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Original article

ANXIETY, INSOMNIA AND DEPRESSION DISORDERS AMONG HEALTHCARE WORKERS AFTER THE COVID-19 PANDEMIC: A PILOT STUDY

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ABSTRACT

The SARS-CoV-2 pandemic had a significant impact on the general population around the world, especially on health workers. Anxiety disorders, insomnia and depression were the main disorders that emerged in this occupational group during the COVID-19 pandemic, increasing the risk of medical errors and compromise patient safety. A total of 100 workers (OSS, obstetricians and nurses) from different regions of Italy was recruited and completed the ISI, GAD-7 and PHQ-9 questionnaires on an online survey platform. More than half of the health workers present with anxiety, depression and insomnia of varying degrees of severity. Research clearly shows a strong correlation between insomnia, anxiety and depression among healthcare workers. It also emphasises the need for healthcare organisations to implement comprehensive mental health support programmes, including education, counselling and access to mental health resources, to mitigate the negative impact on the well-being of healthcare workers.

1. Introduction

The SARS-CoV-2 pandemic had a significant impact on the general population around the world, especially on health workers who suffered the most [1,2]. The latter faced enormous challenges and burdens in the fight against the pandemic. The unrelenting pressure, fear of contagion, overwhelming workload and witnessing the suffering and death of patients have affected their mental health. Anxiety disorders, insomnia and depression were among the main disorders that emerged in this occupational group during the COVID-19 pandemic.

Anxiety disorders have become increasingly common among healthcare workers, having had to cope with the uncertainties and high-stress environment created by the pandemic [3,4,5]. Among anxiety disorders, the generalised anxiety disorder is a persistent and prevalent condition in which individuals experience continuous, non-specific worry and anxiety unrelated to recent stressful events, although some situations may exacerbate them. Manifestations of a systemic nature are also often present, including palpitations, hypertension, gastritis, dry mouth and sweating, etc [6]. The anxious state is characterised by a higher prevalence among women, twice as frequent as among men. There is significant overlap with symptoms found in other psychiatric disorders, suggesting that anxiety could be considered a component of a broad spectrum of mood disorders, rather than an independent condition [6].

In the specific case of the SARS-CoV-2 pandemic, the fear of contracting the virus and its variants, of transmitting it to one's loved ones, the impossibility of being able to move freely between healthcare facilities even for training purposes, the inadequacy of personal protective equipment (PPE), and the constant need to adapt to rapidly changing protocols and guidelines, all contributed to increased levels of psychological distress [7].

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Insomnia is the perception of inadequate, insufficient or non-restorative sleep and is the most common of all sleep disorders [8]. During the pandemic, demanding work schedules, excessively long and irregular shifts, and the constant influx of distressing news affected the normal sleep-wake rhythm [9-10].

Depression (also known as major depression, major depressive disorder or clinical depression) is a common but serious mood disorder [11]. It causes symptoms that affect the way a person feels, thinks and manages daily activities, such as sleeping, eating or working. Major depression includes symptoms of depressed mood or loss of interest, most of the time for at least 2 weeks, that interfere with daily activities [12].

During the pandemic, prolonged exposure to traumatic events, such as witnessing the suffering and death of patients, combined with feelings of helplessness and burnout, contributed to the development of depressive symptoms [13]. Constant pressure, long working hours and limited social support eroded their emotional well-being. Feelings of sadness, hopelessness, loss of interest in activities and difficulty in concentrating are some of the common symptoms displayed by health workers during this emergency period [13].

The impact of anxiety disorders, insomnia and depression on healthcare workers during the COVID-19 pandemic goes beyond their personal well-being. These mental health problems can compromise the ability to provide quality patient care, increase the risk of medical errors and compromise patient safety. Moreover, the repercussions of untreated mental health problems among healthcare workers may have long-term consequences, affecting overall job satisfaction and professional longevity [14].

