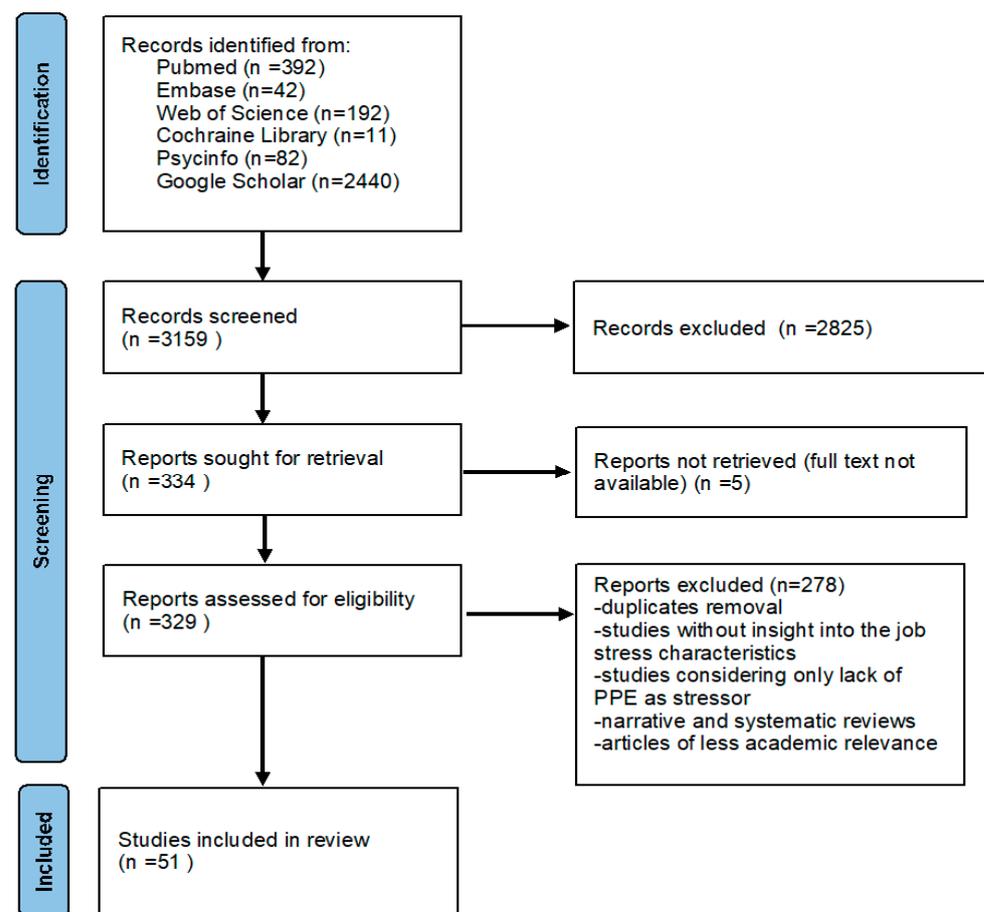


Figure 1. Flow diagram of the literature search and article selection (adapted from PRISMA 2020 guidelines for systematic reviews) [16].

A total of 96% of the papers selected (49/51) were cross sectional studies, and only two studies showed a longitudinal design. Online self-administered surveys were the most frequent tools used to test the sample. Several psychological dimensions were analyzed. Anxiety was mainly tested with the General Anxiety Disorder Scale (GAD-7), depression with the 9-item Patient Health Questionnaire (PHQ-9) or the Goldberg Anxiety and Depression Scale (GADS), post traumatic syndrome symptoms with the 22-item Impact of Event Scale-Revised (IES-R), and burnout with the Maslach Burnout Inventory (MBI) scale. Often ad hoc questionnaires were developed for some studies; For other studies a qualitative approach with interviews and open questions was adopted.

Regarding workplace aspects, ad hoc questionnaires were generally developed and used by the authors. Validated questionnaires used were the Perceived Social Support Questionnaire (PSSQ) and the Perceived Organizational Support (POS) questionnaire, the Effort-Reward Imbalance questionnaire (ERI), the Colquitt Scale for organizational justice, the Utrecht Work Engagement Scale (UWES) for job satisfaction. Six studies adopted a qualitative approach administering free text questionnaires.

Regarding the geographical provenance of the studies included, European countries were the most represented (21/51, 41.6%), followed by North America (9/51, 17.6%) and China (7/51, 13.7%). A total of 38 (74.5%) studies tested healthcare workers of various professions, such as physicians from various specialty backgrounds, nurses, hospital staff, medical assistants, and radiology technicians employed directly or not in the assistance of COVID patients. A further 23 studies (25.5%) explored work-related stress in non-healthcare workers, employed in several sectors, mostly referring to the home-working population.

The analysis of the articles retrieved evidenced five major topics related to psychosocial aspects in the workplace during the COVID-19 pandemic:

1. Support from peers and organizations;
2. Home–work interface and balance;
3. Changes in workload and job demand;
4. Work competence and adequate training;
5. Job insecurity and financial stress.

The results for each topic are reported in the following paragraphs. A summary of the content of each article is included in Table 1 and an overall summary of the findings is presented in Table 1.

Table 1. Summary of main findings and implications.

	Major Findings	Implications
Support from peers and organizations	<ul style="list-style-type: none"> -Most recurrent topic related to workers mental wellbeing in pandemics; -it protects mental health; -it prevents depression, anxiety and burnout among workers; -it has a human and organizational dimension 	<ul style="list-style-type: none"> -Peer support, communication and team building training programs are needed, especially in healthcare settings; -organizational changes can mitigate the impact of the emergency on workers; -clear and effective communication between colleagues and supervisors is a key factor in preventing poor mental outcomes.
Home–work interface and balance	<ul style="list-style-type: none"> -This is affected by long working schedules in HCWs and by the fear of bringing contagion home -It implies difficulty in maintaining work time and home time as separate for remote workers 	<ul style="list-style-type: none"> -Educating employees and supervisors in making clear distinction between free time and work time -Government and organizational measures to support family care can support workers and protect their mental health
Changes in workload	<ul style="list-style-type: none"> -In HCWs, augmented workloads causes anxiety, depression and burnout symptoms; -reduced workloads is associated with loss of economic status and subsequent poor mental outcomes; -for remote workers, it can be configured as technostress and threatens home–work balance. 	<ul style="list-style-type: none"> -Providing adequate resting time is crucial not only for workers' health but also for patients' safety; -balancing job demands and requests with the physical and psychological resources of workers is mandatory in every working environment
Work competence and adequate training	<ul style="list-style-type: none"> -This is a major source of stress for HCWs; -the fear of making mistakes is enhanced by the lack of general protocols to treat COVID; -the feeling of being pushed beyond training contributes to the development of burnout symptoms especially in young HCWs. 	<ul style="list-style-type: none"> -Healthcare organizations must provide adequate training programs, especially when a worker is redeployed from one department to another; -supervisors should understand when workers are pushed beyond training -protocols for the management of COVID patients and scientific data sharing are a relevant resource.

