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Suicidal ideation and suicide commitment in Health Care Workers during COVID-19 pandemic: a review of the literature

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ABSTRACT

Introduction: Suicide represents an important public health concern since it leads to more annual deaths globally than violence, war and natural disasters combined. During this pandemic year, the phenomenon acquires even greater importance especially in the categories at risk, such as health care workers (HCWs). This review aims to analyze literature evidence regarding health care providers' suicidal ideation (SI) and suicide commitment during the first year of the COVID-19 pandemic.

Methods: International databases and digital worldwide media reports were screened between March 2020 to March 2021. The authors conducted a systematic review and described evidence using a narrative approach with some focus points based on the PICO framework. Inclusion or exclusion of literature is done according to Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) recommendations.

Results: The review showed range of SI varied from 4% to 8% and the main risk factors seemed to be loneliness, not having children and personal history of mental disorders.

Conclusion: SI, and in worst cases suicide commitment, seem mental health outcomes not to be underestimated, especially in an emergency that is protracting. They require monitoring by health surveillance systems with a goal of prevention and support.

Key words: Covid-19, Health Care Workers (HCWs), Mental Health, SARS-COV-2, Suicide commitment, Suicidal Ideation (SI).

INTRODUCTION

The first year of the coronavirus disease 2019 (COVID-19) pandemic resulted in more than 255 million confirmed cases and over five million deaths cumulatively by November 19, 2021.[1] The outbreak caused a serious slowdown of the global economy, modified and invalidated social activities and compromised people's mental health. The uncertainty, severity, and persistence of the pandemic continue to result in significant challenges on global medical systems. Health care staff remain one of the most vulnerable categories for psychological sequelae.[2,3] Literature from all over the world has already ascertained that health care workers have significant levels of self-reported anxiety, depression, insomnia and even symptoms of post-traumatic stress disorder.[4-15] Nevertheless, the potential for even more serious mental health sequelae has not received enough attention.[16]

A recent meta-analysis published by Duarte et al., on Jama Psychiatry evidenced how suicide, even before

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the pandemic, represented an important public health issue since it leads to more annual deaths globally than violence, war and natural disasters combined. The main risk factors are male gender, younger age, unmarried status, fewer years of formal education, mental disorders and occupational hazards.[17-19] Health care workers (HCWs) are at increased risk for suicide compared to other occupational groups, including the military and the general public.[20] Despite a considerably higher risk of suicides in men than women in the general population, female doctors have higher suicide rates than men putatively because of their social family role or because of poor status integration within the profession. The suicide rate among male doctors seems to be 40% higher than that among men in general, whereas the rate among female doctors seems 130% higher than that among women in general.[19,20] Some specialties have been suggested to be particularly at risk of suicides with occupational factors individualized in different medical or surgical specialties: heavy workload and working hours involved in the job such as long shifts and unpredictable hours with the sleep deprivation associated and the stress coming from emergencies and easy access to drugs can increase the risk of committing suicide.[17-20] Psychiatry, anesthesiology, general practitioners and general surgeons were the specialties at greater risk and the most common disorders were depression and/or substance abuse.[17-19] A 2019 meta-analysis evidenced that the prevalence of physicians having suicide attempts was statistically significant.[20]

Several factors contribute to the higher rates of suicide seen among physicians. Physicians have a broad knowledge of pharmacology including the lethal doses of medications which makes suicides by overdose more commonly fatal than in the general population. Physicians also have increased access to potentially lethal medications within the hospital and clinic settings. Physicians tend to use suicide methods of higher mortality including hanging and firearms. This increased knowledge and use of highly lethal means equate to a higher percentage of suicide attempts by physicians being lethal. In this context, there is a double peak with the highest incidence occurring in late-middle age and another peak during the training years of residency and fellowship. The peak during training is often due to the extreme and stressful time of training with working long hours, risk of professional mistakes, and balancing work and family duties. The higher peak later in life has been due to physicians' loss of identity either by retirement or decline of their own physical health.[21,22]

Despite the increasing interest that has been recently devoted to HCW's mental health due to the pandemic, relatively few studies have reported suicide in this category of subjects.

