

## Post-traumatic stress disorder in nurses during COVID-19: a narrative review

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### SUMMARY

#### Background

Since December 2019, the new coronavirus disease (COVID-19) or severe acute respiratory syndrome SARS-CoV-2 has spread rapidly around the world and has reached pandemic proportions that have affected all continents.

#### Methods

Thanks to the PICO research strategy (population, intervention, comparison, results), a specific search string was used. To include relevant literature on the topic, several search terms belonging to each PICO section were combined. 339 studies published in English in the last 3 years (2020-2022) were identified, available on: EMBASE and MEDLINE.

#### Results

The studies included in this narrative review included 14 observational studies. Summarize the article's main findings.

#### Conclusions

Cultural, social and economic differences significantly influenced the mental health condition of all healthcare workers involved.

**Key words:** COVID-19, nurse, post traumatic stress disorder

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### Introduction

Since December 2019, the new coronavirus disease (COVID-19) or severe acute respiratory syndrome (SARS) CoV-2 has spread rapidly around the world and has reached pandemic proportions that have affected all continents<sup>1-4</sup>. The World Health Organization (WHO) declared the outbreak as an international public health emergency, in fact, from 11<sup>th</sup> March 2020 it was declared as a global pandemic<sup>5</sup>. Until April 8, 2022, around 494 million COVID-19 confirmed cases and over 6 million deaths have been globally reported (WHO Coronavirus - COVID-19). Previous respiratory infections from this century, such as SARS (Middle East Respiratory Syndrome, MERS), and Ebola infectious diseases have been shown to cause psychological damages to nurses, affecting their coping skills and, in some cases, their long lasting effects manifesting themselves, such as: stress, anxiety, depression and post-traumatic stress disorder (PTSD)<sup>6-8</sup>. According to the Diagnostic and Statistical Manual<sup>9</sup>, Post Traumatic Stress Disorder (PTSD) is a psychiatric illness caused by traumatic incidents outside the context of common human encounters, such as physical assault, violence, illness, disaster natural and healing from some diseases. People

with PTSD experience disturbing thoughts or emotions related to a traumatic accident long after the event has occurred. A traumatic accident can be personally encountered or observed, or it can also result from knowledge of a traumatic event suffered by a close individual. PTSD is diagnosed after a person has experienced symptoms for at least 1 month after a traumatic accident. Symptoms most commonly appear within 3 months of the event, but they can take years to develop. A wide range of signs is associated with PTSD, such as reliving painful memories, recurring memories, flashbacks, nightmares, mental numbness and avoiding trauma-related individuals, environments and accidents, as well as heightened arousal such as difficulty sleeping and processing, becoming nervous and feeling anxious and annoyed. The severity of this disease lies in the fact that these symptoms can occur at any age and that if not treated promptly can lead to symptoms up to 10 years after the traumatic event<sup>10,11</sup>, causing high turnover of nurses, endanger patient safety and affect the quality of life of affected nurses<sup>11</sup>. A recent American study<sup>12</sup> has addressed the financial issue of PTSD costs, calculating that the major studies have been done for the military, it has been determined that the overall expenditure is very onerous; it was estimated at \$ 232.2 billion for 2018 (\$ 19,630 per individual with PTSD). Total excess costs were \$ 189.5 billion (81.6%) in the civilian population and \$ 42.7 billion (18.4%) in the military population, corresponding to \$ 18,640 and \$ 25,684 per individual with PTSD in the civilian and military populations, respectively. In the civilian population, the excess burden was from direct health care (\$ 66.0 billion) and the costs of unemployment (\$ 42.7 billion). In the military population, the burden was from disability (\$ 17.8 billion) and the direct costs of health care (\$ 10.1 billion). The COVID-19 pandemic also impacted the psychological health in nurses<sup>13-17</sup> and healthcare professionals<sup>18,19</sup>, as evidenced by several studies conducted in different parts of the world. It also appeared that all healthcare professionals experienced psychological distress but, it has been recognized, that nurses reported higher risks of burnout and PTSD<sup>20</sup>. Although a recent systematic review summarized the evidence regarding mental health outcomes in healthcare workers during the COVID-19 pandemic, highlighting increased levels in burnout (ranging from 3.1 to 43.0%) and PTSD (ranging from 7.4 to 37.4%)<sup>21</sup>. Few studies evaluated PTSD occurring as a secondary outcome of stress<sup>17,22-24</sup>. The specificity in the literature on mental health in nurses was still poorly summarized. It could contribute to limit the updated understanding estimates regarding burnout and PTSD levels among nurses<sup>25</sup>. Considering that nurses represent more than half of all healthcare

professionals globally<sup>26</sup>, a review of the literature concerning to their burnout and PTSD levels will help frame an updated assessment of the current global scenario. This assessment could be useful in informing decision makers about planning supportive and preventative strategies to support mental health in nurses in a medium- and long-term perspective.