Table 1. Cont.

	Major Findings	Implications
Job insecurity and financial stress	<ul style="list-style-type: none"> -The economic crisis linked to the sanitary emergency meant several categories of workers were uncertain of the future; -the job insecurity and the consequent financial stress causes burnout, anxiety and depression symptoms; -this also involved HCWs with a reduction in patient volume. 	<ul style="list-style-type: none"> -Government measures aimed at sustaining certain working categories can have an important impact on mental status of workers; -when possible, companies should provide job stabilization and economic support to workers

3.1. Support from Peers and Organization

A total of 27 studies (53%) highlighting the importance of support from peers and organizations during the pandemic were included in this review. The selected articles involved different professionals (healthcare workers, employees, security workforce, remote workers, etc.). For most cases, cross-sectional studies were conducted and validated scales, and ad hoc questionnaires and interviews were administered. Depression and anxiety were found to be two psychological dimensions associated with low peer and organizational support [17–23]. An international, cross-sectional study conducted in 41 countries showed that workplace factors, and in particular training for redeployed staff and the provision of wellbeing and mental health support, have a significant negative association with depressive symptoms in workers [17]. Particularly for nurses, low levels of social support and organizational support predicted COVID-19 anxiety [19]. Similarly, reduced social support and difficulties in cooperation between co-workers [20], especially in hospital settings, were associated with high levels of occupational stress [22,24–30]. Moreover, supervisors' support helps employees in dealing with job uncertainties [31] and for essential workers, recognition of the value of their work plays a huge role [32–34]. In several studies, an association between lack of support and burnout syndrome has also been reported [32,35–39]. Perceived organizational support moderated the relationship between the degree of exposure to risk and stress: the relationship appeared weaker when organizational support was perceived as high and the relationship was depicted as stronger when a low level of organizational support was present [38]. Furthermore, organizational and peer support is fundamental in dealing with workplace violence [21]. The support of colleagues helps to control negative emotional reactions in home workers [40]. A supportive environment is protective towards the risk of moral injury for HCWs [41], who are also at risk of post-traumatic syndrome disorder (PTSD). Perceived organizational support, indeed, had a significant indirect effect on PTSD symptoms through the mediation of problem-focused coping strategies and self-efficacy [42].

3.2. Home–Work Interface and Balance

A total of 11 studies (22%) that treat this issue were included in the review. The studies involved healthcare workers and remote workers and explored this dimension through quantitative and qualitative surveys. During the pandemic, home–work interface has become more challenging for workers from different settings, as the effect of the pandemic on job organization threatened to negatively affect the balance between family and work. People working from home during the first lockdown periods experienced less perceived wellbeing than those who remained in their usual workplace [43]. Home workers experienced distractions in the domestic environment [44], however overall working from home had a positive impact on work life [45]. Instead, for HCWs home–work interface was found as a cause of stress and also contributed to the development of burnout symptoms [46,47]. Major concerns included childcare [22,46,48,49], household activities and the relationships with family and friends [50,51]. During this time of emergency HCWs experienced a

significantly lower work-family balance due to long working hours without appropriate rest [52], which was particularly challenging for women as they tended to be more involved in family care [49]. Moreover, the fear of bringing contagion home to family members was a common issue contributing to occupational stress, anxiety and depression symptoms in HCWs [53].

3.3. Changes in Workload and Job Demand

A total of 22 studies (43%) included in the review considered changes in workload and job demand as a risk factor for workers to develop stress, depression, anxiety and burnout symptoms. The papers selected were cross sectional, original research and descriptive studies using validated and not validated questionnaires, with quantitative and qualitative approach. In particular the articles explored this issue mostly in healthcare workers (nurses, surgeons, medical assistants, etc.) but poor mental outcomes were also attested in non-healthcare workers. A change in workload during the COVID-19 outbreak (increased, unchanged, decreased or temporary off) is a recurring theme in the studies. For HCWs this is mostly a heavier workload, while for other professionals the negative mental outcomes are often associated with a decrease in their workload [45]. Anxiety, depression and stress were all psychological dimensions positively related to augmented workload and job demand in terms of longer working hours, intensity and efforts [18,20,25,51,54–59]. Workload increased dramatically for workers who reported, suspected, or confirmed SARS-CoV-2 cases among their colleagues [60,61] and this plays a crucial role in the dimension of work-life balance [53,62]. Workers with too few rest breaks had more anxiety as they were exhausted, had difficulty meeting their basic needs and were constantly exposed to workplace stressors [48,63,64]. Burnout symptoms were also associated with the increase in workload for healthcare and non-healthcare workers [36,39,65]. Also, the perception of workload is connected with the overall work environment and to mental workload [39,52]. For physicians, the change in workload also affected the perception of job role, determining high levels of stress [50]. Another relevant aspect was the sudden and massive adoption of remote work, which contributed to the higher workload experienced by some workers. For remote workers, behavioral stress was positively associated with workload, in terms of heavy remote working and use of technologies [57]. For HCWs, telehealth, tele-conferences and working remotely were mostly positive experiences, however the demarcation line between work and home was often less defined [22]. Conversely, it was found that frontline doctors experienced high levels of work-related stress in managing computer work/electronic medical records [48].