Consistently, the rationale of the present manuscript is to analyze literature evidence regarding health care providers' suicidal ideation (SI) and suicide commitment, during the first year of the COVID-19 pandemic, to highlight the importance of this issue in the context of occupational surveillance.

METHODS

Medline/PubMed, Psychinfo, Cochrane library, and Embase databases were accessed to search and collect papers published between March 2020 (being the month during which the WHO declared COVID-19 a public health emergency of international concern) and March 2021. Our digital search strategy involved the following keywords "Suicide", "COVID-19", "Health Care Workers/staff/providers" and their derived words.

Reference sections of the identified papers were eventually checked for additional studies. Digital worldwide media reports were also screened for additional, no representative, case reports.

Each study was screened for eligibility by the authors after reading the title and abstract. Authors selected those studies with titles referring to mental issues regarding HCWs while for the abstracts only those that referred to suicidality. Any uncertainties concerning eligibility were discussed and resolved among all authors. We included studies published in English in indexed journals and when the full manuscript was available. Media reports referring to cases of suicidality among HCWs were also added and discussed.

The authors conducted a systematic review and described evidence using a narrative approach with some focus points based on the PICO framework. Population: country, gender, age, working role/position; Intervention: the tool used to assess SI; Outcomes: Percentages of SI and vulnerability factors.

The decisions for inclusion or exclusion are summarized in a flow chart according to Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) recommendations. Details are reported in Figure 1.