**Objective**

This review aimed to systematically synthesize evidence related to PTSD among nurses working in the front lines of COVID-19 patients.

**Materials and methods**

Thanks to the PICO research strategy (population, intervention, comparison, results), a specific search string was used<sup>27</sup> (Tab. I).

To include relevant literature on the topic, several search terms belonging to each PICO section were combined (Tab. II). Articles written in English were only considered. The search strategy envisaged the use of the following terms indicated in the Table II, both for free search and using the MeSH database, individually and in combination with the Boolean operators AND and OR. The same terms were used for the search on the Embase and Medline databases (Tab. II).

339 studies published in English in the last 3 years (2020-2022) were identified, available on: EMBASE (148) and MEDLINE (191)<sup>28</sup> (Fig. 1).

Through an initial bibliographic search on electronic databases, all the articles deemed relevant for the purposes of this review were identified.

Repeated articles were removed several times in the databases consulted and those suitable for review were identified. Subsequently, two authors evaluated potentially relevant studies with respect to the initial research objective and the possibility of access to full-text (Fig. 1)<sup>28</sup>.

All studies that met the following criteria were included in the review:

- studies that aimed to investigate, as a primary objective, the impact of the COVID-19 pandemic on the nurses suffering from PTSD;

**TABLE I.** *The PICO instrument to literature review conduction.*

|                                |  |
|--------------------------------|--|
| <b>P = patients/population</b> | Studies on nurses during the covid pandemic              |
| <b>I = Interventions</b>       | Onset of mental disorders post traumatic stress disorder |
| <b>O =Outcome</b>              | Incidence of new cases                                   |