3.4. Work Competence and Adequate Training

A total of 11 studies among the 51 selected (22%) underlined the relevance of the dimensions “adequate training/appropriate work competences” for the occurrence of stress and poor mental health in the workplace during the COVID-19 pandemic. All the articles regarding this theme tested healthcare workers belonging to several professions (nurses, physicians, medical assistants, etc.). The studies selected were cross sectional and used validated and not validated questionnaires or qualitative approaches through interviews to assess the dimensions considered in the sample. Anxiety, depression and stress were all psychological dimensions associated with the feeling of inappropriate work competence and the lack of adequate training [58]. At the same time, work impairment was negatively influenced by anxiety and depression [66]. Factors related to poor training correlated to more frequent depressive and anxiety symptoms, including having been redeployed without training or with unsatisfactory training [17,22,53,55]. Workplace preparation and communication were identified as controllable and modifiable factors in the workplace, which can be related to psychiatric symptoms [55]. Performance at work, fear of making mistakes and uncertainty about how to act properly were factors associated with psychological distress [25,60] as well as disinformation about COVID-19 [48]. Finally,

the feeling of being pushed beyond training was found to be a factor in the development of burnout symptoms [47].

3.5. Job Insecurity and Financial Stress

Six studies (12%) identified job insecurity as well as financial issues as being major stressors during the pandemic for workers. These two dimensions related to the pandemic seem to play a role in the development of stress and can determine poor mental health outcomes. Three studies, two from USA and one from Germany, found this aspect in healthcare workers, nurses and physicians, while three studies, two from Spain and one from Canada, provide insights into the psychological conditions of hotel employees, fashion retailing workers and workers in general, respectively. Two studies about HCWs used a qualitative approach to test their sample. Despite the sanitary emergency requiring extraordinary efforts from healthcare workers, even this category experienced forms of stress related to the uncertainty about the future [65] and concerns about the financial situation related to reduced patient volumes [48,49]. Physicians reported furloughs and pay cuts and expressed frustration at assumptions that physicians would be immune to financial instability, citing both the low salaries for those still in training and extensive student loan debt [49]. Environmental changes, reduced workload, uncertainty, and negative job expectations also constituted predictors for mental workload and the subsequent occurrence of poor mental health outcomes, like burnout, anxiety and depression symptoms, especially for some categories of workers, deeply damaged by the pandemic social and economic crisis [39,67]. Moreover, job insecurity, even at the beginning of the pandemic, was already being associated with higher levels of stress and lower wellbeing [29].

4. Discussion

This review tries to identify job dimensions that played a role in the psychological wellbeing of workers during the outgoing COVID pandemic. Despite the vaccination campaigns, the virus seems to remain endemic and long coexistence with the contagion is expected. Recognizing the main aspects to address in the management of the pandemic in the workplace, especially in this precise historic moment, is fundamental for the planning of interventions at various levels and for preparedness for possible future emergencies. The COVID-19 pandemic has shown us the importance of being deeply prepared for the unexpected events that can lead to change in people's daily life work habits. We identified five major topics in the work environment, which have affected the psychological wellbeing of workers during the pandemic, and which can be a target for specific interventions. First of all, in workplaces the need for support from peers and organizations seems to involve all work categories, from the HCW working in direct contact with the virus to remote workers. Low levels of support from peers and supervisors are associated with poor mental outcomes [68]. A supportive workplace environment, where workers can rely on their colleagues and supervisors is known to be one of the major issues when dealing with difficulties at work [69,70]. Peer support can be defined as "a system of giving and receiving help founded on key principles of respect, shared responsibility, and mutual agreement of what is helpful" [71]. The main support for workers within their organizations often comes from colleagues and managers [72]. Peer support at work strengthens psychological resilience by enhancing coping skills and the development of post-traumatic growth, factors which can protect workers involved in stressful situations [73,74]. In our review peer and organizational support during the COVID-19 pandemic was associated with post-traumatic disorder symptoms, anxiety and depression, occupational stress, job satisfaction, burnout, uncertainty at work, emotional exhaustion, moral injury, and sleep disturbances. We found that during the COVID pandemic, when occupational stress was at very high levels, peer support was a key factor for managing stress at work and it contributed to mitigating the job insecurity faced by several work categories [30,75]. It can be hypothesized that especially in the lockdown phases or in work overload periods, the support of colleagues could partially replace the support of families and friends, thus

explaining the relevance of this issue in preventing and mitigating work stress. In this optic, investing in peer support programs may increase social support and develop resilience, which is a key factor in managing significant sources for stress or trauma [76]. Communication and team building training programs could help boost social support, especially in healthcare settings. Organizational support is another aspect linked to the maintenance of workers' mental wellbeing: the perception of organizational support refers to employees' global beliefs regarding the extent to which the organization values their contributions and cares about their wellbeing [77]. This organizational support not only motivates employees to work harder and fosters a bond to the company, but also protects workers from poor mental outcomes during this emergency phase [78]. Organizational changes can mitigate the impact of the emergency on workers, and clear and effective communication between colleagues and supervisors is a key factor that is needed to prevent poor mental outcomes. Organizational support can also be related to the provision of adequate training for workers. Training is defined as the process by which employees are provided with the knowledge and skills needed to function in their work environment [79]. Several studies highlighted the strain experienced by HCWs in their job as they did not feel prepared and did not have protocols to follow in order to treat COVID patients. Throughout our research, a lack of adequate training is associated to depression, anxiety, PTSD and burnout symptoms, as well as to general psychological distress, work-related stress and the loss of motivation. During the most acute phases of the pandemic in particular, HCWs have been deployed from one department to another, without receiving suitable training. These findings suggest the need for regular training programs, not only regarding professional topics, but also on emotional regulations and team-work training with a view to making employees feel supported and to decrease their feelings of perceived occupational stress and workload [80,81]. Healthcare organizations should provide adequate training programs; shared protocols and guidelines on managing the COVID-19 emergency are crucial to guiding HCWs in their job. Another occupational issue to have emerged during the pandemic is the change in workload. Workload is a traditional job demand item characterized by the need to work faster, to offer quicker responses, to reach several objectives at the same time and perform multiple tasks. According to the job-demand resource model [82], the work environment possesses job demands (e.g., workload, physical working conditions and physical demands) that exhaust employees' cognitive and physical resources, which result in health problems and a loss of energy. Occupational strain, which was even a worldwide problem among health professionals before the COVID-19 pandemic, became a major topic and an actual risk for healthcare personnel and we found that it was associated with emotional exhaustion, anxiety, depression, PTSD and burnout symptoms. This aspect is particularly relevant as it affects not only the single worker, but is known to have an impact on patients' safety, in particular in terms of medical errors reported [83]. Thus, it is essential that healthcare organizations provide enough time to recover from fatigue as rest is a priority for the wellbeing of both workers and patients. In this sense, the organization of work shifts can be a crucial factor for management to consider. Strictly connected to the increasing workload, we found that home-work imbalance was another relevant issue associated with mental health impairment during the pandemic. Work-life balance can be described as the balance that individuals need between the time allocated for work and other aspects of life, including family, social and leisure pursuits, and other domains of health and well-being [84]. The imbalance between home life and work life is associated in our review to perceived job productivity and satisfaction, occupational stress, and burnout symptoms. The connections between work and home life are crucial, especially in a society where double-paying couples are common. Even before the COVID-19 pandemic, doctors experienced the stress derived from a poor balance between life at work and at home, often causing emotional exhaustion [85,86]. Childcare was one of the major concerns, for training doctors for example, as they were exposed to higher levels of workload. This specific psychosocial factor may affect female workers more than their male counterparts, configuring the need for an appropriate gender specific approach to