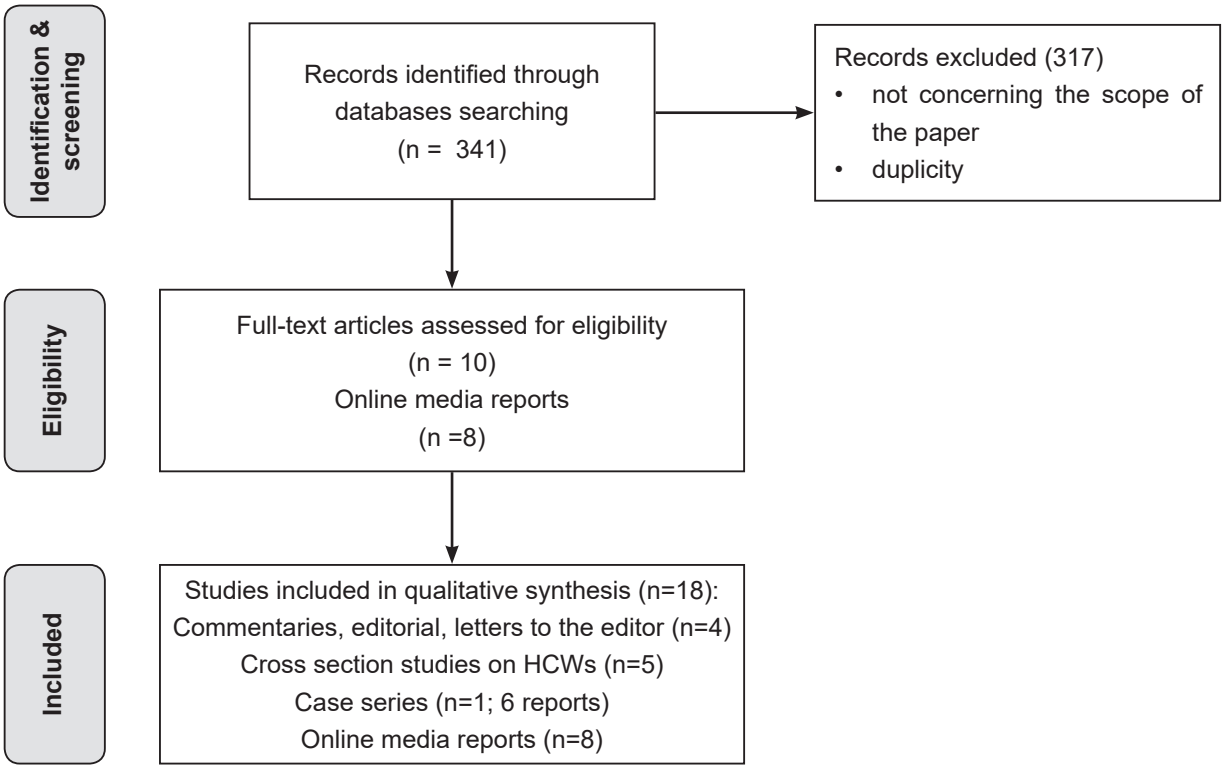

Figure 1: PRISMA Flow-chart of study selection process

RESULTS

The digital search retrieved 327 results. The authors then excluded duplications and titles whose subject matter was not relevant to the scope of this paper. After the screening of both titles and abstracts,10 studies were selected as potentially relevant and 14 other cases were selected from media reports. Four papers were commentaries or letters to the editor, five papers were cross-sectional, observational studies based on clinical interviews with the use of SI tools. Among these, one study was from India, one was from Bangladesh, one was from China, one was from Belgium and one was from Spain. Then one paper reported some worldwide case report series and another paper reported a single case report from Italy. Finally, the media reports reported three cases from India, one case from Canada, one from the United States, one from France and another one from Italy. (Table 1)

The pandemic has exposed health care workers to significant pain, death and even physical isolation to reduce risks for their families. In this regard, a leading theory for suicide states that individuals who felt isolated and view themselves as a burden to others are more likely to experience SI. Further, exposure to extreme experiences also increases the risk for suicide by normalizing pain and decreasing fear of death.[23]

Another noteworthy consideration is that health care workers may have less time and maybe less comfortable seeking care than the general population and this can bring to a worsening of a mental disorder.[2,3,23] This culture of stigma leads many physicians to attempt to treat their mental health issues with prescription medications or self-help style therapies.[25,26]

Literature evidence also showed relationship between SI and sleep difficulties which were common problems of HCWs, especially during the actual pandemic.[4-7,27] Several potential neurobiological elements may partly explain the relationship. Sleep problems may be linked to a series of metabolic and neuroendocrine dysregulation, including decreased serotonergic function, reduced orexin levels, increased activity of the hypothalamic-pituitary-adrenal axis, and elevations in inflammatory markers which are involved in the increased vulnerability to suicide.[28]

Five studies reported SI rates during the actual pandemic. Two studies were among European populations, in particular, Belgium and Spain, and three studies were among eastern populations, in particular

China, Bangladesh, and India. The five studies opted for different tools to investigate SI. Two studies used a modified version of the Columbia Suicide Severity Rating Scale (C-SSRS)[29], one study opted for a single item of the Patient Health Questionnaire-9 (PHQ-9)[30] which is a nine-item scale to assess the severity of depression symptoms, and two studies used a single screening question. In particular, the criterion to explore SI in the Chinese study was the answer to the ninth item of PHQ-9: "Have you ever thought that you would be better off dead or of hurting yourself in some way." Not at all" meant no SI, while other answers, such as "several days", "more than half the days", or "nearly every day" meant SI. The criterion to explore SI in the Belgian study was the use of a modified version of the C-SSRS: "In the past 30 days, have you wished that you were dead or that you would go to sleep and never wake up?" was the question to investigate passive thoughts of suicide, "In the past 30 days, did you have thoughts of killing yourself?", was the question to investigate active thoughts of suicide, "In the past 30 days, did you think about how you might kill yourself [e.g., taking pills, shooting yourself] or work out a plan of how to kill yourself?" was the question to explore suicide plans and finally, "In the past 30 days, did you make a suicide attempt [i.e., purposefully hurt yourself with at least some intent to die]?" was the question to investigate suicide attempts. The Spanish study used the same items of the C-SSRS. The criterion for SI in the Bangladesh study was the single answer (i.e., Yes/No response) to the single question: "do you think about committing suicide, are these thoughts persistent due to COVID-19 related issues, and have you moved forward to plan and attempt?". Similarly, the criterion for SI in the Indian study was the answer about suicidal thoughts and attempts after the onset of the pandemic using a single screening question of a completely new survey instrument developed by the authors for the pandemic.

