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Exploring healthcare workers' perceptions and experiences regarding post-traumatic stress disorder after 2 years of the last global pandemic

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Abstract

Background The adverse mental health consequences of the coronavirus epidemic for healthcare workers (HCWs) affect the quality of care and patient satisfaction; HCWs need to maintain good mental health during and after an epidemic, especially in low-income countries like Iran, where human resources in the health care sector are insufficient. The aims of this study are to explore the perceptions and experiences of healthcare workers regarding post-traumatic stress disorder (PTSD) after 2 years of the last Global Pandemic.

Methods We conducted the present study in Mazandarn province, Iran, using a qualitative approach based on conventional content analysis. Participants were Iranian healthcare workers (HCWs) aged 30 and above, all with a history of post-traumatic stress disorder (PTSD) symptoms. Eligible candidates were selected through both purposive sampling (with maximum variation) and snowball sampling to ensure diversity in demographic characteristics and lived experience of phenomena. Data were collected through in-depth, semi-structured interviews, continuing until data saturation was reached. The interviews were analyzed using MAXQDA10 software, following the conventional content analysis approach as outlined by Graneheim and Lundman.

Results Our analysis yielded five main themes and 18 categories: [1] Helplessness, including six categories: physical consequences, psychological reactions, feeling of guilt, job-related consequences, social consequences, and lack of support; [2] poor risk management, encompassing four categories: inadequate vocational skills training, poor anger management, low sense of security, and hazardous work environments; [3] life and death experience, with two categories: hopelessness about life and the future, and witnessing unexpected deaths; [4] seeking support, comprising three categories: social support, psychological support, and organizational support, and [5] self-care, involving three categories: personal responsibility for health, maintaining a healthy lifestyle, and building resilience against PTSD.

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Conclusion Our findings reveal a concerning picture of the mental health status of Iranian HCWs, particularly regarding the impact of the most recent pandemic. Many participants reported significant symptoms of stress, depression, anxiety, and PTSD, all of which profoundly affect their overall well-being. The most prominent themes identified were feelings of helplessness, inadequate risk management, encounters with life-and-death situations, and insufficient support systems. Alarming, several HCWs expressed intentions to leave their current positions or exit the healthcare profession altogether. Such trends pose a serious threat to the stability of Iran's healthcare system. Consequently, proactive, solution-oriented strategies must be developed—both at the national level and in collaboration with international stakeholders—to mitigate the ongoing healthcare workforce shortage in Iran and address the broader global risk of healthcare service disruption.

Keywords PTSD, Healthcare workers, Pandemic, Qualitative

Introduction

Acute respiratory syndrome coronavirus (COVID-19), caused by a new and highly contagious virus, was first identified in December 2019 in Wuhan, China. On March 11, 2020, the World Health Organization (WHO) declared the outbreak of COVID-19 as a global pandemic [1]. Since the first cases were identified in 2019, more than 700 million people were infected and 6 million deaths have been reported worldwide by May 2023 [2]. In addition to its unfavorable effects on physical health, the COVID-19 pandemic has been associated with an increase in psychological problem such as emotional suffering related to stressful factors and demands that are difficult in daily life- and harmful effects on mental health [3, 4]. Stressful events such as the coronavirus pandemic have a notable impact on mental health and can lead to situation such as post-traumatic stress disorder (PTSD) and depression [5, 6]. Studies based on a similar outbreak of SARS in 2003 showed that during the epidemic, different groups of people, from the general public to HCWs, experienced different levels of psychological problems such as worry, anxiety, PTSD, and depression [5].

The Chinese Center of Disease Control reported that during the outbreak of COVID-19 from February 11, 2020, out of 44,672 confirmed cases of coronavirus, 1,716 were HCWs, indicating a high risk of infection among them. Consequently, HCWs are exposed to severe stress. Medical staff at the forefront of the fight against COVID-19, showed a higher risk of depression, anxiety, insomnia, and confusion, and this indicates that there are serious concerns about psychological well-being of health personnel during and after the outbreak [7]. An epidemic outbreak of an unknown new infection, a continuous increase in infected cases, rising mortality, and the lack of specific drugs or effective medical treatments can be defined as an acute or chronic traumatic experience. The fear of transmitting the disease to others or increasing the number of deaths from the disease is a threat to individuals, which can lead to increased incidence of sleep disorders and mood, psychological, and mental disorders. Therefore, HCWs face critical conditions during the

global pandemic, increasing the risk of mental disorders [8]. In addition to focusing on non-specific depression and anxiety, as well as general stress, previous research has examined the impact on PTSD symptoms [9]. Evidence shows a higher prevalence of PTSD in HCWs compared to the general population through epidemics such as COVID-19 [9, 11], with prevalence ranging from 7.4 to 35%. Prior to the pandemic, it was estimated that approximately 7–19% of HCWs exposed to workplace trauma developed PTSD. However, recent data from the Mental Health Index reveal a dramatic increase in PTSD risk among the workforce, with a 121% rise since 2020—including a 36% increase in 2022 alone [3, 9, 12, 13].

The DSM-5 defines PTSD as “frequently experiencing or intense exposure to unpleasant details of a traumatic event(s),” which can be considered potentially traumatic events. Although most individuals show resilience after exposure to traumatic events, several risk factors may compromise adaptation, including prior psychiatric history, female gender, absence of social support, and having young children [10]. During epidemics, a high percentage of HCWs (up to 1 in 6 of those caring for affected patients) exhibit adjective stress symptoms [10]. HCWs, particularly, during and after the COVID-19 pandemic face difficult conditions associated with the pandemic, including increased mortality, increased workload and working hours, shortages of tools, resources, and worry about receiving and transmitting COVID-19 to loved ones. This type of exposure increases the risk of negative psychological outcomes such as acute stress, depression, sleep problems, insomnia, job burnout, post-traumatic stress disorder, depression, and anxiety [14]. Therefore, the psychological impact of this epidemic and especially PTSD among HCWs, including doctors and nurses, has become increasingly important [10].

Various studies have been conducted in this field. For an example, relatively high prevalence rates of PTSD among nursing populations have been reported during the COVID-19 pandemic in twenty-six different countries worldwide [15]. In China, a cross-sectional survey

of HCWs found higher prevalence of depression, anxiety, and PTSD [3]. A study in Norway found higher prevalence of PTSD symptoms in health care workers and general service providers [16]. Another study showed high prevalence of PTSD in intensive care unit nurses [17]. A study in Iran reported that both PTSD and burnout are common among nurses [18]. Consequently, minimizing the psychological effects of this disease on HCWs is a particular challenge for health care systems worldwide [8]. Given the limited information from previous studies, more research is required to recognize the psychological impact of the COVID-19 epidemic [5].

The adverse mental health consequences of this epidemic for HCWs affect the quality of care and patient satisfaction. Conversely, maintaining good mental health is crucial for HCWs during an epidemic, especially in a low-income countries like Iran, due to insufficient human resources in the healthcare sector [19]; Considering the valuable role of qualitative research in describing and understanding behaviors in the social context [20], and the limited knowledge regarding HCWs perception and experience of PTSD caused by COVID-19, this study aims to explore the perceptions and experiences of HCWs regarding PTSD after 2 years of last Global Pandemic. The findings of this research provide evidence for designing appropriate interventions for PTSD in health care workers in possible future pandemics.

Methods

This qualitative study employs a conventional content analysis approach to explore the perceptions and experiences of healthcare workers (HCWs) regarding post-traumatic stress disorder (PTSD) resulting from the most recent global pandemic. In alignment with the project's objectives, this method allows for a comprehensive understanding of the issue and facilitates an in-depth examination of the impact of the pandemic on the mental health of Iranian HCWs experiencing PTSD.

Study design and participants

A qualitative method was applied in present study. Participants were recruited from public and private hospitals, medical education centers, and health clinics in Sari, Mazandaran Province, Iran. To ensure a diversity of perspectives, participants were selected using both purposive sampling (with maximum variation) and snowball sampling techniques. These methods were employed to capture variation in demographic characteristics and experiences related to the phenomenon under investigation [21]. Purposive sampling is a technique in which individuals are selected based on their specific experiences that are relevant to the research objectives [22]. This approach was particularly appropriate for the current study, as the aim was to explore the specific

experiences of healthcare workers (HCWs) employed in the open labor market.

Although most participants were recruited through purposive sampling, the process began with an initial interview with one healthcare worker (HCW) who met the study's inclusion criteria. This individual was then asked to refer other HCWs who might also meet the criteria and be suitable for participation. Thus, aside from the first few participants who were directly selected by the primary investigator, subsequent participants were included through a combination of purposive and snowball sampling, based on their experience with the phenomenon under investigation.

To identify individuals exhibiting symptoms of post-traumatic stress disorder (PTSD), the research team first selected participants who met the general inclusion criteria. These individuals were then assessed using the Beck Depression Inventory (BDI), the PTSD Checklist for DSM-5 (PCL-5), and the Impact of Event Scale-Revised (IES-R). Those who scored above the clinical cut-off on these instruments were referred to a psychiatrist to confirm the presence of PTSD symptoms and determine their eligibility for the study. Given that the study was conducted in hospitals, medical education centers, and clinics, coordination for psychiatric consultation was readily available. Participants who were confirmed by the psychiatrist to exhibit PTSD symptoms proceeded to the main phase of the study, which involved a semi-structured interview.

To ensure a broad range of perspectives, the principle of maximum variation sampling (also referred to as a "heterogeneous sampling method") was applied. This approach was used to capture variation across several dimensions, including socioeconomic status, gender, age, PTSD symptomatology, work experience, professional role, and educational background. Snowball sampling was employed on a case-by-case basis by encouraging enrolled participants to refer colleagues who might also be interested in participating.

At the outset of the study, the purpose of the research was clearly explained to each candidate. Interviews were conducted until data saturation was achieved—that is, when responses became repetitive and no new codes or themes emerged from the data.

Participants were eligible for inclusion if they met all of the following conditions: [1] Currently employed within the healthcare system in Iran [2], Exhibiting symptoms of post-traumatic stress disorder (PTSD) related to COVID-19, as determined by elevated scores on the Beck Depression Inventory (BDI), the Impact of Event Scale-Revised (IES-R), the PTSD Checklist for DSM-5 (PCL-5), and confirmation via psychiatric evaluation (including physical and mental health assessments) [3], Willing to participate in the study voluntarily [4], Having at least one

year of full-time work experience in healthcare centers in Mazandaran Province during the COVID-19 pandemic [5], Not suffering from serious physical illnesses (e.g., chronic pain, cancer, epilepsy) [6], Demonstrating a basic theoretical understanding of the study topic, and [7] Representing a diverse background and expressing willingness to participate.

Participants were excluded if they worked primarily in remote roles during the pandemic (e.g., delivering online case management or telehealth services).

Data collection

After obtaining the necessary ethical approvals and institutional permissions, participant recruitment and data collection began. The primary method of data collection was semi-structured, in-depth interviews using open-ended questions. Interviews were conducted by two authors (MK-P and FY), both of whom received professional training in qualitative research methods through multiple workshops and have extensive experience in designing and conducting high-quality qualitative interviews. Their training included developing interview guides and refining interview techniques to suit different populations and research topics.

To gather rich and comprehensive data, interviews were guided by a semi-structured protocol. The interview guide was developed based on an extensive review of the relevant literature [23–26] and insights from researchers in related fields. It was piloted with three participants to ensure clarity and relevance. The guide was designed to encourage participants to share their views and experiences related to PTSD, particularly in the aftermath of the COVID-19 pandemic, two years after the global crisis.

The interview guide included the following sections: (1) demographic characteristics of participants; (2) the different types of mental disorders in HCWs [especially during COVID-19]; (3) factors causes on PTSD in HCWs especially during COVID-19; (4) identifying risk factors related to the PTSD in HCWs [especially during COVID-19]; (5) the symptoms of PTSD in HCWs especially during COVID-19; (6) experience with PTSD related to COVID-19 stress in HCWs; (7) mitigating factors of PTSD symptoms in HCWs [especially during COVID-19]; (8) the strategies and methods for reducing and coping with PTSD related to COVID-19 stress; and (9) types of interventions helped PTSD symptoms. The interview guides are presented in Appendices 1–4.