the issue [87]. In this scenario, practical organizational support measures, such as flexible schedules, are relevant interventions that can address workers' issues and boost their mental wellbeing. Government and organizational measures in order to support family care can also support workers and protect their mental health. On the other hand, remote workers experienced a different kind of imbalance between work and home. If there was an overall appreciation of the possibility of working from home, remote working, which was widely adopted by companies since the very beginning of the pandemic, can often blur the line between work and free time, not allowing employees to take a substantial break from work [88]. Remote workers may experience the constant willingness to be connected to their work using information and communication technologies (ICT) and may tend to work longer than usual as ICTs create expectations for a faster response. In this sense, work-related technostress can emerge as a relevant risk factor. Technostress is "an IT user's experience of stress when using technologies" [89]. In workplaces, the ICT demands were associated with increased strain, stress, and burnout [90]: the massive adoption of remote working, which is probably set to last after the pandemic, needs further research involving the issue of technostress. Educating employees and supervisors to make a clear distinction between free time and work time can be a suitable intervention in mitigating the uneasiness derived from this issue. In our review we also found that the reduction in workload may cause poor mental outcomes, mainly linked to insecurity about the future and the loss of economic status. The mental outcomes associated with this dimension are anxiety, depression, PTSD and burnout symptoms, as well as work-related stress. Even the perception of job insecurity, which characterizes the job market during COVID-19, may have an impact on employees' financial anxiety. The job insecurity related to COVID was found to be associated with psychological wellbeing through financial stress [91] and is also linked to lower vitality. Interestingly, job insecurity also involved healthcare professionals, who found themselves in a sort of paradox, caught between high workload and financial instability. Government measures aimed at sustaining certain working categories can have an important impact on the mental status of workers and when possible, companies should provide job stabilization and economic support to workers.

A summary of main findings of the review and other implications are reported in Table 1.

Strengths and Limitations

This review has some strengths that need to be highlighted. First, it searched the literature after 18 months of COVID-19 pandemic, thus giving an updated overview of the mental outcomes in the workplace in the era of COVID-19. Moreover, the selection of articles focused on papers that gave insights into the working conditions during the pandemic and made some associations between mental outcomes and specific psychosocial factors in the workplace. Some specific interventional possibilities have been recognized that could protect and boost workers' mental health. Although this review adopted a qualitative approach, this is compliant with the PRISMA statement, which gives more strength to the evidence retrieved. Finally, unlike previous research, this review also focused on non HCWs workers, recognizing characteristics of work which had an impact on mental health during the pandemic and during emergencies in general. Nevertheless, some limitations should be addressed. Most of the studies selected have a cross-sectional design, thus limiting the strength of the conclusions and the possibility of making causal inferences. Moreover, data have been collected in different stages of the pandemic and in different countries, which may have affected the results, especially considering the heterogeneity in the management of pandemic in workplaces in the world. Another concern is related to the scales and tools used to test the participant and to adequacy in the selection of samples.

5. Conclusions

Support from peers and organization, home–work balance, changes in workload, training and job insecurity are relevant topics for the mental wellbeing of workers during the pandemic. Recognizing these factors and projecting interventions in order to mitigate their effects, or to boost their efficacy, is a fundamental step in dealing with COVID-19 in the workplace and with future emergencies. The five dimensions retrieved play a fundamental role in the wellbeing of workers, HCWs and non HCWs, during the pandemic: they are associated to anxiety; depression; burnout; PTSD symptoms; and work-related stress. Intervening in these psychosocial risks, with specific programs from companies and policy makers, can prevent poor mental outcomes in workers during the ongoing COVID-19 pandemic.

Author Contributions: Conceptualization, L.G.L., G.G. and N.M.; methodology, L.G.L., G.G. and N.M.; software, L.G.L. and C.P.; validation, L.G.L., G.F. and G.L.F.; formal analysis, G.G., G.A. and N.M.; investigation, L.G.L., C.P. and G.F.; resources, L.G.L. and G.L.F.; data curation, G.G., N.M. and G.A.; writing—original draft preparation, L.G.L. and G.L.F.; writing—review and editing, G.G. and N.M.; visualization, L.G.L., G.G. and N.M.; supervision, G.A.; project administration, G.A.; funding acquisition, G.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Summary of the articles included in the review.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Aguiar-Quintana et al. [67]	353/Spain/Cross-sectional study	Hotel employees	Ad hoc questionnaires	Job insecurity and financial stress	Anxiety and depression	Job insecurity of employees did not significantly influence Task Performance but was positively and significantly associated with Anxiety and Depression
Zhou et al. [42]	107/China/Short-term longitudinal study	Frontline HCW	The Chinese version of Impact Event Scale-Revised (CIES-R), A perceived organizational support scale was developed, ad hoc questionnaires for coping strategies.	Support from peers and organization	PTSD	Perceived organizational support had a significant indirect effect on PTSD symptoms. Problem-focused coping strategies and self-efficacy mediate this effect.
Zhang J. et al., [54]	4850/China/Cross-sectional study	Frontline HCW	ERI questionnaire, the 9-item Patient Health Questionnaire (PHQ-9), 7-item General Anxiety Disorder Scale (GAD-7).	Changes in workload and job demand	work stress, depression, anxiety	Effort and over-commitment were positively associated with depression and anxiety, and negatively associated with reward, through development and job acceptance.
Khajuria A. et al. [17]	2527/Multiple countries (China, UK, USA)/Cross-sectional study	HCWs	Patient Health Questionnaire-2 (PHQ-2); questionnaires ad hoc for workplace factors	Work competence and adequate training/Support from peers and organizations	Depressive symptoms	Poor training and poor support in the workplace, including being redeployed without adequate training, were all highly significant correlated to more depressive symptoms.,