The aim of our study was to conduct an analysis, using questionnaires validated by the scientific community, on the prevalence of psychological disorders such as depression, anxiety and insomnia among shift workers in the period immediately following the end of the COVID-19 pandemic.

2. Material and methods

The study was conducted from February 2023 to May of the same year. The sample selected originally included 120 shift workers (OSS, obstetricians and nurses) in service at various hospital facilities located throughout the country such as: ARNAS Civico Di Cristina Hospital (Palermo), "Paolo Giaccone" University Hospital of Palermo, Local Health Agency of Palermo, Buccheri La Ferla Hospital of Palermo, Villa Sofia-Cervello Hospital, Karol healthcare residence of Villabate, Sette Laghi Local Health Agency of Varese and Valle Olona Local Health Agency of Gallarate.

Considering that 20 of these refused to participate in the study, a total of 100 subjects were recruited. The participants completed the ISI (Insomnia Severity Index), GAD-7 (General Anxiety Disorder-7) and PHQ-9 (Patient health questionnaire-9) questionnaires on an online survey platform Google Form [15]. The order of the questionnaires was counterbalanced to minimise any potential order effects. Clear instructions were provided for each questionnaire to ensure that participants understood how to accurately assess their symptoms.

The inclusion criterion for participants was employment in a healthcare environment with night shifts during the pandemic emergency period.

The following scales were used to assess the possible presence and severity of insomnia, generalised anxiety disorder and depression:

- Insomnia Severity Index
- General Anxiety Disorder-7
- Patient health questionnaire-9

Insomnia Severity Index (ISI) [16]: Information on sleep disturbances was collected through the administration of the Insomnia Severity Index (ISI) questionnaire; a valuable tool for understanding the nature, severity and impact of insomnia. The test covers the last 30 days and the parameters assessed are: severity of sleep onset problems, sleep maintenance and morning awakening, sleep dissatisfaction, interference of sleep difficulties with normal daily activities, perception of sleep problems by others, and distress caused by poor and unsatisfactory sleep. This instrument consists of a survey of 7 items (5 potential answers each) with a total score ranging from 0 (no problem) to 4 (very serious problem). The total score is interpreted as follows: no insomnia (0-7); subthreshold insomnia (8-14); moderate insomnia (15-21); severe insomnia (22-28).

Generalised Anxiety Disorder - 7 (GAD-7) [17]: For the assessment of anxiety disorders in our sample, the Generalized Anxiety Disorder - 7 (GAD-7) was administered; a standardised and validated anxiety screening test used to assess the severity of Generalised Anxiety Disorder. It is a self-administered questionnaire consisting of 7 items, rated on a 4-point Likert scale (0-3), which correspond to anxiety symptoms according to the DSM-IV (APA, 1994) [18]. The score has a range between 0-21. The scores 5,10,15 are defined as cut-off points for the assessment of medium, moderate or severe anxiety, respectively.

Patient Health Questionnaire-9 (PHQ-9) [19]: The Patient Health Questionnaire-9 (PHQ-9), a validated instrument for screening, diagnosing, monitoring and measuring the level of severity of major depressive disorder, was used for depressive disorder. The PHQ-9 consists of 9 items that correspond to the symptoms of major depression according to the DSM- V TR. The score has a range between 0 and 27. Scores between 0 and 9 indicate the presence of sub-threshold depression. A score of 10 is indicated as the point at which the sensitivity and specificity of the instrument are recognised as optimal for detecting depressions of clinical relevance.

Prior to data collection, participants were given an informed consent form explaining the purpose of the study and the measures provided for participants' rights and protections. Participants were given ample time to read and understand the consent form and were encouraged to ask any questions before giving their informed consent.