**TABLE II.** Search queries.

| No. | Query   | Results | Date           |
|-----|---|---------|----------------|
| #4  | ((('wuhan coronavirus':ti,ab,kw OR 'wuhan seafood market pneumonia virus':ti,ab,kw OR 'covid19*':ti,ab,kw OR 'covid-19*':ti,ab,kw OR 'covid-2019*':ti,ab,kw OR 'sars-cov-2':ti,ab,kw OR sars2:ti,ab,kw OR '2019-ncov':ti,ab,kw OR '2019 novel coronavirus':ti,ab,kw OR 'severe acute respiratory syndrome coronavirus 2':ti,ab,kw OR '2019 novel coronavirus infection':ti,ab,kw OR 'coronavirus disease 2019':ti,ab,kw OR 'coronavirus disease-19':ti,ab,kw OR 'novel coronavirus':ti,ab,kw OR coronavirus:ti,ab,kw OR 'sars-cov-2019' OR 'sars-cov-19':ti,ab,kw OR 'sars-cov-2019' OR 'sars-cov-19':ti,ab,kw OR 'sars-cov-2019':ti,ab,kw) AND (('nurse'/mj OR 'anaesthetist nurse assistant':ti OR 'anesthetist nurse assistant':ti OR 'community health nurse':ti OR 'community health nurses':ti OR 'nurse':ti OR 'nurse, community health':ti OR 'nurses':ti OR 'nurses, community health':ti OR 'nurses, public health':ti OR 'nursing assistance':ti OR 'public health nurse':ti OR 'public health nurses':ti OR 'staff nurse'/mj OR 'staff nurse':ti OR 'psychiatric nursing'/mj OR 'mental health nursing':ti OR 'psychiatric nursing':ti OR 'nurse attitude'/mj OR 'nurse attitude':ti,ab,kw OR 'nurse's attitude':ti,ab,kw OR 'nurse's role':ti,ab,kw OR 'nurses attitude':ti,ab,kw OR 'nurses role':ti,ab,kw) AND ('depression'/mj OR 'central depression':ti OR 'clinical depression':ti OR 'depression':ti OR 'depressive disease':ti OR 'depressive disorder':ti OR 'depressive episode':ti OR 'depressive illness':ti OR 'depressive personality disorder':ti OR 'depressive state':ti OR 'depressive symptom':ti OR 'depressive syndrome':ti OR 'mental depression':ti OR 'parental depression':ti OR 'anxiety'/mj OR 'anxiety':ti OR 'mood disorder'/mj OR 'affective disorder':ti OR 'affective disorders':ti OR 'affective disturbance':ti OR 'affective illness':ti OR 'mood disorder':ti OR 'mood disorders':ti OR 'mood disturbance':ti OR 'mood disturbances':ti OR 'mental health'/mj OR 'condition, mental':ti OR 'health, mental':ti OR 'mental care':ti OR 'mental condition':ti OR 'mental factor':ti OR 'mental health':ti OR 'mental help':ti OR 'mental service':ti OR 'mental state':ti OR 'mental status':ti OR 'mental status schedule':ti OR 'psychic health':ti OR 'physiological stress'/mj OR 'physiologic stress':ti OR 'physiological stress':ti OR 'physiological stresses':ti OR 'stress':ti OR 'stress capacity':ti OR 'stress reaction':ti OR 'stress resistance':ti OR 'stress response':ti OR 'stress situation':ti OR 'stress tolerance':ti OR 'stress, physiological':ti OR 'alarm reaction':ti OR 'acute stress disorder'/mj OR 'acute stress disorder':ti OR 'acute traumatic stress disorders':ti OR 'stress disorder, acute':ti OR 'stress disorders, traumatic, acute':ti OR 'mental stress'/mj OR 'mental stress':ti OR 'mental stresses':ti OR 'mental tension':ti OR 'nervous stress':ti OR 'psychic stress':ti OR 'psychic tension':ti OR 'psycho-social stress':ti OR 'psycho-social stresses':ti OR 'psychologic stress':ti OR 'psychological stress':ti OR 'psychosocial stress':ti OR 'psychosocial stresses':ti OR 'stress, mental':ti OR 'stress, psychological':ti OR 'stress, psychological':ti OR 'tension, mental':ti OR 'tension, psychic':ti OR 'distress syndrome'/mj OR 'distress':ti OR 'distress syndrome':ti OR 'dystress syndrome':ti OR 'psychological distress':ti OR 'professional burnout'/mj OR 'burnout, professional':ti OR 'career burn-out':ti OR 'career burnout':ti OR 'occupational burn-out':ti OR 'occupational burnout':ti OR 'professional burn-out':ti OR 'professional burnout':ti))) AND (2020:py OR 2021:py OR 2022:py) | 339     | March 31, 2022 |

- research articles, such as observational, interventional studies;
- full text available in English.

Studies were excluded:

- editorials, literature review;
- studies which explored other mental health disorders, such as: anxiety, depression or insomnia;
- studies dealt with other healthcare professionals, without including nurses.