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Gilleen J. et al. [55]	2773/UK/Cross-sectional study	HCW	Patient Health Questionnaire (PHQ-9), General Anxiety Disorder-7 (GAD-7), 22-item Impact of Event Scale-Revised (IES-R)1; ad hoc questionnaires on work conditions and possible factors of anxiety and depression	Support from peers and organization/Changes in workload and job demand	Anxiety and depression symptoms	Insufficient personal protective equipment availability, workplace preparation, training and communication, and higher workload were associated with anxiety and depression symptoms. Sharing stress, resilience and ethical support were associated with better psychological outcomes.
Escudero-Castillo I. et al. [43]	1050/Spain/Cross-sectional study	Workers not further specified	Ad hoc questionnaires	Home-work interface and balance	Personal wellbeing	The lockdown exerted a greater negative effect on the self-perceived wellbeing of unemployed and furloughed persons than on those in employment. Teleworkers experienced a lesser degree of self-perceived wellbeing post lockdown as compared to those people remaining in the same work location.
Babore A. et al. [30]	595/Italy/Cross-sectional study	HCWs	Perceived Stress Scale (PSS-10); The COPE-New Italian Version (COPE-NVI-25)	Support from peers and organization	Occupational stress	Lower positive attitude, higher social support, working with COVID-19 patients and higher avoidance strategies predicted higher levels of distress. The higher the positive attitude, the lower distress, while social support and avoidance constituted risk factors for work-related stress.
Bulinska-Stangrecka H. et al. [24]	220/Poland/Cross-sectional study	IT employees	Ad hoc questionnaires	Support from peers and organization	Job satisfaction	Employee relations including interpersonal trust support, help building job satisfaction, even in a virtual space and remotely.
Afulani P.A. et al. [35]	414/Ghana/Cross-sectional	HCW	10-item Cohen perceived stress scale. Burnout was assessed using the 14-item Shirom-Melamed Burnout measure (SMBM), ad hoc questionnaires	Support from peers and organization	Job stress, burnout	Healthcare workers who felt somewhat prepared and appreciated/experienced support from management and support by family had lower stress and burnout scores than those who did not feel prepared. Fear of infection was associated with higher stress and burnout.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Charoensuk-mongkol P. et al. [31]	300/Thailand/ cross-sectional	University employees	Adapted scale for Uncertainty at work, supervisor support was measured using the scale of Cole et al. (2006); Emotional Exhaustion was measured using the scale of Maslach and Jackson; Organizational Intransigence was measured using the scale of Patterson et al. (2005).	Support from peers and organization	Uncertainty at work, emotional exhaustion	Perceived uncertainties were associated with emotional exhaustion. Supervisor support has a negative effect on the perceived uncertainties of employees, however this support can be suppressed by organizational intransigence.
Cipolotti L. et al. [25]	158/UK/cross sectional	Hospital employees (HCW and non HCW)	Ad hoc questionnaire assessing psychological impact of COVID	Changes in workload and job demand/Work competence and adequate training	Psychological distress	Work challenges (performance at work/making mistakes, changes to role/hours worked/shift patterns, discussions with dying patients families, dealing with families), and social change (distancing from family, not doing regular activities) predicted psychological distress
Elbay R.Y. et al. [18]	442/Turkey/cross sectional	HCW on frontline and not	DAS-21; specific questionnaires on working conditions	Support from peers and organization/Changes in workload and job demand/Work competence and adequate training	Depression and anxiety symptoms	Increased weekly working hours, increased number of COVID-19 patients cared for, lower level of support from peers and supervisors, lower logistic support and lower feelings of competence during COVID-19 related tasks were associated with higher DAS-21 total scores.
Gómez-Galán J. Et al. [32]	2182/Spain/cross-sectional	Security workforce	Maslach Burnout Inventory (MBI) scale; ad hoc questionnaire for subjective perceptions about their working conditions and the need for psychological and psychiatric treatment; the Death Anxiety Scale.	Support from peers and organization	Burnout	Stress and anxiety levels increased in work as a result of not having the basic supplies for their personal protection. Most workers reported that they have not felt recognized in their professional activity by their institution.
Hines S.E. et al. [41]	96/USA/ longitudinal study	HCW	Impact of Events Scale-Revised (IES-R) Moral Injury Events Scale (MIES); specific questionnaires on occupational factors	Support from peers and organization	Moral injury	A supportive workplace environment was related to lower moral injury, whereas a stressful, less supportive environment was associated with increased moral injury.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Kannampalli T. et al. [46]	393/USA/cross-sectional	Physician trainees	DASS-21; Stanford Professional Fulfillment Index (PFI). Specific questionnaires on work–family balance and perceived life stressors	Home–work interface and balance	Burnout, stress	The group exposed to COVID-19 patients experienced moderate to extremely high perceived stress regarding childcare and considerably lower work–family balance. Their job duties interfered with their family life, and they experienced more difficulty in taking time off for attending to personal or family matters.