Semi-structured in-depth interviews (IDIs)

A total of 24 healthcare workers (HCWs) voluntarily participated in semi-structured interviews. Sampling continued until data saturation was reached—that is, when no new codes or relevant information emerged

from the data. For additional confirmation of saturation, interviews were conducted with three more participants beyond the point at which saturation was first observed, completing the dataset at 24 interviews.

At the start of each interview, participants were asked to provide demographic information and reflect on any personal or contextual factors that might have influenced their experience with the study topic. After establishing initial rapport, interviews began with a broad, open-ended question: “*What do you think about PTSD related to COVID-19 stress among healthcare workers?*” This was followed by progressively more specific questions focused on contributing factors, symptoms, and strategies for coping with or reducing PTSD symptoms. Participants were encouraged to describe their personal experiences with PTSD symptoms related to COVID-19 stress and to elaborate on the strategies they had used to manage or mitigate these effects. They were also invited to reflect on the factors that may have influenced their ability to apply these coping strategies.

The interviewers adapted the discussion based on each participant’s responses. When needed, in-depth and follow-up questions were used to clarify or expand upon specific points raised by the participants. For example, prompts such as “*What do you mean by that?*” or “*Could you elaborate on that point?*” were used to encourage deeper reflection. This approach allowed for flexibility and responsiveness while maintaining a focus on the core research themes. A sample interview guide has been included as a supplementary file.

To protect participant confidentiality, each interview was anonymized using a numerical code (e.g., Participant 1 through Participant 24). All interviews were conducted individually and lasted between 45 and 60 min, depending on the participant’s availability and willingness to share. Interviews were conducted by the first and third authors, both of whom are experienced in qualitative research methods.

With participants’ consent, all interviews were audio-recorded and transcribed verbatim in Farsi. In cases where participants declined to be recorded, detailed handwritten notes were taken and subsequently transcribed. All transcripts and recordings were double-checked for accuracy. Interviews were scheduled at a time and location convenient to each participant. In addition to verbal responses, interviewers also noted relevant non-verbal cues, such as facial expressions, tone of voice, and emotional states, as well as contextual details like date and location.

Data analysis

Immediately following data collection, the coding and analysis process began. A conventional content analysis

approach, as described by Graneheim and Lundman [21], was used to identify emerging themes and subthemes that reflected participants' perceptions and experiences related to PTSD symptoms associated with COVID-19 stress. This method relies on inductive reasoning, allowing categories and conceptual structures to emerge directly from the raw data, without imposing predefined theoretical frameworks.

According to Graneheim and Lundman, qualitative content analysis involves examining both the manifest (explicit) and latent (implicit) content of interview data. This dual focus makes it possible to interpret underlying meanings that are not immediately evident in the text [21].

Coding categories in this approach are developed directly from the transcribed data through a process of close reading, comparison, and abstraction. The researchers engaged in a rigorous process of data familiarization, which included listening to each interview multiple times, transcribing them verbatim, and carefully reviewing the transcripts. Each transcript was assigned line numbers to facilitate referencing during the coding process. Transcriptions were compared against the original audio recordings to ensure accuracy. Key quotations reflecting the core phenomenon under study were identified, and their meanings were interpreted to generate initial meaning units. These meaning units were then condensed and assigned descriptive codes. This coding process was conducted iteratively. Initial codes were generated manually during the early stages of analysis. Two researchers (MK and FY) independently reviewed the transcripts and developed preliminary codes through open coding. These were then compared and refined through discussion. Once a coding structure had been clearly established, the remaining transcripts were coded using both manual techniques and the MAXQDA software (version 10), which enabled efficient organization and retrieval of coded segments. The next stage involved grouping similar codes into subcategories. Related subcategories were then clustered to form broader categories. Finally, categories with shared underlying concepts were synthesized into overarching themes. This hierarchical process led to the development of a structured thematic framework consisting of subcategories, categories, and main themes. Throughout this phase, themes were continually refined. Ambiguous or overlapping codes and themes were re-examined, merged, split, or eliminated as necessary. The naming of subcategories, categories, and main themes was guided by the scope and nature of the underlying codes they represented. Latent themes, once identified, were polished and finalized through collaborative discussions

among the research team. The final themes were used to structure the presentation of the study's findings.

Rigor of the data

The rigor of data collection and analysis in this study was ensured by addressing four key criteria of trustworthiness: credibility, confirmability, transferability, and dependability.

Credibility was enhanced through prolonged engagement with the data, member checking, and peer debriefing. To ensure a robust interpretation, we consulted an additional coder trained in qualitative methods. Furthermore, five participating HCWs were asked to review their interview transcripts, summaries of the interviews, and the preliminary findings. These participants were selected based on their initial involvement in the interviews and provided feedback to validate the accuracy and authenticity of the researchers' interpretations (member checking). Confirmability was established through peer checking. The coding schemes and emerging themes were reviewed by four independent researchers with expertise in qualitative content analysis, ensuring that the findings were grounded in the data and not influenced by researcher bias. Transferability was supported by the use of maximum variation sampling to include participants with diverse backgrounds and experiences. Additionally, we provided a detailed description of the study context, methodology, and sampling procedures [23]. Dependability was ensured through transparent and systematic coding procedures, including the documentation of coding decisions and inter-coder agreement [24]. All interviews were conducted and analyzed in Farsi to preserve the nuances of participants' expressions. The codes and final themes were translated into English for reporting purposes. Throughout this process, great care was taken to maintain the accuracy and meaning of participants' narratives across languages.

Ethical considerations

This article is a part of a research project with ethics code IR.MAZUMS.REC.1402.476. Written and oral informed consent was obtained from the participants prior to participate in the study. All interviews were audiotaped and transcribed with the participant's consent.

Results

In present study, 24 HCWs were included. The characteristics of the participants are presented in Table 1. Data analysis led to the emergence of 1036 primary codes. Because of the large number of emerged concepts, only the concepts related to all the interviews, which included 348 codes, were considered. In the coding process in the open stage, keywords of the study were recognized. Generally, five major themes emerged from the analysis:

Table 1 Socio-demographic features of the participants (N: 24)

Variable	Domain	Frequency	Percentage
Sex	Women	13	54.2
	Men	11	45.8
Age	30–34 y	9	37.5
	35–39 y	8	33.3
	40 and more	7	29.0
Education level	Bachelor’s degree	10	41.7
	Masters and Ph.D.	7	29.2
	Medical Doctor	5	20.8
	Specialist	2	8.3
Place of employment	Hospital	15	62.5
	Health clinic	9	37.5
Work experience	< 5y	6	25.0
	5–10 y	10	41.7
	> 10y	8	33.3

Table 2 Main themes and categories extracted from present qualitative study

Main themes	Categories
Helplessness	Physical consequences
	Psychological reactions
	Feelings of guilt
	Job-related implications
	Social consequences
	Lack of support
Poor risk management	Inadequate vocational skills training
	Poor anger management
	low sense of security
	Hazardous work environments
Life and death experience	Hopelessness about life and the future
	Witnessing unexpected deaths
Seeking support	Social support
	Psychological support
	Organizational support
Self-care	Health responsibility
	Maintaining a healthy lifestyle
	Building resilience against PTSD

(1) helplessness; (2) poor risk management; (3) life and death experience; (4) seeking support; and (5) self-care. More information on themes, categories, and sub-categories can be found in Table 2. In the following section, we describe HCWs’ experiences. More information on the themes, categories, and sub-categories is available in Tables 3, 4, 5, 6 and 7. In the following section, we disclose the HCWs’ experiences of the major themes. [Tables 3, 4, 5, 6 and 7].

Theme 1: helplessness

This main theme helplessness caused by the PTSD consists of six categories: physical consequences, psychological reactions, feeling of guilt, job related consequences, social consequences, and lack of support (Table 3).

Physical consequences (PC)

For several participants, the physical consequences of trauma were closely linked to their post-traumatic stress symptoms. They reported a range of physical health issues, including poor sleep quality, nightmares, extreme fatigue, changes in sexual functioning, self-destructive behaviors (e.g., smoking, alcohol use, or reckless driving), loss of appetite, lethargy, persistent boredom, and a general loss of energy. One participant described the lingering impact on her physical health in the following way:

“[The major problem] with my health [after COVID-19 pandemic]? I have a sleep disorder and insomnia, and I just can’t bear it... My tolerance is so low now... I feel tired and completely exhausted—again and again—because of this extreme fatigue and lack of sleep.” (Participant)

The other said that:

“I don’t sleep well at all. The stress at that time. The deaths we had. The fear of illness. All this caused high stress. Does one forget it easily? How can I sleep comfortably?” (Participant 7)

Respondents also reported that the COVID-19 pandemic significantly disrupted their sexual relationships, with several attributing a decline in sexual functioning to feelings of despair and helplessness in the post-pandemic period. One participant described the emotional strain on her relationship as follows:

“For 11 months after COVID-19, my husband was always unhappy about our sexual relationship... I had little sexual need or desire while at home... My husband is very unhappy with life... This has caused us to distance ourselves from each other...” (Participant 24)

For many individuals with PTSD symptoms, transitioning out of the COVID-19 period remains extremely challenging. Persistent physical symptoms—such as sleep disturbances, chronic fatigue, sexual dysfunction, and low energy levels—not only prolong psychological distress but also contribute to continued substance use and undermine motivation to begin recovery.

Table 3 Categories and sub-categories of the theme of helplessness

Theme	Category	Sub-category	
Helplessness	Physical consequences	Poor sleep quality	
		Nightmares	
		Extreme fatigue	
		Change in sexual function	
		Self-destructive behaviors such as smoking, drinking, or driving	
		Loss of appetite	
		Lethargy and boredom	
		Loss of energy	
		Psychological reactions	Lack of calm
			Fear and panic of getting sick (Perceived vulnerability)
	Fear of transmitting disease to others (family members, people,...)		
	Suicidal thoughts		
	Feeling helpless in coping with the situation		
	Lack of self-confidence		
	Obsessive-compulsive		
	Constant feeling of stress, depression, and anxiety		
	Declining life satisfaction		
	Intrusive memories		
	Feelings of guilt	Uncontrollable thoughts about negative events	
		Loss of normality and balance of daily life	
		Pervasive fear of strangers and closest relatives	
		Guilt towards infecting family,	
		Guilt towards lack of knowledge,	
	Job-related implications	Guilt towards wasting time	
		Feeling guilty towards non-saving patients	
		Hesitation, desire, or intention to change jobs	
		Burnout	
		Declining job satisfaction	
		Financial problems, and loss of income and job	
		Work-life imbalance	
Overwhelming workload			
Decreased work quality			
Limitations or inability to handle the work			
Social consequences	Disability and early retirement		
	Defective interpersonal relationships with patients		
	Social stigma and rejection by the patient's family		
	Taunting and humiliation of the patient's family		
	Cutting off contact between those around you and the patients' families		
Lack of support	Reduced social relationships with friends and acquaintances		
	Decreased intimate social relationships with family		
	Feeling forgotten and socially excluded		
	Feeling lonely, seclusion, and worthless to others		
	Lack of professional requirements		
	Lack of personal protection equipment or insufficient number		
	Lack of financial resources		
	Lack of human resources		
	Inadequate preparation to deal with the next epidemic		

Psychological reactions

Psychological reactions to the COVID-19 pandemic were profound and multifaceted among participants. Many described experiencing a wide range of symptoms, including guilt and self-blame, restlessness, perceived

vulnerability, fear of contracting the virus, and fear of transmitting it to others, especially to close family members. Additional reported symptoms included suicidal ideation, feelings of helplessness, low self-confidence, obsessive-compulsive behaviors, chronic stress,