Data analysis was conducted with the aid of the GraphPadPrism 8.01 statistical software package (GraphPad Company, San Diego, CA, USA) [20]. Specifically, a descriptive analysis of the data such as averages and standard deviations was carried out in order to define the various levels of insomnia, depression and anxiety in the study population through the evaluation of the scores obtained. Furthermore, the correlation between sleep disorders and the various degrees of anxiety and depression was assessed using Pearson's correlation coefficient test [21]. Simple linear regression analyses were generated as predictive models to assign the correlation found.

3. Results

100 OS shift workers were recruited from among obstetricians, OSSs and nurses of both sexes (Figure 1) who perform different work activities including night shifts for at least 50 nights per year, with socio-demographic differences (Figure 2 and Figure 3).

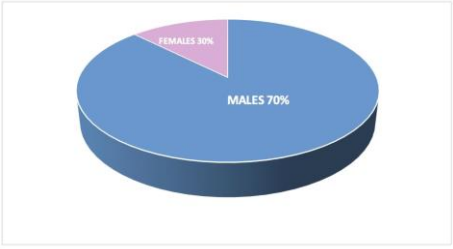

Figure 1. Distribution of the sample according to gender

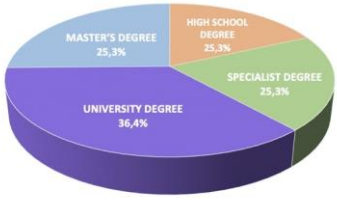

Figure 2. Distribution of sample according to education level

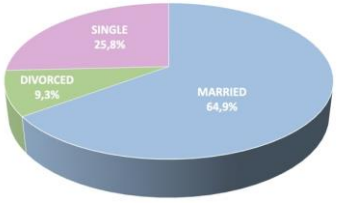

Figure 3. Distribution of sample according to marital status

Insomnia disorders in the general population

The analysis of the data from the ISI test revealed that, within the population under evaluation, there are different subjects who suffer from insomnia. Specifically, the results obtained through descriptive data analysis revealed that 41 (41%; ISI 4.585, CI 3.982 - 5.188) have no insomnia problems, 40 (40%; ISI 11.08, CI 10.45 - 11.70) have subthreshold insomnia, 15 (15%; ISI 17.60, CI 16.35 - 18.85) have moderate insomnia and 4 (4%; ISI 25.50, CI 22.45 - 28.55) were found to have severe insomnia problems (Table 1).

	n°	%	INSOMNIA SEVERITY INDEX MEAN	95% CI
Sample Total	100	100	9.970	8.799 - 11.14
No clinically significant insomnia	41	41	4.585	3.982 - 5.188
Subthreshold insomnia	40	40	11.08	10.45 - 11.70
Moderate insomnia	15	15	17.60	16.35 - 18.85
Severe insomnia	4	4	25.50	22.45 - 28.55

Table 1. Data on the degree of insomnia in our study sample.

Depressive disorders in the general population

The analysis of the data from the PHQ-9 test showed how, within the population under assessment, there are different subjects who suffer, to varying degrees, from depressive disorders. In detail, the results obtained through the descriptive analysis of the data showed that the majority of the test population developed depressive disorders of varying degrees compared to those without a clinically relevant disorder. The data are shown in the table (Table 2).

	n°	%	PATIENT HEALTH QUESTIONNAIRE-9	95% CI
Sample Total	100	100	8.070	6.735 - 9.405
No clinically significant depression	35	35	2.000	1.454 - 2.546
Subthreshold depression	33	33	7.182	6.677 - 7.687
Lower depression	19	19	11.16	10.72 - 11.59
Moderate depression	4	4	16.75	14.36 - 19.14
Severe depression	9	9	24.56	22.38 - 26.73

Table 2. Data on the severity of depressive disorder in our study sample

Anxiety disorders in the general population

The analysis of the data from the GAD-7 test revealed that there are different subjects with generalised anxiety disorder within the population being assessed. In detail, the results obtained through the descriptive data analysis showed that there is a good percentage of subjects who developed moderate to severe anxiety compared to those with mild anxiety (Table 3).