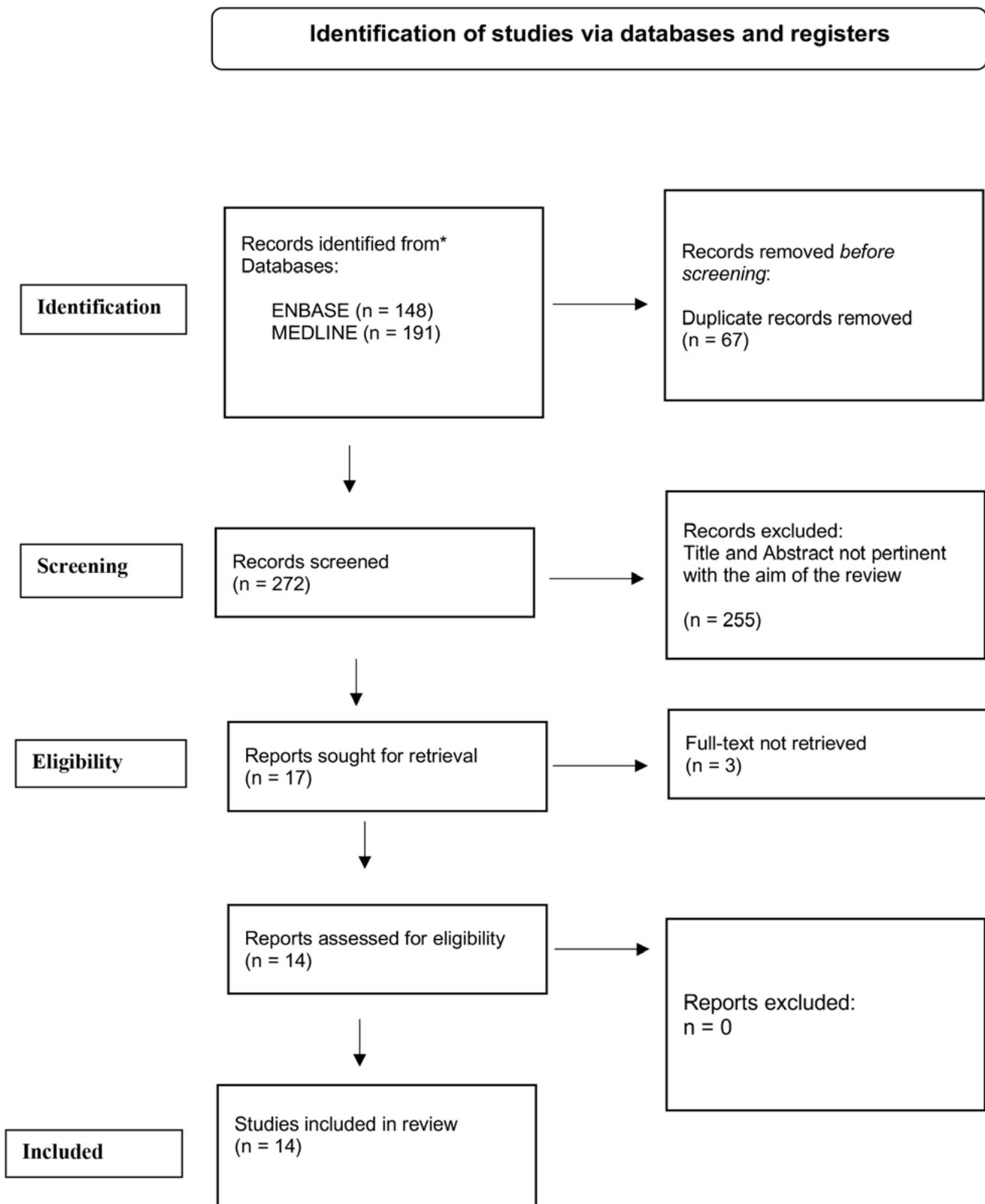
## Results

The studies included in this narrative review included 14 observational studies of which (Tab. III):

- 13 cross-sectional studies<sup>17,29-40</sup>;
- 1 study performed through a qualitative analysis<sup>41</sup>.

The selected studies were performed heterogeneously in all parts of the world:

- 3 in the USA<sup>32,40,41</sup>;
- 1 in Italy<sup>36</sup>;