Table 4 Categories and sub-categories of the theme of poor risk management

Theme	Category	Sub-category
Poor risk management	Inadequate vocational skills training	Lack of training on the subject of coronavirus
		Lack of procedures for caring for a patient with COVID-19
		Little information about the virus itself
		Failure to communicate with the patient
	Poor anger management	Lack of practical and scientific training
		Inability to control the situation
		Inability to manage patients' panic
	Low sense of security	Immediate emotional reaction
		Reducing close contact with infected or suspected patients
		Feeling insecure about stigma
		Aggressive behavior of the patient and companions
	Hazardous work environment	Feeling insecure about infecting loved ones
Uncertainty about the consequences of mandatory social isolation		
Insecurity due to death statistics,		
Exposure to physical attacks and violence		
Exposure to incivility and rudeness		
Vandalism, bullying, and insults from superiors or colleagues		
Gradual physical and emotional separation from others		

Table 5 Categories and sub-categories of the theme of life and death experience

Theme	Category	Sub-category
Life and death experience	Hopelessness about life and the future	A vague or very negative imagination of the future
		Lack of a plan for life, after pandemic
		Low motivation to continue living/Loss of interest in life
	Witnessing unexpected death	Review of traumatic events
		Shock over patient death
		Denial of colleague's death
		Review of distressing thoughts
		Unresolved grief
		Past traumatic event
		Sudden death of loved ones

Table 6 Categories and sub-categories of the theme of seeking support

Theme	Category	Sub-category
Seeking support	Social support	Improve interpersonal communication
		Family support
		Colleagues and supervisors' support
		Media support
	Psychological support	Support from the community and those around
		Reducing the stigma associated with the disease
		Rehabilitation after the crisis
	Organizational support	Coping skill in difficulties and distress
		Constant monitoring and screening on HCWs
		Workplace risk assessment
		Conducting regular training courses
		Taking short breaks during work
		Appreciation for the HCWs' efforts
		Conducting psychotherapy for HCWs
		Teaching psychosomatic techniques to HCWs
		Group meeting to discuss stressful events and situations
Increasing salaries and reducing economic problems		

Table 7 Categories and sub-categories of the theme of self-care

Theme	Category	Sub-category	
Self-care	Health responsibility	Increasing health literacy	
		Self-care in not getting sick	
		Taking care of the family in the absence of illness	
	Maintaining a healthy lifestyle	Active participation in health decision-making	
		Avoiding high-risk behaviors of disease	
		Trying to keep the body strong	
		Regular periodic tests	
		Allocating time for sports and entertainment for HCWs	
	Building resilience against PTSD	Adaptations to stressors	
		Adjusting motivations	
		Adapting to new conditions	
		Regulating emotions	
			Having self-control
			Increasing spiritual attachment
			Post-traumatic growth

depression and anxiety, diminished life satisfaction, intrusive thoughts and memories, uncontrollable rumination on negative events, a loss of daily structure, and a pervasive fear of both strangers and close relatives—all indicative of post-traumatic stress responses.

Nearly all participants emphasized persistent fears related to infection and contagion, which also contributed to reduced motivation to seek medical care. One participant reflected on the long-term psychological burden of these fears:

“I still have a sick mentality. Even now, if I need to go to a bank teller, I must wear gloves. I keep thinking that if I don’t, I’ll get COVID-19.” (Participant 14)

Another participant described persistent compulsive behaviors and ongoing anxiety related to contamination:

“I still wash all my belongings. I remember we used to wash every product we bought. This stressful environment and atmosphere have stayed with me. I still think that if I don’t do this, either I or my family will get sick.” (Participant 7)

Participants experiencing this disorder commonly reported decreased self-confidence, low self-esteem, self-dissatisfaction, hopelessness about the future, and difficulty making decisions. One participant expressed the impact on their agency and family relationships:

“Now someone else is making decisions for me... I don’t have the willpower to decide... I just can’t... Even my family—my children and my wife—are

upset with me. They say I don’t do anything of my own free will.” (Participant 19)

Another participant shared profound feelings of self-rejection and worthlessness:

“I am not happy with myself at all... I hate myself. I can’t accept who I am... I feel worthless compared to others. When I saw the death of my loved ones with my own eyes and couldn’t do anything, I wondered what the point of my life was... Life has no meaning.” (Participant 23)

Feelings of helplessness in coping were also frequently expressed, with some participants highlighting the stigma around mental illness:

“It’s hard for me even to talk about this problem. I don’t want others to think badly of me. Sometimes, I feel like I can’t cope with anything.” (Participant 20).

Another concept from helplessness is mental distress. Some participants mentioned mental fatigue:

“There was a TV show that everyone who gets COVID-19 will die. Many people died too. Well, I was afraid of death. But this fear keeps repeating in my mind.” (Participant 16)

Another participant stated:

“When a person is dealing with COVID-19 patients, he should have enough rest at home so that he doesn’t even get sick, but we didn’t have it. It’s like this fatigue is still in my mind” (Participant 6)

Another one said that:

“I don’t go to parties much anymore. My social relations are limited to my family and my spouse. I say that I should not be sick, I don’t know about it and pass it on to someone.” (Participant 1)

Some participants mentioned the constant feeling of stress after COVID-19:

“Now, even though the corona virus is over, I still go somewhere, I have to use paper towels and disposable gloves to grab the handle of the car, open the door in the yard. I put disinfectant in places that I am not sure about, even outside the house. I use it and then I back home... I’m all stressed. I even passed this on to my child. I say when you’re going to Snap, don’t touch the car handle. Why, because

I think there might be something that wants to be transferred to us” (Participant 13)

Another participant says:

“It feels like a heavy burden is on my shoulders and I think my stress will never end or that there won’t be much change in my daily life.” (Participant 23).

Feelings of guilt

The concept of guilt emerged as a complex and significant factor contributing to feelings of helplessness and PTSD among participants. Several individuals specifically mentioned guilt related to infecting family members, lack of knowledge, perceived wasting of time, and failing to save patients. Some participants directly linked their PTSD experiences to the fear and guilt of potentially transmitting COVID-19 to others, particularly family members. One participant explained:

“In the department where I worked, we didn’t have any confirmed COVID-19 patients, but there was always the possibility that an infected patient could come from outside without us knowing. We were in close contact with patients as well. The COVID-19 department had clear duties, but we were constantly stressed about getting infected...” (Participant 2)

Many participants also expressed profound guilt over perceived wasted time and the inability to save patients. One participant described this feeling poignantly:

“It is very painful not to be able to save a dying patient... The nightmare of watching someone die in front of your eyes cannot be easily forgotten...” (Participant 23)

Job related consequences

Job-related consequences emerged unexpectedly as a significant issue. Due to the enormous work pressure and stress caused by the COVID-19 pandemic, many participants experienced job changes, burnout, declining job satisfaction, financial difficulties, loss of income or employment, work–life imbalance, overwhelming workloads, reduced work quality, limitations or inability to perform tasks, disability, and even early retirement. One healthcare worker described her job-related challenges, including feelings of hopelessness, overwhelming workload, and diminished work performance, as follows:

“Over the past two years, I have decided to change my job many times. I feel burned out... I am not satisfied with my job... I faced many problems during the COVID-19 period. My work-life balance was dis-

rupted, and the huge workload reduced the quality of my work. Even after a few years, I still feel negative about my job... I have lost my peace of mind. The best decision might be to change jobs or, ultimately, to retire early.” (Participant 18)

(Participant 18)

Social consequences

Another significant category that emerged from the interviews was the social implications experienced by participants, which contributed to feelings of frustration, hopelessness, and symptoms consistent with post-traumatic stress disorder. This category encompassed several subthemes, including impaired interpersonal relationships with patients, social stigma and rejection by patients’ families, taunting and humiliation directed at healthcare workers by patients’ relatives, severed connections between patients’ families and their social circles, reduced social interactions with friends and acquaintances, diminished intimate relationships with family members, and experiences of social exclusion, loneliness, seclusion, and feelings of worthlessness.

Many healthcare workers reported that working in COVID-19 wards noticeably led to social rejection and reduced participation in social activities. Most confirmed that the quality and frequency of their social communication declined significantly due to their work environment. One participant reflected on this impact, stating:

“I had to stay in touch with my parents only through my cell phone so they wouldn’t get infected with COVID-19. Although technology allowed me to talk to them via video calls and even see them, nothing compares to being with my parents and loved ones in person.” (Participant 21)

The COVID-19 pandemic posed an important challenge for interpersonal relationships across people. Lockdown restrictions and social distancing measures introduced alternative social norms that often exacerbated negative social effects. In our study, we observed that social relationships were broadly disrupted during the outbreak. Psychological stress and quarantine had varied effects depending on the type of relationship and the individual healthcare workers’ experiences. One participant elaborated:

“One of the major challenges many of us [healthcare workers] faced was the disruption of relationships with patients and their families. Due to the many difficulties during the COVID-19 era, reduced staff tolerance, and the overwhelming workload, we encountered negative behaviors from patients’ fami-

lies, such as social stigma and rejection, sarcasm and humiliation, and disconnection of their social networks.” (Participant 24)

Several participants also reported changes in their own families’ behavior following their work in COVID-19 wards or after contracting the virus. These changes were perceived negatively. For example, one participant shared: “I contracted this disease at work and then my wife contracted it from me. Because of this, my wife would blame me and wouldn’t even talk to me... The feeling of rejection is very bad... especially from those around and close to me.” (Participant 19)

Similarly, another person claimed:

“I used to have many friends and we often went out after work to relax. But after working in the isolation ward and coming into contact with COVID-19 patients—and after I got sick—none of them wanted to be around me. They feared I might spread the disease to them or their families.” (Participant 22)

Several healthcare workers also reported that their families’ social relationships were negatively affected, experiencing pressure and stress from neighbors, relatives, and the broader community. For example, one participant recounted:

“Although my family members were tested for COVID-19 and stayed home if positive, my mother said that when neighbors saw them, they would turn their heads and look away, even avoiding saying hello... They behaved as if they didn’t see them at all.” (Participant 18)

Another participant shared a similar experience concerning their child:

“I have a child who was in elementary school during the COVID-19 pandemic. Sometimes he would go out to play with neighborhood kids, but after the outbreak, the neighbors didn’t want their children to play with mine because they believed that working in a hospital environment would spread the disease to them.” (Participant 23)

Lack of support

Many participants described a profound lack of support during the COVID-19 crisis, which contributed significantly to feelings of helplessness and the development of PTSD symptoms. This lack included shortages in professional requirements, personal protective equipment (PPE), financial resources, human resources, and inadequate preparation for future epidemics. Several

participants believed that insufficient access to essential medical equipment—such as masks, gloves, and ventilators—directly intensified their sense of helplessness and worsened PTSD symptoms, making it even more challenging to cope with the crisis. One participant reflected:

“The allocation and distribution of personal protective equipment among colleagues were so inadequate that many of us did not receive enough... The severe shortage of protective equipment caused us immense stress... At every moment, we feared we might get infected.” (Participant 19)

Participants also pointed to shortages in medicine and basic equipment, recognizing that these deficits likely increased mortality rates and deepened feelings of despair among healthcare workers, who were powerless to save critically ill patients. As one participant explained:

“Unsuccessful treatments created a sense of hopelessness. It was deeply disappointing to see the death toll rising every day... There was nothing we, the staff, could do.” (Participant 12)

Some participants attributed their PTSD experience to the presence of an underlying illness in loved ones:

“I live with my diabetic mother. From that time, I always said that I should not get a virus from the hospital and take it home and cause her death. I still have this feeling with myself. I think this stress is in those who have sick parents.” (Participant 11)

Many participants mentioned working in a hospital with low financial and human resources:

“There was no medicine... there was no mask... there was no equipment... we worked like this” (Participant 18)

Other participants stated:

“At least we expected that the mask they give would be a quality mask” (Participant 4)

“We don’t have many protective equipment right now, let alone at that time. A part like this should be a full package of gloves, but isn’t it. It’s not latex gloves. There’s not enough mask. Not enough gun.” (Participant 9)

Some participants attributed the inadequate or lack of preparation to deal with the next pandemic as a factor for post-COVID-19 PTSD:

“The crisis warehouse, whether it’s a university or a hospital, should be equipped... lest a pandemic happens again, and then they say we don’t even have masks.” (Participant 6)

Another respondent stated that:

“Now we have a shortage of power... we have a shortage of equipment... there is no hope if it becomes a pandemic again” (Participant 11)

Theme 2: poor risk management

The second theme that emerged from the analysis of the interviews was poor risk management. that consisted of four categories: inadequate vocational skills training, poor anger management, low sense of security, and hazardous work environments (Table 4).