Labrague L. et al. [19]	325/Philippines/cross-sectional	Nurses	COVID-19 Anxiety Scale, the Brief Resilient Coping Scale (BRCS), the Perceived Social Support Questionnaire (PSSQ) and the Perceived Organizational Support (POS) questionnaire	Support from peers and organization	Anxiety symptoms	Social support, personal resilience and organizational support predicted COVID-19 anxiety. Increased scores in the social support, organizational support and personal resilience measures were associated with lower COVID-19 related anxiety.
Magnavita N. et al. [64]	155/Italy/cross-sectional	Anesthetists	Specific questionnaires on changes in occupation and lifestyles; Effort-Reward Imbalance questionnaire, Colquitt Scale (organizational justice), Goldberg Anxiety and Depression Scale (GADS).	Changes in workload and job demand/Work competence and adequate training	Occupational stress, anxiety symptoms	A significant increase in workload was associated with work-related stress and low perceived levels of organizational justice. Workers experienced little ability to influence and change the outcome of procedures. Levels of anxiety and depression were significantly correlated with work effort.
Manzano-Garcia G. et al. [36].	771/Spain/cross-sectional	Nurses	Questionnaire on socio-demographic data; Spanish Burnout Inventory (CESQT) for burnout, the UNIPSICO Battery for the evaluation of certain psychosocial factors of demand and resources in the context of work; ad hoc scale for perceived threat of COVID-19	Changes in workload and job demand/Support from peers and organization	Burnout	Work overload, material and human resources and social support at work were significant in explaining burnout. The perceived threat of COVID-19 moderated the relationship between social support at work and burnout.
Marco C.A. et al. [48]	1300/USA/cross-sectional	Emergency Physicians	Life Events Checklist for DSM-5, the PTSD Checklist for DSM-5	Changes in workload and job demand/Work competence and adequate training/Job insecurity and financial stress	PTSD/work related stress	The major sources of stress identified by participants included disinformation about COVID-19, computer work/electronic medical record, PPE concerns, and workload. Financial stress related to reduced patient volume and concerns about work–home imbalance were present, especially in those caring for homeschooling children. This played a role in the stress perceived.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Mattila E. et al. [20]	1079/Finland/ cross-sectional	Hospital staff	Generalized Anxiety Disorder 7-item scale (GAD-7), specific questionnaires on demographic data, changes in work, interaction between co-workers, psychological distress linked to work, fear of contagion.	Support from peers and organization/Changes in workload and job demand	Anxiety symptoms	Anxiety symptoms were associated with: young age, working in a university hospital, problems in cooperation between co-workers, difficulty concentrating at work, a health-threatening physical and psychological workload, and a fear of being infected at work.
Moretti A. et al. [44]	51/Italy/cross-sectional	Home working population (put in remote worker since the beginning of pandemic)	Utrecht Work Engagement Scale (UWES) for job satisfaction, Brief Pain Inventory (BPI) and Fear Avoidance Beliefs Questionnaire (FABQ) for MSK issues; ad hoc questionnaire for structural aspects of the workplace at home	Home-work interface and balance	Perceived job productivity and satisfaction, work-related stress, and musculoskeletal (MSK) issues.	Thirty-nine percent of the subjects working from home self-perceived to be less productive but less stressed, while 51% were equally satisfied. Among mobile working advantages, the most appreciated was saved travel time and the least appreciated was greater autonomy. Impaired interaction with colleagues and distractions in the domestic environment were the worst disadvantages
Morgantini L.A. et al. [47]	2707/Various countries (USA, Italy, Brazil, Sweden, others)/cross sectional	Healthcare workers	Ad hoc questionnaire containing questions covering three major domains of HCPs experience (exposure, perception, and workload)	Home-work interface and balance/Work competence and adequate training	Burnout	Burnout was associated with work impacting household activities, feeling pushed beyond training, exposure to COVID-19 patients and making life prioritizing decisions. Burnout was higher in high-income countries compared to low- and middle-income countries.
Portoghese I. et al. [50]	521/Italy/cross-sectional	Physicians	Ad hoc questionnaire on organizational preparedness, personal preparedness concerns about catching COVID-19; perceived impact on personal job (role and demand) and on personal life, perceived job stress, rumination about the pandemic, crying at work.	Changes in workload and job demand/Home-work interface and balance	Job stress	The risk factors for perceived job stress were concerns about catching COVID-19, perceived impact on job demands, perceived impact on job role and non-working concerns (fear of infecting relatives and friends).