Among the 11507 participants of the Chinese study, 6.47% of the hospital staff reported SI. The SI prevalence in doctors, nurses, technicians, and administrators were 6.26%, 6.68%, 6.37%, and 5.56%, respectively. No statistical differences emerged between genders or between the working role. On the contrary, results from a regression analysis showed that higher stress perceived, being single, higher probability of infection or having a relative infected as well as having previous mental disorders resulted in positive association with increased SI. Regarding the Bangladesh study that was among 3388 participants, 6.1% of the total respondents reported SI. Results from a regression analysis showed that being female, not having children and being single were risk factors for SI. Regarding the Belgian study, 3.6% was the prevalence rate of passive SI, 1.5% was of active SI, 1.0% was of suicide plan and 0.0% reported suicide attempt. Being infected and hospitalized because of COVID-19 were the most strongly associated factors with SI. Other factors correlated with SSI were having a lifetime or current mental disorder. This last consideration was the only one that emerged also from the Indian study, a general screening on 3083 HCWs (4.2% presented SI) which was just partially focused on suicidality. In the Spanish study, the prevalence of SI among the 5169 participants was 8.4%. Of those, 4.9% reported passive SI. The other percentages were 3.5% for active SI (0.8% without plan/attempt and the 2.7% with plan/attempt). Further, this study emerged that SI was more elevated among those with a higher perceived level of stress, preexisting mood and anxiety disorders as well as with hospitalization for COVID-19 and also among those that changed to specific COVID-19 related work locations. Female gender and being married resulted as protective to any suicide plan or attempt (Table 1).

A total of 14 case reports were reported from worldwide media reports. Eight cases involved nurses and six cases involved doctors. Four cases occurred in India, three cases occurred in Italy, two in the United States, one in England, one in Mexico, two in Canada and one in France. Most of the cases of suicide were among women (with nine cases) and the total mean age of the whole sample was 36.1±13.4 years. Two doctors had a leadership position in the fight against COVID-19, one was the Director of the Emergency Room at New York-Presbyterian hospital, and the other was the Director of the Environmental Prevention and Protection Department of the Hospital of Cosenza who coordinated the Covid-19 vaccination program for the hospitals of Cosenza and Rogliano in Italy. Among the whole sample, five tested positives for SARS-COV-2 and seven worked in a COVID-19 unit or an emergency scenario. Only one person seemed to have concomitant use of drugs. No one had an official history of mental disorders (Table 2).

Table 1: Characteristics of included studies

Authors	Journal	Participants	SI %	Factors associated with higher SI
Zu et al., 2020	Psychiatry research	11507	6.8	-Marital status:single -Perceived stress -Inadequate support -The current need for psychological intervention -Family members or relatives infected/high risk for infection -Previous/current mental disorder
Mamun et al., 2020	Heliyon	3388	6.1	-Gender:Female -No children -Marital status:single/divorced
Bruffaerts et al., 2021	Journal of Affective Disorders	8758		-Previous/current mental disorder -Infection and hospitalization for covid-19
Parthasarathy et al., 2021	Asian Journal of Psychiatry	3083	4.2	Previous mental disorder
Mortier et al., 2020	Depression and anxiety	5169	8.4	Marital status:single -Perceived stress -Inadequate support -No children -Previous/current mental disorder

Table 2: Suicide cases of HCWs during the COVID-19 pandemic

Nationality	years	gender	Work role	Sars-cov-2	Working position
USA	32	male	nurse	-	COVID-19 unit of the JFK Hospital, Atlantis (Florida)
USA	49	female	doctor	positive	Director of the Emergency Department of New York Presbyterian hospital, New York
Canadian	35	female	doctor	-	Emergency Department of Granby hospital, Quebec
Canadian	25	female	nurse	-	Occupational health Department, Humber River Hospital. Toronto
Italian	49	female	nurse	positive	COVID-19 ward at Jesolo Hospital, Venice.
Italian	34	female	nurse	positive	Intensive Care Unit in San Gerardo Hospital, Monza
Italian	56	male	doctor	-	Director of the Environmental Prevention and Protection Department of the Hospital of Cosenza, Cosenza
France	61	male	doctor	positive	The Reims club's doctor
England	±20	female	nurse	-	Intensive Care Unit of King's College. London
Mexico	-	female	nurse	positive	Raymundo Abarca Alarcon General Hospital Chilpancingo,
India	22	female	nurse	positive	Medanta Hospital Gurugram, New Delhi,
India	28	female	nurse	-	Ahmedabad's Civil Hospital
India	35	male	doctor	-	Covid-19 ward, Max hospital's Saket branch, Delhi
India	24	male	doctor	-	Department of orthopedics, Government Stanley Medical College and Hospital, Chennai

DISCUSSION

The present review has tried to summarize the most recent evidence concerning the trend of suicidality in HCWs during the current pandemic. The aim was to highlight the extent of the problem and the possible etiological causes.