Inadequate vocational skills training

Many participants highlighted significant weaknesses in vocational skills training, which they identified as contributing factors to the emergence of PTSD related to COVID-19. Specifically, they reported insufficient training on coronavirus-specific topics, inadequate protocols for caring for COVID-19 patients, limited knowledge about the virus itself, poor communication skills with patients, and a general lack of practical and scientific education. One participant reflected on this gap:

“One of our biggest stresses during COVID-19, especially in the early months of the outbreak, was the lack of professional skills training on the use of personal protective equipment... The shortage of human resources was a huge challenge we all faced... I still remember the nightmare of not being prepared to handle the disease, which unfortunately continues to affect us.” (Participant 15)

Poor anger management

Another challenge that almost all participants agreed on was poor anger management. Participants cited factors such as inability to control the situation, inability to manage patients’ panic, immediate emotional reaction. One of the participants said:

“The worst experience I remember is when a pregnant mother died of COVID-19 in my ward... Her husband’s reaction was very harsh... The aggressive behavior combined with harsh reactions and swearing at the medical staff was very bad... Unfortunately, during the Corona period, emotional and impulsive behaviors from patients and even their companions have created a lot of psychological stress for the medical staff.” (Participant 21)

Low sense of security

Another prominent category expressed by most participants was a pervasive low sense of safety. They attributed this feeling to multiple factors, including the necessity to limit close contact with infected or suspected patients, concerns about social stigma, exposure to aggressive behavior from patients and their companions, anxiety about transmitting the virus to loved ones, uncertainty surrounding mandatory social isolation, and distress triggered by rising death statistics. One healthcare worker reflected:

“During the early months of the coronavirus outbreak, there was a strong sense of insecurity among us [healthcare workers] due to high fear and stress. The extreme fear of close contact with infected or suspected patients sometimes led to aggressive behavior from the patient and his companions.” (Participant 17)

Another participant added:

“Most of our concern was the feeling of insecurity about infecting our family members. This led to forced social isolation, and we only had contact with our parents by phone...” (Participant 24)

Hazardous work environments

Another concept that most participants agreed on was the harmful nature of the work environment. any described frequent exposure to physical violence and verbal aggression from patients and their companions, alongside bullying and insulting behavior from supervisors or colleagues. They highlighted that caring for patients amid such crises often led to gradual physical and emotional distancing from others, particularly within the workplace community. One participant noted:

“The working environment of hospital staff, especially during outbreaks of infectious diseases and especially pandemics, is very tense and dangerous... both physically and psychologically. When we are unable to provide timely and appropriate care to patients due to structural problems and lack of equipment, we are exposed to physical attacks/violence and even aggressive behavior from patients and their companions... Sometimes even supervisors hold us [nurses] responsible for these shortcomings and blame us. Working during outbreaks of infectious diseases in hospitals and clinics has many negative consequences, including distance between us and our superiors or even close colleagues...” (Participant 19)

Several healthcare workers reported that traumatic experiences such as bullying, harassment, and assault were frequent occupational hazards during the pandemic. Many accepted the suffering and death of patients as inherent to their roles, yet physical attacks and verbal abuse represented additional challenges within this stressful context. This involved caring for a never-ending assault of “patient after patient, unfortunately, gets sicker and sicker.” and the important task of balancing truths with confidence, as reported by one HCW:

“It’s not easy to look into the eyes of a sick, terrified, and scared person and talk about intubation, while you see... Most likely, this may be the last time they are awake and their eyes are open, and this may be the last video-call with their loved ones... It’s very difficult to recall these bitter and painful memories...” (Participant 24)

Theme 3: the experience of life and death

One of the elicited themes in the current study was the concept of life and death experience, including two different categories, namely hopelessness about life and the future, and witnessing unexpected deaths (Table 5).

Hopelessness about life and the future

During the interviews, many participants described a pervasive sense of despair linked to a bleak or uncertain vision of the future. They spoke of a lack of life planning post-pandemic, diminished motivation to continue living, a loss of interest in daily activities, and the persistent re-experiencing of traumatic events as key factors contributing to this psychological state. One participant recalled:

“It was very painful to see someone struggling to breathe and stay alive... I don’t think I’ll be able to forget these bad and negative scenes as long as I live. When I’m resting at home or even at a party, all these scenes would remind me... It would make me feel bad about myself and my job that I couldn’t save a human life.” (Participant 19)

This ongoing preoccupation with loss and dying, combined with the perceived futility of care efforts in the face of overwhelming patient deterioration, deeply affected the morale of healthcare workers (HCWs). Witnessing few recoveries among critically ill patients, many felt robbed of hope and became emotionally disengaged. While HCWs attempted to deliver patient-centered and family-centered care under difficult conditions—and their efforts were often appreciated—they also frequently encountered hostile interactions. One HCW stated:

“I am tired and frustrated, patients [as well] and their families are taking out their frustration and anger on the medical staff, and even though we are doing our best to protect them, they are yelling at us and treating us very harshly... as if we are to blame for their deaths... This is the worst part of our job... ignoring our efforts... It seemed as if people were not taking responsibility for their own health and that of those around them, and that only healthcare workers were responsible and to blame for everything that happened. This is not fair at all.” (Participant 21)

Witnessing unexpected deaths

Many participants described the negative effects of witnessing the unexpected deaths of patients, colleagues, and even family members during COVID-19 as a major shock. They said that the shock of the patient’s death and the denial of the colleague’s death, along with the disturbing thoughts of the COVID-19 era, disrupted the order and rhythm of their lives and work. A participant said:

“The sudden death of loved ones was a great sadness... I still can’t believe the death of my friend and colleague. Months after the end of the pandemic, I still review the bad memories of the Corona period every day... I don’t know if I was to blame? Or if I had done something wrong?... This issue is still unresolved for me.” (Participant 15)

Almost all participants mentioned issues like the death of patients hospitalized in the section:

“I will never forget a young girl with long black hair, an engineer, 20–21 years old, came to us and died within a week... I still remember her face.” (Participant 3).

Some participants attributed their post-COVID-19 PTSD experience to some past traumatic event:

“We have a lot of deaths in our section. Maybe my current stress is not only because of COVID-19. Something is already in my being and it is added on top of it. COVID-19 has only aggravated it” (Participant 6)

Some participants mentioned the death of colleagues:

“I lost one of my colleagues and it was very painful for me. My colleague was hospitalized with a low percentage but died. It was a collaboration that we were in the same ward, then she went to the Corona ward for help. She was only 45 years old and died... I have a very bad memory of her death.” (Participant 2)

Providing care for patients dying from COVID-19 under highly restrictive visitation rules—where staff assisted companions in saying their final goodbyes and witnessing their loved one's passing—was described by several participants as an extremely traumatic experience. One staff member recounted the emotional impact of this process:

“When patients died in the COVID-19 intensive care unit, relatives were not permitted in... We had to organize a meeting for relatives to see the death of their loved ones... It was very hurtful and traumatic... Imagine being a mother having to see the death of her kid? Or a child seeing the death of their mam or dad?... The morale and mental health of many HCWs working in this pandemic was devastated” (participant 19)

These traumatic experiences were compounded by the deep despair and disconnection of some members of the community who rejected to track public health procedures.

Theme 4: seeking support

Participants highlighted many supportive factors that may contribute to reducing the negative effects of the pandemic in HCWs. These factors included social support, psychological support, and organizational support (Table 6).

Social support

Participants emphasized the crucial role of social support in alleviating symptoms of post-traumatic stress disorder (PTSD). Several described diverse challenges related to accessing or receiving such support. Many believed that deliberate efforts to provide social support—particularly in the workplace—could mitigate PTSD symptoms among healthcare workers (HCWs) affected by the COVID-19 pandemic. Forms of support mentioned included improved interpersonal communication, emotional and practical support from family members, assistance from colleagues and supervisors, positive media messaging, and encouragement from the broader community.

Participants reported a wide range of experiences and expectations regarding support. Some stated that they received no assistance from departmental managers or supervisors, while others indicated that they had access to adequate support. However, even when support was available, not all participants chose to engage with it. As one participant explained:

“...I never received any supportive behavior in the COVID-19 sector, and in [my main workplace... the ICU sector] I scarcely received any proper support.

Always stress and a commanding behavior from the supervisor with no emotion... and nothing... absolutely nothing, in the COVID-19 [sector].” (Participant 22)

Another one highlighted that:

“We didn't get any support. Not even recognition and thanks. National encouragement. Provincial example. Promotion. We didn't get any support from anywhere...” (Participant 1)

Other one said that:

“Nurses should be supported. The expression of the nurses of the Corona ward should be introduced as a model nurse. That's all we want” (Participant 7)

Frustration regarding the lack of support was both tangible and widespread, as many participants reported that supervisors and department heads failed to respond adequately to even the most basic needs related to personnel well-being and mental health. In contrast, two participants recalled being offered meaningful sources of support, though they were ultimately unable or unwilling to utilize them at the time:

“...The department managers arranged our shifts appropriately. They even offered us shorter night shifts if we weren't feeling well... But I didn't accept it—it was my decision. I couldn't bear the idea of someone else taking on my workload while I rested.” (Participant 20)

“...There were acceptable forms of support available, but only during the first wave of the pandemic—when I really needed it. Still, I wasn't receptive to it. It wasn't the right time... My colleagues were dying in front of my eyes... The memory of those days remains painful—a recurring nightmare.” (Participant 18)

These participants explained that although emotional and occupational support had been offered, it was delivered at a time or in a manner that made it difficult to accept. They expressed a sense of internal conflict—despite desperately needing support (“when I indeed wanted it”), they did not perceive it as a viable or appropriate option in that moment. Moreover, some questioned whether accepting the support would have made any significant difference, particularly in the absence of a strong sense of moral justification or obligation (“I was not receptive to that support”).

Additionally, several participants stressed the importance of receiving support from family members. As one participant noted:

“My Scopus is a nurse. He doesn’t have these conditions at all, and he constantly complains to me that why do you do these things... I want my family to at least support me.” (Participant 12)

Another participant stated:

“Like a martyr who passed away at that time and his family is still respected everywhere like on TV. The staff who was in the Corona section for two years, now there should be some respect and support on TV.” (Participant 6)

Several participants highlighted the influential role of the media in shaping public attitudes toward healthcare workers. They noted that media coverage, particularly stories emphasizing the dedication and selflessness of medical staff—especially nurses—contributed to a shift in public perception. According to participants, this portrayal led to a more positive and appreciative view of nurses among the general population. As one participant remarked:

“Now only the press talks about COVID... People are aware, they are not afraid of us anymore... they often call us and ask questions.” (Participant 20)

As a result, in order to overcome the aforementioned challenges, the managers and supervisors should provide support stability and create situations pertaining to respond positively to the minimal needs of personnel about HCWs well-being and mental health that would help grow this group.

Psychological support

One of the key themes emphasized by most participants was the importance of psychological support. The availability and effectiveness of psychological support in mitigating PTSD symptoms among healthcare workers (HCWs) during the COVID-19 pandemic appeared to vary significantly depending on the management structure of each hospital and clinic. Participants identified several relevant components, including post-crisis rehabilitation and the development of coping skills in times of stress and adversity.

Several participants also underscored the need to reduce the stigma associated with COVID-19 as part of enhancing coping strategies. In the absence of formal or adequate support mechanisms, some HCWs turned to their coworkers—who had already proven to be a source

of informal support prior to the pandemic. One participant described how staff initiated peer-support practices, such as informal debriefings, to help process their experiences and relieve emotional distress:

“But we supported each other to some extent – we did this – after each shift, we would sit in the office or at the nurses’ station for about 30 to 45 minutes and talk to our colleagues a little, so that if we had a really tough day... for example, there were a lot of critically ill patients or even a lot of deaths, we would discuss it and talk about it to resolve the excitement and stress of the work and the bitter events of that day at work and avoid bringing it home and talking to the family... I think it was a fairly appropriate approach at that time to reduce the psychological burden...” (Participant 19)

As described by most participants, sudden or highly traumatic events required psychological processing and reflection. Enduring such experiences often meant carrying an emotional burden that exceeded what an individual could reasonably bear. Suppressing or “ignoring” these experiences was, in itself, experienced as an added strain—one that could have long-term detrimental effects on healthcare workers’ mental and physical health.