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Soto-Rubio A. et al. [37]	125/Spain/cross-sectional	Nurses	Trait Meta-Mood Scale (TMMS-24) for emotional intelligence, UNIPSCO Battery for psychosocial risks, Interpersonal conflicts scale, Lack of organizational justice scale, Role conflict scale, Workload scale Social support scale, Job satisfaction scale, Frankfurt Emotional Work Scale (FEWS), Questionnaire for the Assessment of Workplace Burnout Syndrome (CESQT)	Support from peers and organization	Job stress, burnout	The emotional intelligence of nurses can influence interpersonal conflicts or lack of organizational justice at work. Emotional repair component can be a factor that when enhanced can prevent the possible adverse effects related to burnout and job satisfaction.
Tušl M. et al. [45]	2118/Switzerland, Germany/cross-sectional	Employees	Warwick–Edinburgh Mental Well-Being Scale (WEMWBS), ad hoc questionnaires for impact of COVID in life and change in work	Home–work interface and balance/Changes in workload and job demand	Mental wellbeing and self-reported health	Mandatory short-time work was strongly associated with perceived negative impact on work life, while work from home, particularly if experienced for the first time, was strongly associated with a perceived positive impact on work life. Perceived negative impact of the crisis on work and private life and mandatory short-time work were associated with lower mental wellbeing and self-reported health.
Yang Y. et al. [21]	2878/China/cross-sectional	HCWs	Chinese version of the Workplace Violence Scale, 9-item Patient Health Questionnaire (PHQ-9). The 7-item General Anxiety Disorder Questionnaire (GAD),The 26-itemWorld Health Organization Quality of Life Questionnaire (WHOQOL-BREF)	Support from peers and organization	Depression, anxiety	Frontline clinicians' experience of workplace violence directly affected quality of life and emotional disturbances partly mediated the association between workplace violence and the quality of life
Zandi G. [38]	129/Pakistan/cross-sectional	Physicians	Perceived stress scale for job stress, scale for extent of exposure to COVID, scale adapted from Survey of Perceived Organizational Support (SPOS) for organizational support	Support from peers and organization	Job stress	Perceived organizational support moderated the relationship between the extent of exposure and stress. The relationship appeared weaker when organizational support was perceived high; the relationship was stronger with a low level of perceived organizational support.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Zerbini G. et al. [65]	110/Germany/ cross sectional	Nurses and physicians	Patient Health Questionnaire(PHQ) the Maslach Burnout INventory (MBI), specific scale for fear of COVID infection and stress at work, open questions.	Changes in workload and job demand/Job insecurity and financial stress	Depression symptoms, burnout	The most common causes for burden were job strain and uncertainty about the future. Psychosocial support as well as leisure time were listed important resources, and a better infrastructure adjustment to COVID-19 at the hospital (e.g., sufficient staff, keeping teams and working schedules stable)as suggestion for improvement.
Zhang X. et al. [54]	524/China/ cross sectional	Medical Staff	Generalized Anxiety Disorder Scale, the Patient Health Questionnaire, the Insomnia Severity Index, the Occupational stress Questionnaire.	Changes in workload and job demand	anxiety and depression symptoms, job stress	Working intensity, working time, working difficulty and working risk were correlated positively with mental health symptoms. A significant association was found between occupational stress and mental health symptoms in both frontline and non-frontline medical staff during COVID-19 outbreak.
Lee H. et al. [40]	131/Singapore/ cross sectional	Remote workers	Open ended questions for qualitative analysis	Support from peers and organization	Mental status related to emotions perception	The employees' emotional reactions were elicited from the perceived organizational support, in how the organization cares for their wellbeing and work contributions and, in turn, influence the psychological safety. Anxiety, stress, unfairness, inferiority and vulnerability are triggered by perceived
Al-Ghunaim T. et al. [53]	141/UK/ qualitative analysis	Surgeons	Qualitative analysis through two open-ended questions	Changes in workload and job demand/Work competence and adequate training	Stress and burnout; fear anxiety, loss of motivation, low mood.	Surgeons' mental health during COVID-19 pandemic was affected by substantial emotional and psychological effects particularly in relation to fear and anxiety, loss of motivation, low mood, stress and burnout, highlighting the urgent need for workplace support and mental health interventions.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Al-Mansour, K. et al. [26]	1378/Saudi Arabia/cross sectional	Physicians, nurses, other health pro- fessionals and other workers who worked in the primary healthcare centers.	-Perceived Stress Scale (PSS) Rosenberg Self-Esteem Scale (RSES); Multidimensional Scale of Perceived Social Support (MSPSS);-scale for ambiguity at work.	Support from peers and organization	Stress	During the COVID-19 pandemic, higher levels of stress and role conflict and ambiguity were found among HCWs in fever clinics than among HCWs in regular primary healthcare centers in Saudi Arabia. Role conflict and ambiguity, social support and self-esteem were found to be major determinants of stress among HCWs during the pandemics.
Digby, R.et al. [22]	321/Australia/ qualitative analysis	Medical, nursing, allied health and non- clinical staff	Qualitative: Free-text questions	Work competence and adequate training/Support from peers and organization	Anxiety, stress	Healthcare staff need both practical and psychological support and regular clear communication to minimize anxiety, promote well-being, foster resilience, and ensure that they are in a strong position to deal with the health crisis
Dreher, A.et al. [60]	2150/Germany/ cross sectional	Medical assistants (MA)	Patient Health Questionnaire (PHQ-2); Generalized Anxiety Disorder questionnaire (GAD-2); questions on socio-demographic data, own contraction of SARS-CoV-2, contraction of SARS-CoV-2 among family, friends, and colleagues, and questions on attitudes, stressors, and work-related outcomes during SARS-CoV-2 pandemic.	Support from peers and organi- zation/Work competence and adequate training	Anxiety, depression	A low level of preparedness and high levels of uncertainty affected MAs in Germany regarding the SARS-CoV-2 pandemic. Major stressors were uncertainty about the temporal scope of the pandemic, uncertainty about how to act correctly, a feeling of not being allowed to let patients down and uncertainty about one's financial situation.
Elshami, W. et al. [59]	385/Middle East, North Africa and India/cross sectional	RWF working at hospitals during the pandemic, such as ra- diologists, radiogra- phers, advanced practition- ers and radiology nurses	The survey consisted of four sections: demographic characteristics, radiology professional practice survey, the Coronavirus Anxiety Scale (CAS), and the Fear of COVID-19 Scale(FCe19S).	Job insecurity and financial stress/Changes in workload and job demand/Work competence and adequate training	Stress, anxiety, fear	Fear was associated with workers younger than 30 years of age and also with temporary staff. Nevertheless, anxiety occurred completely independently of gender, age, experience, country, working environment and work status. Professional support is needed to reduce or prevent fear, stress, and anxiety among HCPs.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Yang, Y. et al. [51]	1208/China, USA/cross sectional	664 doctors, 246 nurses	DASS (Depression, Anxiety, and Stress Scale); PSS (Perceived Social Support Scale)	Changes in workload and job demand	Anxiety, depression, stress	Stress, anxiety, and depression were positively related to lower levels of social support, longer working hours, discrimination experience and workplace violence. Stress, anxiety, and depression were positively related to lower levels of social support, longer working hours, discrimination experience and workplace violence.
Feeley, T. et al. [52]	408/Ireland/cross sectional qualitative design	Intensive care unit (ICU) staff	Open questions	Changes in workload and job demand/Job insecurity and financial stress/Home- work interface and balance	Occupational stress	The home, work and social environments, the home-work interface and uncertainty about the future were the major themes retrieved. The work environment-team structure, senior staff guidance, social communication, colleague support, altered role, high workload-dictated the emotional and psychological responses of healthcare staff.
Gul, S. et al. [63]	192/Turkey/cross sectional	Operating rooms nurses	Beck Anxiety inventory (BAI)	Support from peers and organi- zation/Changes in workload and job demand	Anxiety	Nurses experienced moderate levels of anxiety as they are inexperienced and must work with patients who pose a serious level of risk; they should be trained in critical patient care in order to reduce their anxiety levels.
Havaei, F. et al. [33]	3676/Canada/cross sectional	Nurses	Post-traumatic Stress Symptoms-14 (PTSS-14); Generalized Anxiety Disorder-7 (GAD-7); Patient Health Questionnaire-9 (PHQ-9); EE subscale of the Maslach Burnout Inventory; Human Services Survey (MBI-HSS)	Support from peers and organization	Anxiety, PTSD, depression, burnout	Negative ratings of workplace relations, organizational support, organizational preparedness, workplace safety, and access to supplies and resources were associated with higher scores on all of the adverse mental health outcomes. Better workplace policies and practices are urgently required to prevent and mitigate nurses' suboptimal work conditions.