**FIGURE 1.** PRISMA 2020 flow diagram for “Post-Traumatic Stress Disorder in Nurses during the covid-19 pandemic”.

**TABLE III.** *Studies included.*

| Author(s)<br>Publication year<br>Country                 | Objective   | Sampling   | Study design<br>PTSD tool assessment                                  | Results   |
|--|---|--|---|---|
| Zeihner W. et al.,<br>2022 <sup>40</sup><br>USA          | To explore any associations between:<br>NPE<br>PTSD<br>the intention to leave   | 56 nurses  | Cross-sectional study PES-NWI, PCL-S, TIS                             | PTSD scores were higher in nurses with an unfavorable environment than (M [SD], 27.91 [7.01]) than nurses who lived a favorable practice environment  |
| King M. et al.,<br>2022 <sup>34</sup><br>Ireland         | To evaluate psychological effects in mental health nurses   | 161 nurses   | Cross-sectional study IES-R, SAS                                      | PTSD diagnosis was experienced in nurses during the COVID-19 pandemic   |
| Levi P. et al.,<br>2022 <sup>41</sup><br>USA             | To investigate the lived experiences in ICU nurses during the COVID-19 pandemic which impacted their mental health and attitudes towards their careers                  | 10 nurses  | Qualitative study<br>Semi-structured interviews<br>PTSD checklist job | 7 out of 10 nurses met the diagnostic criteria for PTSD. 5 out of 10 nurses considered to leave their professions   |
| Bani Issa et al.,<br>2021 <sup>30</sup><br>Emirati Arabi | To assess the extent of PTSD development among frontline nurses, exploring motivational factors for continuation of work and investigating factors associated with PTSD | 370 nurses   | Transversal Study<br>PDS  | 36.2% of participants had a probable diagnosis of PTSD (PDS score $\geq$ 28). Nurses reported from moderate to severe PTSD, with avoidance and hyperarousal as the most frequent reported symptoms                                  |
| Engelbrecht et al.,<br>2021 <sup>31</sup><br>Sud Africa  | To investigate PTSD and coping strategies in nurses during the second wave of the COVID-19 pandemic   | 286 nurses   | Cross-sectional study IES-R, COPE, PPE                                | Nurses had an M score of 31.5 (SD 20,586) on IES-R. One more look careful revealed that 44.4% of nurses scored above 32 on the IES-R, which is indicative of higher levels of PTSD, with 38.8% of nurses suffering from severe PTSD |
| Hill R., 2021 <sup>32</sup><br>USA                       | To explore the impact of COVID-19 and the prevalence of PTSD among careers in COVID-19 patients   | 31 nurses<br>18 (58.0%)<br>with high exposure<br>7 (22.6%)<br>with low exposure<br>6 (19.4%)<br>with no exposure |   | 18 high exposure participants experienced symptoms of PTSD  |
| Kabungu A. et al.,<br>2021 <sup>33</sup><br>Africa       | To analyze PTSD and associated predictors during the second wave of COVID-19.   | 601 nurses   | cross-sectional descriptive study<br>PDS-5<br>PCL-C                   | 61.7% of nurses reported PTSD. Healthcare professionals working in COVID-19 environment were nearly 3 times more likely to report symptoms of PTSD versus those not exposed   |

- 2 in Africa (South Africa, Uganda) <sup>31,33</sup>;
- 2 in China <sup>17,35</sup>;
- 1 in the United Arab Emirates <sup>30</sup>;
- 1 Korea <sup>37</sup>;
- 1 Jordan <sup>39</sup>;
- 1 in Poland <sup>38</sup>.

In particular, Table III showed a summary of the main characteristics and results of the included studies. Among the selected studies, PTSD was assessed by using different tools. Although, the most assessment tools adopted were: the 7 PCLs (1 PCL-S, 3 PCL-C, 3 PCL-5), 5 used IES-R, for a total of 2967 nurses.

## Discussion

The current review suggests that healthcare professionals have reported a substantial degree of PTSD incidence during the COVID-19 pandemic.

The studies included in the review covered a total of 2947 nurses worldwide employed in the USA, Italy, Africa, China, Korea, United Arab Emirates, Jordan and Poland <sup>17,29-41</sup>. Different PTSD measurement tools were adopted, such as: PCL and IES-R. A significant incidence of PTSD in nurses was highlighted, showing prevalence differences related to different variants, including geographic location, gender, the marital status and the Department of belonging.

In particular, the highest incidence of PTSD was found in female nurses, in the wards at the front line of the COVID-19 emergency, including Emergency Department, Intensive Care and Infectious Diseases. Data were in agreement to previous literature <sup>37,38</sup>. In this regard, Marcomini et al. <sup>36</sup> found that nurses who experienced themselves in the front lines of COVID-19 patients care registered higher levels of PTSD, presumably linked to lack of experience before the pandemic in infectious disease. Just literature showed that age and work experience did not appear as predictive factors in infectious disease management <sup>41-43</sup>. A greater incidence was found among married nurses and nurses with children, although <sup>44</sup> positively highlighted the existence in family and social support as a protection strategy. Compared to the different parts of the world, there was a substantial increase in PTSD in the Eastern Mediterranean regions, the Western Pacific and South-East Asia compared to Europe.

These geographical discrepancies might be, presumably, attributable to the degree of responsibility and seniority in their workplaces and in their families, their social support networks <sup>45,46</sup>. Greater importance, in the PTSD developing risk, was given to factors, such as: isolated working environmental and lack working conditions and the forced usage of the personal protective equipment (PPE) <sup>35</sup>, the lack of rest and protracted shifts <sup>47</sup> and the discomfort in carrying out the work shift wearing all the required PPE <sup>32</sup>.