Beyond caring for patients, HCWs also felt responsible for supporting one another. While this mutual care was essential, it ultimately became overwhelming and, for some, emotionally unsustainable. The varied accounts of support that participants provided reflect the diversity of their needs, underscoring that a one-size-fits-all solution is neither practical nor effective.

A recurring theme in the narratives was the desire for acknowledgment and appreciation of their extraordinary efforts during the pandemic. Many participants expressed a need for structured recognition, proactive attention to staff concerns, and comprehensive rehabilitation following the crisis. These were seen as crucial elements not only for individual recovery but also for the long-term sustainability of the healthcare workforce.

“I expect to be seen now. Not just tell them what happened during the Corona era. Why don’t they come and ask me how I am now?” (Participant 13)

Another participant stated:

“We went through a pandemic. Do you agree? A crisis of this magnitude. Now we need them to care about us. Now we need to tell them what to do to make you feel better?” (Participant 16)

Conducting psychotherapy for HCWs mentioned by some of them:

“When I was on the front lines of the COVID-19 response and then developed symptoms of post-traumatic stress disorder, I realized how helpful psychological treatments can be. The most important treatments for this disorder are psychotherapies that focus directly on the experience of trauma, such as trauma-focused cognitive behavioral therapy. It would be better if they set up these psychotherapy sessions for us.” (Participant 19).

Some participants spoke about the importance of teaching psychosomatic techniques to HCWs:

“We had heard a lot about relaxation and things like that, but even though we are from the health system, we were never taught how to do it properly. When it is easy to reduce some of the stress with psychosomatic techniques, why shouldn't we be educated?” (Participant 19)

Organizational support

Participants emphasized the critical role of organizational support—particularly from hospitals, clinics, and the Iranian Ministry of Health—in addressing the needs of healthcare workers (HCWs) during the pandemic. They identified several key areas of institutional responsibility, including regular screening of HCWs, the provision of ongoing training programs, scheduled work breaks, salary increases, and the alleviation of economic stressors.

Several participants specifically highlighted the importance of frequent health screening by the organization. As one participant explained:

“The symptoms of this disorder may appear gradually, and sometimes the person himself does not realize the severity of the problem or, for various reasons, does not have enough motivation and time to pursue treatment. For this reason, frequent and regular screening by health care organizations is very important.” (Participant 20)

In the organizational support category, some participants followed regular training courses:

“I think that organizations that offer various training courses should also offer a few regular training courses on coronavirus or any other pandemic, stress management, etc. This way, we will have fewer problems and also feel more empowered.” (Participant 22)

Some participants mentioned Taking short breaks during work can support them:

“During the Corona period, the constant work pressure and stress made me feel like I was suffocating. Our work pressure still hasn't decreased. Stress is also with us. Taking short breaks during the work shift can be like a breath of fresh air.” (Participant 19)

Almost all participants agreed on the necessity of providing financial and welfare support for employees working in departments that regularly interact with infected patients. Several healthcare workers specifically mentioned the importance of salary adjustments, as well as the provision of bonuses and other financial incentives, to acknowledge the increased risks and burdens associated with their roles. *“They should motivate us from the organization itself. Why don't they consider incentives, for example, saying it's just for the efforts at that time?... They should increase our salaries by at least 20%... We risked our lives...” (Participant 5)*

Others also mentioned considering additional welfare facilities. Some participants believed that managers and supervisors could have created better conditions for employees by properly planning. In this regard, another participant stated that:

“They should have given us the right to assemble more freely. We should stay at home for at least two days. Like Zare Hospital (name of another hospital) which has closing hours. Mandatory closing hours.” (Participant 9)

In relation to reducing the economic problems of personnel, a participant stated that:

“The income of the personnel who were in contact with Corona was no different from other departments. At least we would get a financial incentive, which would reduce our problems.” (Participant 4)

Theme 5: Self-care

Participants highlighted many self-care factors that contribute to control of PTSD resulting COVID-19 in HCWs. These factors included health responsibility, healthy lifestyle, and resilience against PTSD (Table 7).

Health responsibility

Several participants emphasized the crucial role of the health responsibility in supporting and caring this group by increasing health literacy, self-care in not getting sick, taking care of the family in the absence of illness, and

active participation in health decision-making. As stated by one of the participants:

"I'm reading everything. I'm reading articles about this disease. About ways to prevent it... Not even just this disease. Every disease that comes, I quickly go to read it so that it is not transferable, or if it is transferable, how are you? We have to stop it." (Participant 1)

Some participants mentioned taking care of themselves in not getting sick:

"Sickness during the Corona period was good. We used to go on sick leave for two weeks and we would be fine. Now if you get Corona, and they say it's not Corona, it's the flu, they don't give sick leave to anyone anymore. I have to come to work under these conditions. Well, I don't want to get sick to come to work under these conditions." (Participant 2)

Taking care of the family from getting sick was also mentioned by some participants:

"We were under pressure in the hospital, we went home..., and we pressured our children to be careful when you go out... I reminded them of all the ways to take care of themselves." (Participant 4)

Some participants mentioned their active participation in health decision-making:

"One of the best things to do is to actively participate in every health-related activity, especially those that are related to us, and not just be recipients of services." (Participant 19)

A participant said:

"Our participation in health decisions is very important. When I can be a partner in these decisions, I feel more motivated. I feel more in control. Even if I have a problem, I find it easier to seek treatment." (Participant 21)

Healthy lifestyle

Several participants emphasized the importance of maintaining a healthy lifestyle, highlighting various aspects such as avoiding high-risk behaviors for disease transmission, efforts to strengthen the body, undergoing regular medical check-ups, and allocating time for physical activity and leisure. One interviewee shared the following perspective. Within this category, nearly all participants stressed the need to avoid high-risk behaviors.

"Omicron peak I got Corona. I didn't get corona at the first 4 peak. Then here I didn't observation it very much. I mean, I had put on a simple mask, then now it's in my mind that if I don't observation of it, I'll get infected again. For I have to comply with everything." (Participant 8)

Other contributors mentioned:

"Using personal protective equipment was very important to me, it still is. I must wear gloves and a mask." (Participant 10)

"Until a year ago, I used to wear a hat so as not to touch my hair, now I may not wear a hat, but I still take care of the rest." (Participant 14)

"I still wear this mask even though no one wears a mask in the hospital. Next time, I will pay for these masks from my own pocket." (Participant 5)

Efforts to keep the body strong and regular periodical tests were mentioned by some participants:

"I have to wash my hands all the time. I drink liquids all the time... Or even all kinds of teas. This way I feel that I keep my body strong to fight the virus." (Participant 3)

Or another contributor admitted that:

"I now take regular tests. Maybe before this disease was not so important to me, but now tests and my body's health are important to me." (Participant 8)

Allocating time for sports and entertainment for HCWs mentioned by some HCWs:

"Many activities, such as exercising or yoga, or some entertainment such as art, can reduce work pressure or emotional stress." (Participant 22)

Resilience against PTSD

One of the main strategies that most participants recommended for self-care to mitigate the effects of PTSD was the use of resilience-enhancing techniques. Participants identified various approaches to fostering resilience in the context of PTSD, emphasizing that the choice of method often depends on the duration and severity of the symptoms. These strategies included adapting to stressors, adjusting personal motivations, adapting to new circumstances, regulating emotions, practicing self-control, fostering spiritual connections, and promoting post-traumatic growth.

“This job requires a resilient personality. Sometimes the tension with the supervisor or the patient and their companions was very annoying, [especially during the tense times of Corona] ... The worry about being a carrier of the disease was always overwhelming... We endured a lot of stress and tension during work, sometimes it was beyond our tolerance. I became desperate and disappointed when I saw the pain, suffering and death of patients. Sometimes the poor physical condition of critically ill patients made me even more incapacitated. Some colleagues were not aware of their capabilities... Tolerance and resilience must be increased in this job and in relation to critically ill patients.” (Participant 18)

One of the participants emphasized the role and importance of the approach of adapting to stressors as well as adapting to new conditions.

“The mental stress and strain during the COVID-19 outbreak, especially in waves 3 and 4, was very high. Now that I think about it, if we had been able to adapt quickly to the stressful and new conditions, perhaps we wouldn’t have had so many mental problems after Corona.” (Participant 11)

Participants emphasized that planning by management departments and policymakers in mental health—particularly during epidemics—is both necessary and a priority. They recommended holding workshops and training seminars aimed at preparing mental health caregivers, with topics such as stress management, resilience building, and related skills. Consequently, providing psychological resilience interventions for front-line healthcare workers (HCWs) is considered one of the highest priorities during a pandemic.

Finally, the content analysis revealed that the experience of post-traumatic stress disorder (PTSD) among health system employees encompasses multiple interconnected dimensions: helplessness stemming from physical consequences, psychological reactions including guilt, job-related implications, social consequences, lack of support, inadequate risk management due to weaknesses in vocational skills training, poor anger management, a low sense of security, and the harmful nature of the workplace environment. Additionally, it includes experiences related to life and death—such as disappointment with life and the future, as well as witnessing unexpected deaths. Participants also highlighted the importance of seeking support—social, psychological, and organizational—and underscored that effective self-care depends on taking responsibility for one’s health, maintaining a healthy lifestyle, and fostering resilience against PTSD.

Figure 1 presents a schematic overview of healthcare workers’ perceptions and experiences of PTSD caused by COVID-19.

Discussion

Overview

This study aimed to investigate healthcare workers’ (HCWs) perceptions and experiences of post-traumatic stress disorder (PTSD) two years after the most recent global pandemic. To our knowledge, this is the first qualitative study conducted in Iran exploring HCWs’ perceptions and experiences of PTSD in this post-pandemic period. Most previous studies on this topic have been either cross-sectional, retrospective, or focused on PTSD during the COVID-19 pandemic itself. In contrast, the present study offers a qualitative exploration of PTSD perceptions and experiences among healthcare system employees after the pandemic.

The findings identified several core concepts and strategies, including helplessness, inadequate risk management, experiences related to life and death, seeking support, and self-care. To uncover HCWs’ perceptions and experiences of PTSD resulting from the COVID-19 pandemic—and to identify practical strategies to alleviate PTSD symptoms—the study explored theoretical frameworks and analyzed field data through thematic analysis, identifying themes, categories, sub-categories, and codes. These insights can inform policymakers in making strategic decisions and developing effective approaches for future epidemics.

Given the vital role HCWs play in caring for and treating patients during pandemics such as COVID-19, it is crucial to understand their perceptions and experiences of PTSD post-pandemic, as well as the long-term impacts on their mental health and potential strategies to support their well-being.

Theme 1: helplessness

We observed that helplessness is a key component of PTSD, encompassing six categories: physical consequences, psychological reactions, feelings of guilt, job-related implications, social consequences, and lack of support. The sense of hopelessness among healthcare workers (HCWs) can be further exacerbated by restrictive measures and policies implemented during the pandemic, which limited or entirely prevented engagement in socio-recreational activities known to benefit physical and mental health. Overall, the persistent hopelessness—driven by heavy workloads, social distancing restrictions, and heightened mortality rates—may significantly contribute to the severity of PTSD symptoms among HCWs.