Studies before the last year agreed that suicidality rates among physicians were undergoing a decreasing trend over time[20] so this makes the effects of COVID-19 even more important. Nevertheless, none of the studies included in this review attempted a comparison between suicidality and SI rates before and during the actual pandemic, therefore this is an important element that will need to be explored in the future.

The large number of studies that have emerged so far on the mental health of HCWs during the actual crisis has highlighted how HCWs, despite the presence of high levels of stress and alarming mental health symptoms, often do not seek help.[4-7] It seems that among the various suicidal theories, the tendency to underestimate the symptoms and favor self-treatment may have been the major causes of suicidality. In this regard, retrospective toxicology screening of suicide data evidenced that physicians are more likely than the general population to be positive for antipsychotics, benzodiazepines, and barbiturates.[17]

The studies reported in this review evidenced a range of SI that varies from 4 to 8 percent. Nevertheless, the studies are not comparable as they use different parameters for assessing SI. Three studies even use a single question and they do not discriminate between active or passive thoughts or plans. The studies also reported conflicting results. The Chinese study did not show gender differences whereas the Bangladesh study did. Only the Chinese study stratified the sample by work position, but no significant differences emerged.

What emerges in almost all studies is the greater vulnerability to SI in conditions of loneliness. These unnatural circumstances have been hypothesized to also lead to extreme risk-taking behaviors including suicidal tendencies. Social isolation and loneliness are recognized risk factors for suicidal attempts.[31-34] Consistently, being single and childless are factors associated with higher rates of SI. This is in line with the previous literature that highlights that individuals who are divorced or single have a higher risk for suicide and manifest higher levels of mental health problems, a loss of self-esteem and eventually a sense that life is not worth living.[35]

Forced and prolonged isolation might also exacerbate pre-existing conditions such as depression and anxiety. In literature, there is a significant association among depression, bipolar disorder, generalized anxiety disorder, and alcohol use disorder, with suicidal ideation, planning, and attempts.[35] Consistent with these observations, the other element that recurs as a predisposing factor to have SI is the presence of a present or past psychiatric disorder. Lockdown and boredom may unmask also susceptibility to unhealthy behavior, especially in the context of mood disorders. Alcohol use may lead to suicide by impairing judgment, increasing impulsivity, and by leading to mood disorders, cognitive deficits, anxiety, and psychotic disorders.[36] Studies describe a short-time deterioration and improvement at the symptomatic level in patients with mild psychiatric symptoms.[37-40] It is clear that the criterion of evaluation of the degree of distress associated with forced isolation depends on the clinical severity of the disorder in the present stage of its progress, but the risk that the same progress can be negatively influenced by the undergoing situation is in many cases real and this is also demonstrated by the reported anecdotal case reports.

This review should be considered of some limitations. First, the authors were unable to undertake a formal comparison between studies due to the heterogeneous nature of the evidence and the different tools used to explore suicide and SI. Although the mental health of HCWs has been widely analyzed in the last year, studies on SI in such populations are few and very different in methodology both in terms of the choice of an assessment scale for SI and in terms of sample stratification and outcomes. This prevents us from drawing robust evidence and highlights the importance of further research on this topic. Even considering the limitations mentioned above, this is the first study, to the best of our knowledge, that tried to shed some light on the suicidality of HCWs during the actual pandemic integrating studies evidence and media reports.

CONCLUSION

SI, and in worst cases suicide commitment, seem mental health outcomes not to be underestimated, especially in an emergency that is protracting. They require monitoring by health surveillance systems with a goal of prevention and support. The results highlighted the importance and severity of this issue and the fact that there are vulnerability elements.

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