The association between the onset of the PTSD and the personal predisposition referable to the perception of one's health emerged, since an incorrect lifestyle and / or the presence of pre-existing diseases could lead to greater psychological fragility <sup>48,49</sup>.

From the work carried out it emerged that all the studies examined reported, a significant lowering of the sense of personal and work safety and a growing desire to abandon the nursing profession, a worrying fact already found in scientific reading, with exception of 2 studies which concluded by stating that the health crisis experienced during the pandemic peaks have strengthened the ability of nurses to respond and successfully adapted care practices.

To better understand the experiential experience that professionals are facing, it is important to mention some statements made by them during the data collection of the Hill study <sup>32</sup>, which are emblematic of the situation that workers faced and face:

- “a patient death is difficult as it is. But some days we just had to switch from one code to another. And a few moments before all this, these patients had to say goodbye to the family who cannot even cry at their bedside”;
- “people [were] dying without seeing their families or without being kept alive with machines with a very poor prognosis”;
- “we have run repeated codes on patients who medically and ethically should be DNR”;
- “with this virus, patients deteriorate rapidly. You can do anything that comes to your mind and the patient continues to deteriorate. It's hard to be a caregiver and not be able to help your patient no matter how hard you try”;
- “[I have] feelings of inadequacy and failure due to our COVID [patients] not receiving the care they deserve (mainly due to the need to pool care). Even feeling like we are doing things to them rather than to them because we don't really know how to cure this disease”.

In our systematic review we have identified both strengths as:

- the included studies photographed the problem of PTSD on nurses in different parts of the world, increasing the overall view of the problem;
- the data and the eligibility of the studies was performed by two independent researchers, increasing the solidity of the results;
- the general vision of the PTSD problem only two years after the pandemic gives a general picture of the problem and the programmatic direction that one wants to take;
- the psychological status of nurses in the included studies was not assessed prior to the pandemic.

This has limited our ability to explore the additional psychological burden on the nurse due to the COVID-19 pandemic as we have no data on their psychological state prior to it;

- failure to find 3 items;
- due to the worldwide blocking policy, most of the included studies were web-based cross-sectional surveys, so that there could be the possibility of sampling errors;
- substantial heterogeneity between studies was identified, which could be increased due to the difference in rating scales (variation in cut-off scores) used in the studies to explore outcomes;
- furthermore, the estimates of the aggregate analyses were based on cross-sectional data, undermining the possibility of describing the trajectory of PTSD over time (before COVID-during).

Only research papers published in English were included, contributing to the lack of some studies.

## Conclusions

The COVID-19 pandemic was a traumatic event of unprecedented magnitude that pushed normal beyond normal and human and professional endurance threshold of nurses, causing serious mental health disorders. The current narrative revision aimed to give an update regarding the mental health status, in particular on PTSD among nurses who were at the front line during the COVID-19 pandemic. From the selected literature, it could state that cultural, social and economic differences significantly influenced the mental health condition of all healthcare workers involved. Consequently, health care organizations should be more sensitized to the needs of nurses by providing various arrangements, such as: short service hours and adequate rest hours,

sufficient protective supplies, support services. National disaster preparedness plans should also have included a plan to safeguard mental health in nurses and health workers in general. For example: regular screening for mental health disorders, physical symptoms, promoting coping and resilience strategies, targeted interventions to prevent PTSD, turnover, providing more flexible working hours and encouraging nurses to use psychological support services. Furthermore, greater investment in addressing the global shortage of nurses should take priority in national health policies, especially in low- and middle-income countries, where rates of PTSD have been shown to be higher. These actions will be helpful to prevent the PTSD effects, such as: personal distress, also in the own workplaces, with the risk of reducing professional skills, the empathic involvement level, the relational skills in individual operators and then, in the whole teams, respectively.

It will be also desirable to implement all existing services to support mental health in nurses, in prevention, treatment and rehabilitation areas.

## Conflict of interest statement

The Authors declare no conflict of interest.

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## Author contributions

The Authors equally contributed.

## Ethical consideration

Not applicable.

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