The findings also highlighted that participants experienced varying degrees of psychological distress, including poor sleep quality, the heavy burden of hospitalized

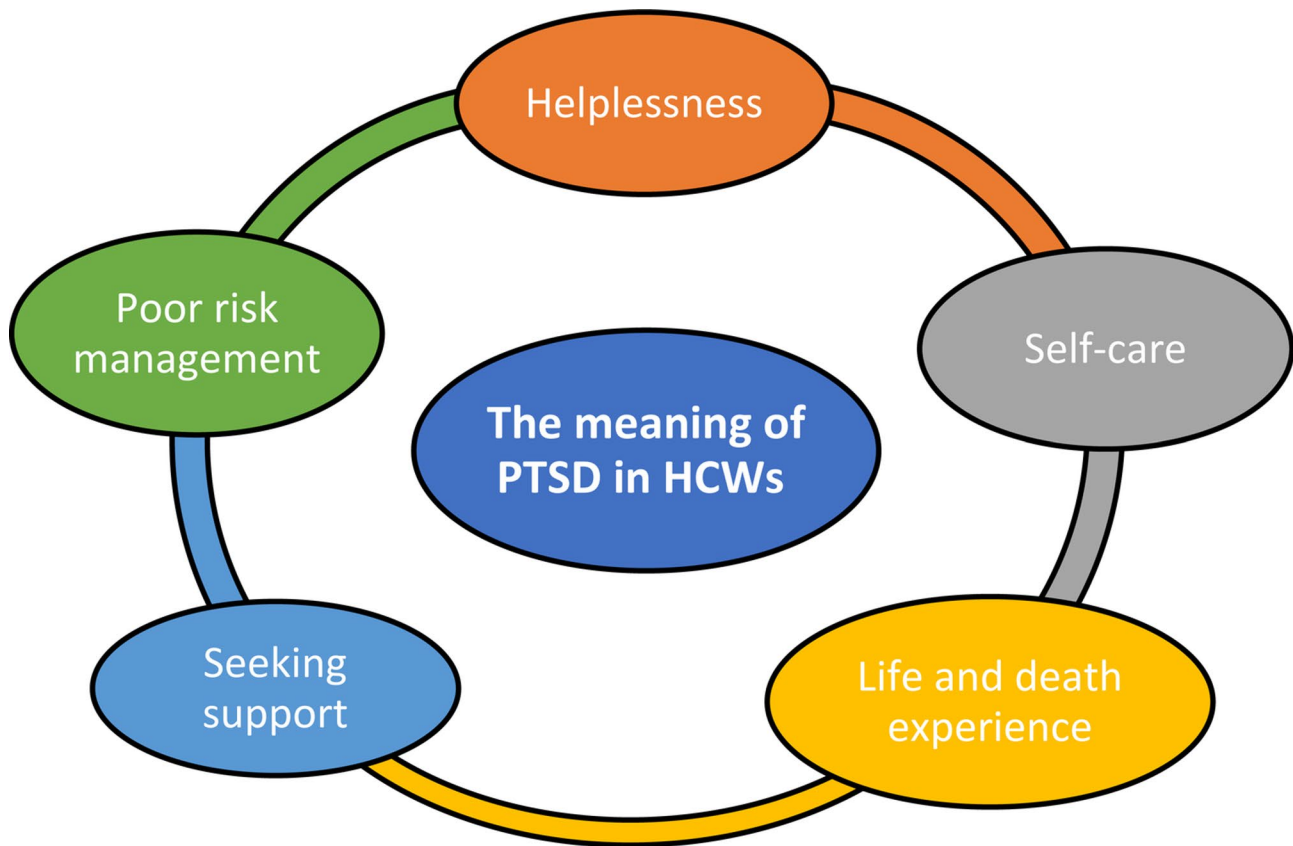


Fig. 1 Schematic view of perception and experience of HCWs of PTSD caused by COVID-19

patients, close contact with COVID-19 cases, and the emotional toll of past traumatic events, all of which contributed to feelings of helplessness in coping with the crisis. This psychological distress is associated with adverse occupational outcomes, such as reduced quality of patient care, increased irritability towards colleagues, cognitive impairments affecting clinical performance, and intentions to leave the profession [25, 26].

Physical consequences

In line with this study, other research has shown that physical consequences such as low sleep quality and nightmares are one of the predictors of PTSD during the COVID-19 era [5, 12, 27]. In fact, sleep disorders are observed at a high rate in groups at risk of trauma, which can contribute to the occurrence and maintenance of PTSD [28], highlighting the need to address this issue in healthcare workers. In addition, the high load of hospitalized patients and close contact with patients were other issues identified by HCWs. HCWs are at increased risk of infection and contracting COVID-19 [29], which can lead to mental disorders such as PTSD in them. Another study demonstrated that healthcare workers (HCWs) who reported high levels of psychological distress during the COVID-19 outbreak also experienced various

physical health issues, including sleep disturbances, headaches, and other somatic symptoms [34]. Participants commonly reported feelings of extreme fatigue, loss of appetite and energy, as well as lethargy and boredom. These findings highlight the critical need for both individual- and organizational-level interventions aimed at reducing fatigue, chronic stress, and burnout among HCWs responsible for patient care.

Psychological consequences

Almost all participants believed that psychological reactions were common consequences experienced by healthcare workers (HCWs) as a result of the COVID-19 pandemic. Many reported experiencing varying degrees of guilt and self-blame, persistent anxiety, fear of becoming ill, concerns about transmitting the virus to others—especially to spouses and children—obsessive-compulsive behaviors, lack of self-confidence, and even suicidal thoughts, all of which contributed to feelings of helplessness. Worrying about infection was identified as a key stressor for HCWs during the outbreak, given that the risk extended beyond their own health to the well-being of their families [30]. Feizipour et al. [31] found that employees with direct or indirect contact with COVID-19 patients experienced depression, aggression, anxiety,

psychosomatic symptoms, poor sleep quality, obsessive behaviors, and suicidal ideation [31]. Similarly, a study by Bismark et al. [32] reported that one in ten Australian employees experienced suicidal thoughts or engaged in self-harm during the pandemic [32]. These outcomes were more prevalent among employees who had friends or family members infected with COVID-19 and among those living alone. Research on non-fatal suicidal behaviors during the pandemic has implicated psychiatric factors, emotional disturbances, depression, home and workplace stress, personality disorders, as well as various psychological, physical, and occupational stressors [33].

Feelings of guilt

In the present study, we found that feelings of guilt contributed to increased helplessness, manifesting in various forms such as guilt over potentially infecting family members, insufficient knowledge, perceived time wasted, and the inability to save patients. Aligned with the present study, a study of Georgieva [34] revealed that one of the strongest predictors of the occurrence of PTSD in the time of COVID-19 was the fear of contracting COVID-19 [34]. A review study also showed that HCW's fear of infection and transmission of the disease to family, friends and colleagues can lead to PTSD symptoms in them [10]. In a qualitative study, fear to infect family members, choosing work instead of family, inability to fulfill family roles were mentioned as challenges of HCW during COVID-19 era [35]. In line with this study, other studies mentioned the fear of contracting the disease, the fear of transmitting the disease to one's spouse, children, and others as important predictors of PTSD [36–39]. The authors found that while healthcare workers (HCWs) fulfilled their professional responsibilities, the dual role of being both HCWs and family members created internal conflict. Participants were primarily concerned about infecting family and friends whom they perceived as vulnerable. Other studies on emergency situations reported that HCWs were worried about anticipated overtime if colleagues were quarantined, as well as the stigma associated with the disease and the health risks to themselves and their families [40], reflecting a broader emotional distress [41–43]. Several articles have examined HCWs' knowledge, attitudes, and behaviors towards COVID-19 patients, highlighting that healthcare workers still harbor fear of the disease and sometimes discriminate against infected patients [44–46]. Contributing factors to these attitudes include fear of disease transmission, uncertainty about effective care, and a sense of futility in providing care to patients with potentially severe illness [47]. Therefore, it is essential to give greater attention to the detrimental impact of guilt and fear of contracting COVID-19 on the mental health of HCWs.

Job-related implications

In the present study, participants reported varying degrees of job-related consequences and challenges caused by COVID-19, which likely contributed to feelings of helplessness among healthcare workers (HCWs) and, consequently, to the development of post-traumatic stress disorder (PTSD) symptoms. Several participants expressed intentions to change jobs and reported experiencing burnout and job dissatisfaction. Moreover, our findings indicated that the high workload, particularly during the COVID-19 pandemic, led to a decline in work quality and service delivery, resulting in issues such as work-life imbalance and reduced capacity to perform work tasks effectively. Consistent with these findings, Alinejad et al. demonstrated a significant negative relationship between work-life balance and family functioning and burnout among nurses [48], suggesting that individuals who maintain an appropriate balance between professional and personal life are less prone to burnout. Similarly, Golparvar et al. reported that person-job fit is negatively associated with emotional and occupational exhaustion, and positively associated with job satisfaction and organizational commitment [49]. Thus, nurses who feel a strong connection and interest in their job or department are more likely to endure workplace hardships—such as high workload and stress—and are less susceptible to fatigue and burnout. It is crucial for individuals to consider their job fit and level of interest to mitigate burnout risks. Additionally, engaging in regular physical exercise and recreation emerged as effective strategies for coping with burnout related to COVID-19.

Social implications

Most participants noted that social implications—such as strained interpersonal relationships with patients, social stigma and rejection by patients' families, taunting and humiliation directed at their families, and reduced social interactions with relatives, friends, and acquaintances—led to feelings of loneliness, isolation, and worthlessness. These experiences ultimately resulted in social rejection and contributed to PTSD symptoms among healthcare workers (HCWs) during the COVID-19 pandemic. These findings highlight the urgent need for HCWs to be more aware of factors that endanger their health. The social implications, particularly stigma and discrimination identified in this study, are generally linked to a lack of public understanding about the disease transmission cycle. Therefore, effective public communication and education are essential—not only to encourage adherence to preventive measures but also to foster genuine respect and cooperation toward frontline HCWs.

Stigma remains an urgent problem for national health systems and has been recognized as a health crisis that HCWs must actively combat [50]. HCW stigmatization

is closely associated with both physical and psychological health outcomes; those who anticipated higher levels of stigma reported greater psychological distress and more pronounced somatic symptoms [51]. Several key domains assess social stigma in healthcare, including discrimination and the distress associated with fears of infection and its consequences [52–54]. When HCWs are unaware of stigmatizing attitudes and behaviors, the impact of stigma can be particularly severe. Identifying and addressing stigmatizing views and practices is critical, as stigma adversely affects individuals' self-concept [55, 56], professional quality of life, stress levels, engagement, burnout [57, 58], and life satisfaction [57, 58].

Lack of support

Another important component contributing to symptoms of helplessness associated with PTSD is the lack of adequate support, which includes deficiencies in professional resources, insufficient or unavailable personal protective equipment (PPE), limited financial resources, shortages of human resources, and inadequate preparedness to manage future epidemics. These factors were observed to play a significant role in the emergence of helplessness symptoms among healthcare workers (HCWs). Practical support—encompassing instrumental support, informational support, appraisal support, and social support—represents a crucial resource in efforts to assist the most vulnerable personnel during the COVID-19 pandemic. Although the pandemic altered the modalities of support delivery, collaboration with relevant managers and decision-makers was essential to secure professional support, funding, human resources, equipment, facilities, and other necessary forms of assistance. It has been demonstrated that working in a hospital with low human resources can negatively affect the physical and mental health of HCWs [59]. In fact, exposure to high working hours can lead to the occurrence of PTS in HCWs [60]. In a qualitative study conducted by Romate et al. [35], lack of resources was one of the work-related challenges mentioned by HCWs. Lack of human resources can be caused due to servant being infected with COVID-19, unwillingness to work during the epidemic and abdication [35]. At the same time, it is important to mention that maintaining an adequate healthcare workforce in the COVID-19 crisis requires not only a sufficient number of doctors, nurses, specialists, pharmacists, respiratory therapists and other HCWs, but also requires the ability of each person to take care of a high volume of patients [61]. In another qualitative study, it was found that increased workload, lack of protective equipment, or lack of standard operating procedures were linked to mental health problems and were identified as needs of frontline healthcare workers during the COVID-19 pandemic [62]. As a result of the reduction

of work shifts and the subsequent elimination of physical and mental fatigue of nurses, the recruitment of new auxiliary staff in the health medical system can lead to the reduction of PTSD in health system employees [8]. All these issues were mentioned by the participants of this study. These findings emphasize the important role of support and related factors in reducing the risk of helplessness, as well as physical and mental distress, among healthcare workers.