Table A1. Cont.

Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Halley, M.C. et al. [49]	1806/USA/ qualitative analysis	Physician mothers	Qualitative approach	Support from peers and organization/Home- work interface and balance/Job insecurity and financial stress	Stress	Leaders within healthcare organizations and the government need a deep understanding of the physician mothers' challenges in order to ensure robust public health policies, adequate equipment for personal safety and optimal patient care, and support to meet basic personal financial and family needs.
Hu, J. et al. [34]	1:163/2:282/3:210/ China/USA/cross sectional	1: employees of an infor- mation technology company 2: Amazon's Mechanical Turk 3: Amazon's Mechanical Turk	Ad hoc questionnaires	Support from peers and organization	Anxiety symptoms	COVID-19-triggered mortality salience increases state anxiety. Mortality salience not only triggers anxiety about own deaths but also generates tremendous overall anxiety. Servant leaders who keep employees' well-being paramount and model compassion can help anxious employees stay engaged at work and help the broader community.
Ingusci, E. et al. [57].	530/Italy/ cross sectional	Remote workers	Validated scales for workload, job crafting and behavioral stress	Changes in workload and job demand/Work competence and adequate training	Occupational Stress	The direct effect between work overload and behavioral stress was positive; the indirect, negative effect through the mediation of job crafting was also significant. Job crafting can play a crucial role as a protective factor supporting the activation and adjustment of suitable resources; these resources can be useful to deal with the negative effects of work overload, particularly under the condition of heavy remote working and use of technologies.
Mekonen, E. et al. [58]	302/Ethiopia/cross sectional	Nurses	DASS-21	Changes in workload and job demand/Work competence and adequate training	Anxiety, depression, and stress	Workload, taking training, having a guideline, adequate protective equipment, having children, fear of infecting family members, feedback from families and friends are significantly associated with anxiety, depression and stress.

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Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Al-Jumaili, A.A. et al. [27]	430/Iraq/cross sectional	Healthcare providers (HCPs)	Adopted items of surveys used in previous studies of Severe Acute Respiratory Syndrome (SARS) and Avian Influenza Outbreak	Support from peers and organization	Stress	Working during COVID-19 pandemic has several negative impacts on HCPs including mental and physical health and an overwhelming work environment. Thus, social and emotional support is needed to help HCPs to cope with such stressful conditions
Mo, Y., et al. [23]	200/China/cross sectional	Nurses	Self-rating Anxiety Scale (SAS); Stress Overload Scale (SOS); General Self-efficacy Scale (GSES)	Support from peers and organization	Anxiety, stress, self-efficacy	Nurses' mental health were affected by, sleep status, stress and self-efficacy. Work stress and self-efficacy were closely correlated with anxiety. Social support plays an important role in alleviating mental stress. Self-efficacy is negatively correlated with anxiety.
Nguyen, P. et al. [62]	761/Vietnam/cross sectional	Healthcare workers	Impact of Event Scale-Revised (IES-R)	Changes in workload and job demand	Stress	It was found that there was a higher risk of having stress among HCWs who were at the frontline, since they perceived their health status as worse as compared with that before the pandemic. Most HCWs were worried about being a potential source of infection to their families.
Norful, A. [28]	55/USA/qualitative analysis	Healthcare workers	Qualitative interviews	Support from peers and organization	Burnout, anxiety, sleep disturbance, stress	Uncertainty of COVID-19 practice guidelines, lack of resources, and risk of transmission to loved ones at home were the primary drivers behind stress. Further, anxiety, physical exhaustion, and sleep disturbances were the predominant manifestations of stress experienced by participants. Psychosocial support and increased teamwork across disciplines emerged as a significant mitigator of stress, yielding less perceived burnout and improved clinician wellbeing.

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Authors	Sample/ Country/ Study Design	Working Population	Scale Used	Intervention/ Psychosocial Risks Identified	Mental Outcomes	Main Results
Rodriguez-Lopez, A.M. [39]	360/Spain/cross sectional	Fashion Retailing Workers	CarMen-Q Mental workload questionnaire (Cognitive Demands, Temporal Demands, Emotional Demands, Performance Demands); MBI Burnout Syndrome Inventory (Emotional Exhaustion, Depersonalization, Personal Accomplishment); Perception of COVID-19	Changes in workload and job demand/Job insecurity and financial stress	Burnout	Participants exhibited deep concern about the COVID-19 pandemic and its influence in the workplace. Environmental changes, work overload, somatic symptoms, insomnia, negative job expectations, and uncertainty constituted significant mental workload predictors. Insomnia, somatic symptoms, and negative job expectations constituted significant predictors for burnout.
Tokac, U. et al. [66]	83/USA/cross sectional	Nurses	Patient Health Questionnaire (PHQ-9); Generalized Anxiety Disorder (GAD-7) Scale; Insomnia Severity Index (ISI); Impact of Event Scale-Revised (IES-R); Compassion Fatigue and Satisfaction Self-Test (CFS); Work Productivity and Activity Impairment Questionnaire (WPAI:GH)	Work competence and adequate training	Anxiety, depression, burnout, avoidance level	Nurses' work impairment decreased with greater years of nursing experience and increased with higher anxiety, depression, burnout and avoidance levels.
Coulombe, S. et al. [29]	1122/Canada/cross sectional	Workers not further specified	Perceived Stress Scale (PSS) Patient Crisis; Disaster Preparedness Scale; Depression and Anxiety (PHQ-4); ad hoc questionnaires	Job insecurity and financial stress/Support from peers and organization	Distress and stress	COVID-19 crisis encompasses several stressors related to the virus as well as to its impact on one's social, occupational, and financial situation, putting workers at risk of lower wellbeing.
Moreno-Jiménez, J. et al. [61]	221/Spain/cross sectional	Health professionals	Nursing Burnout Scale (NBS), Occupational Hardiness Questionnaire, Short Burnout Questionnaire, Secondary Traumatic Stress Scale, ad hoc questionnaires	Changes in workload and job demand	Emotional exhaustion and secondary traumatic stress	The lack of human resources predicted emotional exhaustion through the workload and secondary traumatic stress through fear of contagion, contact with death/suffering, and workload.

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