	n°	%	GENERAL ANXIETY DISORDER-7	95% CI
Sample Total	100	100	8.020	7.004 - 9.036
Minimal Anxiety	29	29	2.310	1.725 - 2.895
Mild Anxiety	34	34	6.824	6.349 - 7.298
Moderate Anxiety	27	27	12.07	11.49 - 12.65
Severe Anxiety	10	10	17.70	16.19 - 19.21

Table 3. Data on the degree of anxiety in our study sample

Evaluation of correlations between ISI and PHQ-9

In order to understand whether subjects with different degrees of depression suffered from sleep disorders at the same time, a statistical analysis was conducted using Pearson's correlation coefficients between the ISI scores and those obtained from the PHQ-9. The statistical analysis revealed a significant association between sleep disturbances and various degrees of depressive disorders in the sample we analysed ($r = 0.7116$, CI 0.5989 - 0.7967, $p < 0.0001$) (Figure 4).

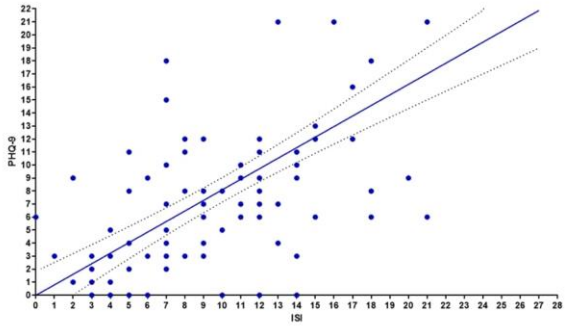

Figure 4. Association between sleep disturbances and various degrees of depressive disorders in the sample

Evaluation of correlations between ISI and GAD-7

The correlation between sleep disorders and the presence of the various degrees of anxiety was also assessed in order to understand the influence of anxiety on sleep quality. Statistical analysis was conducted using Pearson's correlation coefficients between the ISI scores and those obtained from the GAD-7 and revealed a significant association between sleep disorders and the various degrees of anxiety in the sample we analysed ($r = 0.5334$, CI 0.3764 - 0.6606, $p < 0.0001$) (Figure 5).

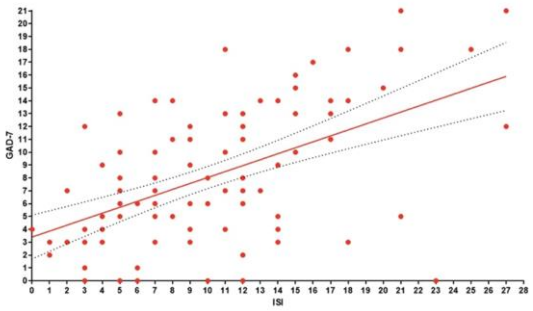

Figure 5. Pearson's correlation coefficients between the ISI scores and those obtained from the GAD-7

4. Discussion

Overall, this study aimed to assess the presence and degree of severity of depression, insomnia and anxiety in healthcare workers using the Insomnia Severity Index (ISI), the Generalised Anxiety Disorder-7 (GAD-7) and the Patient Health Questionnaire-9 (PHQ-9). Data collected from these measures were analysed to examine the relationships between these variables and provide valuable insights into the mental health of healthcare workers.

For many months, the attention of the scientific community has focused on the routes of transmission of the virus, its variants and the effects on the infected organism, neglecting the psychosocial outcomes of the epidemic in both the population and healthcare workers [24]. The COVID-19 pandemic has led to a condition of stress quite different from that secondary to an acute and circumscribed traumatic event: it is a condition that is both individual and collective, sub-acute but persistent, ascribable to a negative stimulus protracted over time, strongly disorienting.

As also confirmed in our sample, more than half of the health workers present with anxiety, depression and insomnia of varying degrees of severity.

Long shifts and procedures with a higher risk of contamination forced health workers to maintain a high state of alertness during all shifts, triggering these psychological disorders.