Theme 2: poor risk management

According to the findings, deficiencies in vocational skills training, inadequate anger management, a low sense of security, and the hazardous nature of the workplace contributed to the development of PTSD symptoms among healthcare workers in Iran during the COVID-19 crisis, largely due to poor risk management.

Weakness in vocational skills training

The findings in this category revealed that healthcare workers exhibited significant weaknesses in vocational skills training related to managing the COVID-19 crisis at various levels. These included insufficient training on the coronavirus itself, lack of clear procedures for caring for COVID-19 patients, limited knowledge about the virus, inadequate communication skills with patients, and a general absence of practical and scientific training. The lack of education and information about the virus was identified as a major weakness among medical HCWs in controlling the disease, which contributed to increased workload and the emergence of PTSD symptoms. During the early stages of the COVID-19 outbreak, little was known about the precise mechanisms through which the virus affected both physical and mental functioning. The sudden onset of a life-threatening illness placed extraordinary pressure on healthcare workers [4]. Several studies have shown that concerns regarding staff education about emerging disease trends are significant sources of stress among HCWs. One of the greatest challenges facing healthcare systems worldwide during epidemics is the lack of knowledge about the causes and progression of the disease [21, 47, 63, 64]. Therefore, careful planning to enhance HCWs' empowerment—through both material and moral support—alongside comprehensive training and provision of necessary information about the disease, increasing the availability of psychologists in hospitals, and equipping HCWs with appropriate crisis management skills can be highly effective in addressing these challenges.

Poor anger management

Most participants noted that poor anger management—including difficulty controlling situations, managing patients' panic, and reacting impulsively—contributed

to their inability to effectively manage the risks posed by the disease during the pandemic. These challenges led to heightened stress levels and increased symptoms of PTSD. Additionally, patients' violent reactions and confrontations, as well as aggressive and impulsive behavior from both patients and their companions, created significant psychological strain on medical staff. These findings align with previous studies [63, 65–67]. Consequently, it is crucial to plan and implement in-service training courses for healthcare workers aimed at enhancing resilience, anger management, and stress coping skills to better prepare them for future epidemics.

Low sense of security

The findings of a recent study revealed that the majority of participants experienced a strong sense of insecurity. They reported intense fear related to close contact with infected or suspected patients, which sometimes escalated into aggressive behavior by patients and their companions. These conditions heightened their concerns about potentially infecting family members, often resulting in forced social isolation and a reduction in social interactions, consistent with findings from other studies [68, 69]. Healthcare workers play a critical and demanding role as frontline responders in any epidemic. They protect lives while confronting numerous threats, including psychological and physical violence, long working hours, stigma, insomnia, concerns about their own health and that of their families, low energy, job-related burnout, lack of protective equipment, and PTSD [69]. Therefore, it is essential to ensure the security of healthcare workers not only to safeguard patients but also to guarantee the safety and well-being of the workers themselves [69, 70]. The increasing emphasis on occupational safety within healthcare systems has led to ongoing monitoring and improvements in safety practices for healthcare workers. Providing accessible, practical guidance on coping strategies and stress management within healthcare systems remains a critical and challenging task, yet it is vital for enhancing quality of life and work, and for preventing PTSD among healthcare workers.

The harmful nature of the workplace

Participants reported exposure to physical attacks and violence, rude behavior from patients, and occasionally even insulting conduct from superiors or colleagues, which caused them to gradually withdraw socially—a known precursor to the development of PTSD. Consistent with our findings, other studies have documented that healthcare workers (HCWs) are often subjected to violence from patients and their companions, resulting in elevated levels of PTSD symptoms [71, 72]. Furthermore, research indicates that senior HCWs tend to exhibit fewer symptoms of PTSD and burnout compared to

their junior counterparts [73]. This may be explained by the possibility that nurses experiencing persistent post-traumatic stress reactions tend to leave the profession earlier, while more resilient individuals remain. Multiple studies have highlighted that the ongoing demands of the COVID-19 pandemic continue to exert significant negative effects on the mental health of HCWs [63, 65, 67, 74, 75].

Given that workplace violence is a known predictor of PTSD symptoms, training HCWs in violence management has been shown to be effective. Specifically, there is evidence that training HCWs to anticipate, recognize, and respond appropriately to violent behavior—as well as establishing protocols for interacting with aggressive patients that eliminate unsupervised interventions—can prevent or mitigate PTSD symptoms of traumatic events [76]. Lee et al. found that nurses who participated in violence management courses experienced a reduced risk of developing PTSD symptoms after workplace violence incidents. They suggested that gradual, systematic training over several years offers HCWs repeated opportunities to refine violence management skills, thereby enhancing self-esteem and reducing the psychological impact [64]. Additionally, a cross-sectional study by Hamama-Raz et al. investigating the relationship between PTSD symptoms, age, and length of service found that stressful experiences such as workplace violence tend to recur in hospital environments [77]. Shi et al. further reported that among HCWs subjected to physical violence in hospital settings, PTSD symptom severity was inversely correlated with levels of objective social support and the effective utilization of support resources [78].

This suggests that cumulative exposure to violence may increase PTSD vulnerability over time, which could explain why older, more experienced HCWs often report higher PTSD symptoms than younger, less experienced colleagues.

Our findings align with growing evidence regarding the profound adverse mental health consequences of the COVID-19 pandemic on HCWs. We emphasize the severe distress experienced by many HCWs, manifesting as PTSD symptoms, depression, anxiety, and stress. Moreover, participants described the traumatic nature of their workplace environments, which contributed to feelings of disappointment, failure, and intentions to leave the profession and patient care roles.

Theme 3: life and death experiences

We observed that life and death experiences are a vital component of PTSD in HCWs. In addition, disappointment with life and the future and unexpected death witness contributed to increasing PTSD in HCWs.

Disappointment with life and the future

Under the category *disappointment with life and the future*, subcategories include a vague or highly negative perception of the future, lack of life planning post-pandemic, diminished motivation to continue living, loss of interest in life, and recurrent rumination on traumatic events. The critical nature of the COVID-19 pandemic—marked by threats to personal and colleagues' safety, a continuous rise in infections, increasing mortality, and the absence of effective treatments or vaccines—contributed significantly to the onset of mental health disorders such as PTSD among healthcare workers (HCWs) [8]. A qualitative study by Khezri et al. identified several PTSD-related experiences among nurses, including persistent recollection of traumatic events, denial of colleagues' deaths, absence of life plans, intrusive distressing thoughts, irritability, unresolved grief, frequent mental flashbacks of traumatic scenes, fear of receiving bad news, sudden loss of loved ones, and avoidance of intensive care units [79]. The present study similarly found that past traumatic experiences and pre-existing psychological disorders contributed to ongoing mental distress. This aligns with previous research indicating that prior psychiatric conditions are significant risk factors for PTSD during public health crises such as COVID-19, SARS, and MERS [54, 72]. Furthermore, social distancing measures exacerbated feelings of loneliness and disrupted grieving processes, particularly for HCWs who experienced the unexpected loss of family members or close colleagues due to COVID-19. Such experiences can fundamentally alter one's perception of the world as a safe and predictable place, and diminish trust in supervisors as sources of protection. HCWs may find themselves overwhelmed by grief and unable to adequately support the emotional needs of their own families. In these critical circumstances, the emotional distress of bereaved individuals may be easily overlooked. Organizational support—particularly from managers and supervisors—can play a vital role in helping HCWs navigate grief by fostering creative ways to honor the deceased, providing education on the grieving process, and cultivating a compassionate environment in which staff feel supported and encouraged to share their experience [80]. Given that psychological distress is defined as a state of emotional suffering caused by exposure to stressful events that threaten one's physical or mental health [67], it is essential that health systems prioritize the psychological well-being of HCWs.

Witnessing unexpected deaths

The findings of the present study indicate that participants reported experiences of witnessing the unexpected deaths of colleagues, patients, and even loved ones—events perceived as extremely stressful and strongly

associated with the emergence of PTSD symptoms. According to both the results of this study and the participants' narratives, individuals exposed to direct risk during the pandemic experienced more acute distress at the time of the event, sustained emotional arousal, heightened frustration, and increased signs of PTSD, alongside growing disillusionment with their work environment. Prior research similarly underscores that witnessing the sudden death of loved ones or colleagues constitutes a significant psychological burden for healthcare workers (HCWs), frequently serving as a precipitating factor in the development of PTSD [66–68, 75]. While HCWs recognize their duty to support the bereaved families of deceased patients, they also carry the weight of their own professional and personal grief—grief that has been intensified by the unprecedented nature of the COVID-19 pandemic. Amid the overwhelming demands and rapid spread of the virus, concerns for personal safety, the well-being of colleagues, and the health of loved ones often came into tension with HCWs' professional obligations. In light of the mental health risks associated with bereavement in the context of COVID-19, it is essential that HCWs be adequately prepared for the reality of patient and colleague death, and that they are equipped with the resources and support necessary for a healthy grieving process. Equally important is the responsibility of healthcare systems and institutional leadership to anticipate and address the psychological toll of bereavement. Organizational support mechanisms should be implemented to prepare HCWs—especially those newly entering the profession—who may lack experience with managing personal or professional grief and who are beginning their careers in a clinical landscape marked by high levels of disruption and emotional strain. Systematic preparation and ongoing psychological support are crucial to ensuring that HCWs are not only able to fulfill their roles effectively, but also to preserve their own mental health in the aftermath of loss.

Theme 4: seeking support

This theme includes four categories: social support, psychological support, and organizational support.

Social support

In the category of social support, participants identified several key sources: improved interpersonal communication, family support, support from colleagues and supervisors, media support, and broader community support. These findings reflect the recognition that recovery from loss is significantly facilitated by social support and the maintenance of cultural, familial, communal, spiritual, and religious customs surrounding death and mourning. Prior research has demonstrated the protective effect of social support in mitigating psychological harm

among healthcare workers (HCWs) during the COVID-19 pandemic [81, 82]. Consistent with these findings, a qualitative study by Romate et al. [35] highlighted the importance of social support as a central theme in understanding the experiences, perceptions, and needs of frontline HCWs in public hospitals in India. Participants in that study expressed a strong need for support from their social networks—including family, friends, supervisors, and colleagues [35]. Additional studies have identified high levels of social support as a key independent protective factor against the development of PTSD symptoms among HCWs [83]. For instance, Zhang et al. [83] found that HCWs who received family support during the pandemic were significantly less likely to experience PTSD symptoms. Similarly, Pan et al. [84] reported a strong inverse relationship between family support and PTSD prevalence among HCWs, which aligns with the findings of the present study [84]. A study conducted in Singapore further corroborates these conclusions, identifying multiple factors that help reduce PTSD symptoms: (a) clear and consistent communication regarding safety protocols; (b) opportunities for emotional expression and consultation; (c) familial support; (d) support from supervisors and colleagues; (e) reciprocal feedback between HCWs and their institutions; and (f) engagement in religious practices [85]. Taken together, these findings underscore the importance of providing comprehensive and multidimensional support systems—including familial, professional, community, and organizational support—to safeguard the mental health of HCWs.

Psychological support

Psychological support emerged as another essential strategy for enhancing support to healthcare workers (HCWs) facing post-traumatic stress disorder (PTSD) during the COVID-19 crisis. Key elements include reducing the stigma associated with COVID-19, facilitating rehabilitation after crisis situations, and strengthening coping skills during periods of difficulty and distress. Throughout the pandemic, HCWs often faced social rejection and avoidance by others who feared contagion—an experience that was frequently perceived as stigmatizing and isolating [43]. This social isolation is a recognized risk factor for the onset of PTSD [88]. Feelings of uncertainty, rejection, and stigma in HCWs' residential environments, stemming from their association with hospitals, further compounded their vulnerability to PTSD symptoms [10].

In a qualitative study by Poh et al., HCWs explicitly expressed the desire for greater attention to their mental health needs, emphasizing the importance of access to psychological interventions. These included counseling services, telephone helplines, and self-help resources, all of which were seen as vital tools for psychological resilience and recovery [90]. The importance of coping skills

for managing distress and adversity was also highlighted in the present study and is consistent with findings from earlier research [24, 79].