Insomnia and depression are two complex and interconnected conditions that often coexist and influence each other, as also shown in our analysis sample [25]. The correlation between insomnia and depression is bidirectional: each condition can contribute to and aggravate the other. Insomnia can be both a symptom and a risk factor for depression. Sleep disorders interrupt the normal sleep-wake cycle and can lead to emotional dysregulation, increased vulnerability to stress and reduced ability to cope with life's challenges. Chronic sleep deprivation can also affect the neurochemical balance of the brain, including serotonin, which plays a key role in mood regulation [26].

These factors increase the likelihood of developing depression or worsening existing depressive symptoms.

Similarly, depression may contribute to the development or exacerbation of insomnia [27]. Psychological and genetical factors associated with depression, such as excessive worrying, rumination and negative thought patterns, may interfere with falling asleep and maintaining restorative sleep. In addition, alterations in circadian rhythms and perturbations of the brain's stress-response system, often observed in individuals with depression, may further contribute to sleep disturbances [28].

The interaction between insomnia and depression creates a cycle of negative reinforcement. Insomnia can intensify depressive symptoms, such as low mood and decreased motivation, while depression can perpetuate and worsen sleep problems [27]. This cycle can make it difficult for people to break free from the grip of both disorders, leading to a significant decline in overall quality of life.

Recognising the correlation between insomnia and depression is essential to develop effective treatment strategies. Treatment of one condition may often entail treatment of the other. In some cases, treating insomnia alone may alleviate or improve depressive symptoms.

However, insomnia is also linked to generalised anxiety disorders [27]. The analysis of correlation coefficients within our sample showed a significant connection between the two pictures. Insomnia and generalised anxiety disorder often coexist and can exacerbate each other, creating a vicious circle. The anxious thoughts and excessive worrying associated with generalised anxiety disorder can make it difficult to relax and fall asleep, leading to insomnia. Conversely, the lack of sleep and fatigue resulting from insomnia can increase anxiety levels, making it even more difficult to manage anxious thoughts and emotions.

5. Conclusions

In conclusion, the study on the correlation between insomnia, anxiety and depression among healthcare workers sheds light on the significant mental health challenges faced by this particular group during the pandemic period. The results of the study highlight the interconnectedness of these three conditions and underline the need for targeted and supportive interventions for healthcare workers.

Research clearly shows a strong correlation between insomnia, anxiety and depression among healthcare workers. The demanding nature of their work, long working hours, exposure to traumatic events and the constant pressure to provide optimal patient care all contribute to increased levels of stress and psychological distress. Insomnia acts as a common precursor to anxiety and depression, increasing the risk of developing these conditions among healthcare workers.

The study emphasises the importance of recognising and addressing the mental health problems of healthcare workers. Insufficient sleep, combined with high levels of anxiety and depression, can have detrimental effects on both the individual health worker and the quality of care provided. The findings emphasise the need for healthcare organisations to implement comprehensive mental health support programmes, including education, counselling and access to mental health resources, to mitigate the negative impact on the well-being of healthcare workers.

Prioritising mental health within the health system is crucial, not only for the well-being of health workers but also for the overall improvement of the care provided to patients. Therefore, allocating resources to implement policies that address the mental health needs of health workers can contribute to a more sustainable and resilient workforce, benefiting the quality of health care delivered.

During the data analysis process, the privacy and confidentiality of participants was maintained. All identifying information was removed or anonymised to ensure the protection of participants' identities. The research team adhered to the guidelines and regulations stipulated in the GDPR in the handling and analysis of the data [22,23].

It is important to recognise the limitations of the data analysis. The small sample size and the cross-sectional nature of the study may limit the ability to establish causal relationships between stress, insomnia and anxiety symptoms. Second, the study relied on self-report measures, which are subject to recall bias and social desirability effects. Future research should address these limitations by including diverse populations, using objective measures and employing longitudinal designs.

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