Extensive evidence suggests that psychological support is a critical predictor of work-related stress among emergency care workers [91, 92]. It is typically defined as the perception that one both needs and receives help from others, and that one belongs to a broader network of support [91]. A Dutch study [93] previously found a strong association between psychological support in the workplace and reduced incidence of PTSD among emergency care workers. Similarly, other studies [93, 94] have demonstrated that emotional support—particularly from managers and colleagues—is the most common form of assistance inversely associated with PTSD symptoms. In essence, the more emotional and psychological support HCWs receive (e.g., having confidants, being listened to, and experiencing empathy following a traumatic event), the lower their risk of developing or exacerbating PTSD symptoms [95, 96].

Organizational support

Organizational support was another key strategy proposed by healthcare workers (HCWs) to mitigate PTSD during the COVID-19 crisis. Participants emphasized the importance of ongoing monitoring and screening of HCWs, systematic workplace risk assessments, the implementation of regular training programs, the provision of short work breaks, formal recognition of HCWs' contributions, access to psychotherapy, training in psychosomatic techniques, and opportunities for group discussions on stressful experiences and events.

Consistent with the findings of this study, Sirois et al. [89] found that organizational support—along with positive work attitudes, timely and accurate information about disease outbreaks, access to adequate protective equipment, and systematic workplace risk assessments and training—was associated with lower levels of psychological distress in HCWs during infectious disease crises [34]. Similarly, routine health check-ups, as part of a proactive monitoring strategy, can help identify signs of psychological distress and assess whether appropriate coping strategies are being employed [97].

Organizations may employ validated screening tools—such as the PTSD Checklist for assessing post-traumatic stress symptoms, the Prolonged Grief Disorder Scale for persistent grief reactions, and the Patient Health Questionnaire (PHQ) for detecting symptoms of depression—to identify HCWs at heightened risk of mental health challenges [98]. Healy et al. [99] further confirmed the efficacy of supportive management practices in mitigating the psychological impact of workplace trauma. Their findings highlighted that empathetic, communicative, and anticipatory leadership fosters a supportive

organizational culture—one that values teamwork, interdisciplinary collaboration, and the recognition of HCWs' psychosocial needs following traumatic experiences.

Such a supportive environment, characterized by a strong social network of management and personnel, may serve as a psychological buffer against the detrimental effects of sustained occupational stress. Creating a safe narrative space—where HCWs can openly express their emotions and share their experiences of traumatic events—has also been identified as an effective strategy for reducing PTSD symptomatology [71].

In light of the ongoing threat of future pandemic waves, it is imperative to sustain and strengthen mental health support for HCWs. Healthcare leaders should adopt evidence-based, anticipatory strategies to prepare workers for high-stress scenarios. These include training HCWs in effective coping mechanisms, minimizing the development of PTSD and broader psychological distress, and promoting a culture of support among health professionals.

Theme 5: Self-care

Self-care emerged as a practical and essential strategy for mitigating symptoms of PTSD among healthcare workers during the COVID-19 crisis. This approach encompassed taking personal health responsibility, adopting a healthy lifestyle, and actively building resilience to buffer against PTSD.

Health responsibility

Health responsibility among healthcare workers (HCWs) encompassed various dimensions, including enhancing health literacy, engaging in self-care to prevent illness, caring for family members during periods of wellness, and actively participating in health-related decision-making. Consistent with the findings of the present study, prior research has underscored the critical role of health literacy and the dissemination of accurate, timely information in managing public health crises. Effective communication of health risks is a pivotal element in epidemic control, as it not only improves public awareness and reduces hazardous behaviors but also helps maintain trust in health systems. Conversely, misinformation and negative media portrayals during the COVID-19 pandemic heightened fear among HCWs and their families, ultimately undermining healthcare delivery [35]. The early proliferation of false information via mass media posed significant challenges to individual and systemic health outcomes [86]. Therefore, efforts to improve health literacy represent a vital self-care strategy. Although promoting COVID-19-related knowledge across diverse populations presents challenges, such initiatives are instrumental in enhancing adherence to precautionary measures [87]. Moreover, low perceived

control is recognized as a trans-diagnostic vulnerability factor contributing to negative emotional states such as anxiety and stress [88]. The literature suggests that fostering a sense of control—achievable at the organizational level through the provision of adequate resources enabling HCWs to manage infection risks—is essential for mitigating health-related distress [89]. These findings are consistent with the findings of the present study.

Healthy lifestyle

As the COVID-19 pandemic spread and persisted in Iran, it became increasingly evident that healthcare workers (HCWs) were unable to fully manage the escalating work pressure alongside symptoms of anxiety and PTSD. Consequently, many HCWs experienced a range of physical and psychological health problems. Adopting a healthy lifestyle has emerged as a direct and effective approach to promoting self-care and mitigating PTSD symptoms. The pandemic itself acted as a catalyst for change, encouraging the implementation of innovative self-care strategies focused primarily on avoiding high-risk behaviors, maintaining physical strength, undergoing regular testing, and dedicating time to sports and recreational activities. Participants in the present study emphasized that prioritizing a healthy lifestyle plays a crucial role in reducing PTSD symptoms and enhancing self-care among HCWs. Although significant advancements have been made in disease treatment, prevention through a healthy lifestyle remains one of the most effective defenses against COVID-19. Public health measures such as hygiene adherence and social distancing are essential to limiting viral transmission, while expanded testing capacity facilitates early case identification and containment [90]. Moreover, engaging in physical activity and recreation has been identified as a valuable coping mechanism for PTSD. Weight et al. [91] found that sports have beneficial effects on general health and provide the opportunity for positive interaction with others [91]. Furthermore, Soltaniyan and Aminbeidokhti [92] reported that HCWs who participate in sports exhibit lower levels of emotional fatigue compared to their non-athletic peers, regardless of gender [92]. Similarly, a study by Lange and Nakamura [93] show that while no univalent food, nutrient, or dietary supplement can prevent COVID-19, a moderate diet containing adequate amounts of a variety of macronutrients and micronutrients is essential for an optimally functioning immune system. Alcohol and tobacco consumption have harmful effects on the immune system. Therefore, controlling body weight, reducing smoking and limiting alcohol consumption are important preventive measures. In addition, adequate restorative sleep is required for proper immune system function. As a result, appropriate lifestyle changes related to nutrition, exercise, sleep, smoking, and alcohol consumption may help

to change the distribution of the risk of infection in the population and ultimately help to prevent the severe disease of COVID-19 [93]. Since preventive behaviors have been crucial during the pandemic to reduce disease, maintaining a healthy lifestyle continues to be identified as essential preventive behavior.

Resilience against PTSD

According to reports from healthcare workers (HCWs), resilience serves as a practical approach to mitigating symptoms of PTSD by enabling adaptation to stressors, adjusting motivations, regulating emotions, exercising self-control, fostering spiritual attachment, and promoting post-traumatic growth. Resilience is understood as a capacity that HCWs can develop and cultivate to survive and thrive amid the complexities encountered in hospital and clinical settings [94, 95]. The scientific literature on COVID-19's impact on mental health in Iran reflects a lack of comprehensive understanding of the major risks posed by the pandemic, compounded by the presence of unreliable information. Given that social support is crucial for coping with occupational stress, fostering a healthy lifestyle alongside enhancing HCWs' resilience emerges as a key strategy for improving their mental health outcomes. Similarly, Abdelsadig Mohammed et al. [96] identified personal characteristics such as resilience and optimism, as well as the implementation of effective coping strategies, as significant factors in reducing stress levels [96]. Indeed, when individuals adopt a positive attitude toward their work and environment, their physical and psychological well-being, as well as overall quality of life, tend to improve. Consequently, HCWs who demonstrate greater interest in their job or workplace are more likely to endure difficult conditions and experience less fatigue. Research by Moradi et al. [97] highlights the importance of screening for personality traits such as high neuroticism and low agreeableness among HCWs in clinical roles, suggesting that targeted interventions to modify these traits could be effective in preventing post-traumatic stress [97]. Furthermore, Musavi Asl and Parooie [98] showed that screening combined with positive psychology interventions enhances nurses' sense of coherence, resilience, and psychological well-being [98]. Omidi et al. (2022) also found that support from family, colleagues, and managers, as well as the subjective sense of being supported, improves quality of life and bolsters coping capacity in stressful situations [99]. Social support from family and close individuals is particularly vital during crises like pandemics, where empathy, companionship, active listening, and assistance in reducing individual responsibilities provide a strong buffer that enhances resilience and helps HCWs manage the heightened pressures they face.

Limitations of the study

The findings of the present study cannot be generalized to the broader population due to the inherent limitations of qualitative research. Nonetheless, the results provide valuable insights into the perceptions and experiences of healthcare workers (HCWs) within the Iranian context, which may share similarities with HCWs in other countries. Owing to a limited pool of eligible participants, the researchers were unable to conduct focus group discussions, and data collection was therefore restricted to individual semi-structured interviews. Additionally, the inclusion criteria may have introduced selection bias, as it is possible that participants were more inclined to participate due to their direct experiences with mental health challenges and PTSD symptoms, as well as their desire to share their perspectives. This is reflected in the notably rich and detailed responses to open-ended questions, indicating the depth of participants' emotions and the importance they attached to the opportunity to convey their views. Such extensive, nuanced feedback likely reflects both the frustration and concerns of Iranian HCWs regarding their mental health and workplace challenges. To enhance the generalizability of these findings, it is recommended that this qualitative work informs the development of a structured survey that could be distributed to a greater sample of study participants, the results could then perhaps be generalized to other study backgrounds.

Conclusion

The perception and experience of healthcare workers (HCWs) regarding PTSD caused by the COVID-19 pandemic encompassed five main themes: helplessness, poor risk management, life-and-death experiences, seeking support, and self-care. Overall, the present findings reveal a concerning portrait of many Iranian HCWs' mental health in the aftermath of the pandemic, particularly highlighting the profound impact on PTSD. Participants reported significant levels of stress, depression, anxiety, and PTSD symptoms, all of which severely affect their health and well-being. Furthermore, most HCWs conveyed feelings of helplessness, experienced inadequate risk management, endured life-threatening situations, and perceived a low level of support. Alarmingly, some participants expressed intentions to change their workplace or even leave the profession altogether—developments that could seriously disrupt the Iranian healthcare system. Given this context, a solution-oriented approach to future research and intervention design should be arranged by Iranian healthcare leadership potentially in collaboration with international stakeholders. Such efforts should aim not only to address the current healthcare workforce shortages in Iran but also to mitigate the looming global risk of healthcare personnel deficits. By

leveraging the core components identified in this study, healthcare systems can enhance the diagnosis, prevention, and management of PTSD related to COVID-19, ultimately improving the physical and mental health of HCWs. The insights gained here should be disseminated to experts, policymakers, and relevant health professionals to inform the development of effective, evidence-based, and cost-efficient interventions designed to better support healthcare workers during future pandemics.

Abbreviations

IES-R	Event Scale-Revised
HCWs	Healthcare workers
PTSDs	Post-traumatic stress disorder
WHO	World Health Organization

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

MK-P designed the project, collected the data, analyzed the data, and wrote the first draft of the manuscript. FY conducted the interview and participated in analyzing the data and writing the first draft of the manuscript. TP participated in analyzing the data. FY, MK, TP, KP, contributed to the interpretation of findings. MK-P and KP critically revised the final article. All authors read and approved the final manuscript.

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Data availability

Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate

The Ethics Committee of the Mazandaran University of Medical Sciences in Mazandaran, Sari, Iran, has approved the protocol for the current study [code number: IR.MAZUMS.REC.1402.476; Grant No. 18533]. All the study procedures were carried out under the principles in the Declaration of Helsinki 1964 and its amendments later on. Written and oral informed consent were obtained from the participants prior to participate in the study. And although all interviews were audiotaped and transcribed with the participant's consent. HCWs where be assured of the confidentiality of their information and identities. Furthermore, they were be informed that they had the right to withdraw from the study at any stage of the study, and that their decision to refuse contribution at any time was not influence or change the quality of services provided to them.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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