

## Review Article

# Healthcare Workers and Infectious Disease Outbreaks: A Review.

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### Abstract:

In last two decades the world assisted to an increase in the frequency of infectious disease outbreaks which are a challenge for health services and healthcare workers (HCWs). Infectious disease outbreaks cause an unexpected increase in morbidity and mortality, which in turn cause an increased demand on healthcare facilities and consequently an increase in Healthcare workers workload. A search was performed in PubMed selecting meta-analysis, reviews and systematic reviews published before July 2023. The search carried out resulted in abundant information on various aspects of HealthCare Workers's mental health during and after infectious disease outbreaks. A substantial number of HealthCare Workers suffer greatly from a variety of psychological and psychosomatic problems. The enormous psychological burden of working under such stressful circumstances can severely affect their wellbeing and, consequently, work performance. Health policies and interventions specifically aimed at these professionals should be taken in future infectious disease outbreaks.

**Key words: Infectious disease outbreaks, Healthcare workers, Mental health, Occupational health, Review**

### Introduction

In the last 20 years, climate change, overpopulation, environmental destruction, frequent zoonotic spill over, and poverty have contributed to an increasing occurrence of emerging and re-emerging infectious diseases. Notable outbreaks have included the 2003 severe acute respiratory syndrome (SARS) epidemic, the 2009 H1N1 pandemic, the Middle East respiratory syndrome (MERS) epidemic first reported in 2012, the 2014–2016 West Africa Ebola epidemic and coronavirus disease 2019 (COVID-19) pandemic (Busch et al., 2021).

Disease outbreaks cause an unexpected increase in morbidity and mortality, which in turn cause an increased demand on healthcare facilities. The rapid increase in patient populations drastically reduces the HCWs to patient ratio thus increasing workload (Chigwedere et al., 2021). Evidence from infectious disease epidemics has shown that healthcare workers are at risk of developing both short- and long-term mental health problems with up to one-third of frontline healthcare workers experiencing high levels of distress (Pollock et al., 2020). Hospital workers are especially susceptible to psychological illnesses because they are faced with the problems of caring for patients with life-threatening illnesses and injuries complicated by overwork, understaffing, tight schedules, paperwork, intricate or malfunctioning equipment, complex hierarchies of authority and skills, and dependent and demanding patients. In addition, with increasing size and bureaucracy of healthcare institutions because of mergers and acquisitions, the working environment may become depersonalized and many workers feel isolated, fatigued, angry, powerless, and frustrated (Udasin, 2000).

Human resource is one of the main elements that affect the efficiency of systems and has a key role in healthcare systems when comparing to other elements. In an emergency situation, healthcare centres and hospitals have to provide services for a large number of patients and the continuity of these services requires meticulous planning of healthcare officials and policymakers of the countries (Nafar et al., 2021). HCWs play a key role at all levels of caregiving, but these large-scale outbreaks have shown that the enormous psychological burden of working under such stressful circumstances can severely affect their wellbeing and, consequently, work performance. It will be vitally important to guarantee easy access for the entire healthcare workforce to psychological support structures so they can cope better with acute critical situations as well as prolonged periods of stress (Busch et al., 2021).

### Methods

A search was performed in PubMed, which is a search engine for free access to the MEDLINE database of citations and abstracts of biomedical research, developed by the National Library of Medicine (NLM) using the terms MeSH: Burnout, Infectious outbreaks, selecting meta-analysis, review and systematic review published before July 2023. For the structuring of this analysis, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyzes) model considered as indispensable to elaborate a systematic review or meta-analysis (Liberati et al., 2009) was applied. The inclusion criteria were: articles on Healthcare workers mental health during and after Infectious outbreaks written in English. Exclusion criteria were: duplicate articles, articles of opinion or reflection, articles written in languages other than English,

articles based on clinical cases and discordant articles for the purpose of review.

## **Results**

The search carried out resulted in the identification of 17 articles with abundant information on various aspects of HCWs's mental health during and after infectious disease outbreaks.

The frequency of disease outbreaks has increased over the past century (Chigwedere et al., 2021). Infectious diseases that were categorised by World Health Organization (WHO) in 2020 as "pandemic or epidemic diseases", included: chikungunya, cholera, Crimean-Congo haemorrhagic fever, Ebola virus disease, Hendra virus infection, influenza (pandemic, seasonal, zoonotic), Lassa fever, Marburg virus disease, meningitis, MERS, monkeypox, Nipah virus infection, novel coronavirus (SARS-CoV2), plague, Rift Valley fever, SARS, smallpox, tularaemia, yellow fever and Zika virus disease. While declarations of diseases as epidemics or pandemics are not always clear, and local outbreaks of a disease may or may not be categorised as an epidemic by government or health service organisations, the WHO plays a key role in international detection and classification of epidemics and pandemics (Pollock et al., 2020). Infectious disease pandemics entail the global spread of an emerging viral disease, while epidemics are defined as the spread of viral diseases over specific countries or continents. The globe has witnessed several infectious diseases' outbreaks, including Ebola, SARS and MERS (Hawsawi, 2022). Respiratory infectious pandemics and epidemics are particularly virulent given their spread via droplets and interpersonal contact (Fernandez et al., 2020). Meta-analysis in SARS and MERS confirmed that general populations had suffered mental health status disorders and psychiatric repercussions both acute and post-illness stage (Thatrimontrichai et al., 2021).

HCWs play a key role at all levels of caregiving, but these large-scale outbreaks have shown that the enormous psychological burden of working under such stressful circumstances can severely affect their wellbeing and, consequently, work performance. A substantial number of frontline healthcare workers suffer greatly from a variety of psychological and psychosomatic problems ranging from sleep disturbance, somatization symptoms, anxiety, and perceived stress to depression, post-traumatic stress disorder (PTSD), and burnout. The symptoms are commonly triggered by stressful, traumatic events and can have far-reaching consequences for healthcare providers' physical and psychological well-being, relationships to others, and performance at work. (Busch et al., 2021).

HCWs suffer from both physical and mental fatigue because their working hours are increased and they may be asked to work more night shifts; thus, they do not have enough time to sleep, rest, and recuperate. The massive influx of patients overwhelms the capacity of healthcare systems, giving rise to ethical dilemmas around the distribution of essential healthcare and medical supplies. HCWs constantly have to make "life or death" decisions, such as which patients to admit or not admit

into intensive care and when to withdraw life support. Due to the increased numbers of people dying, HCWs repeatedly break bad news, sometimes in ways they are not used to, including over the phone, thus making breaking bad news more distressing. The news of continuously rising numbers of confirmed cases and deaths is emotionally overwhelming. Working in direct contact with infectious patients was associated with higher levels of symptoms of anxiety, stress, insomnia, and depression due to the increased fear of contracting infection, greater concern of infecting family members, stigmatization, and isolation (Chigwedere et al., 2021).

A core element underlying the onset of global psychological distress could be the perceived lack of control of one's own professional and personal life. Lower educational level and socio-economic status are associated with worse physical and mental health. The psychological distress following an epidemic/pandemic tends to improve or worsen over time. High levels of stress, feeling of lack of control, anxiety, depression, insomnia – all symptoms with a high overall prevalence rate can represent, if not properly acknowledged and managed, precursors to allostatic overload as well as burnout syndrome. Negative effects of mental health may result unhealthy behaviours, such as alcohol, tobacco or drug abuse, which may contribute to reduced ability to function at work. Moreover, these unhealthy behaviours could also potentially be linked to family breakdown and domestic abuse, further increasing feelings of depression, anxiety and stress (Busch et al., 2021). Salient psychological responses that can persist beyond the outbreaks included anxiety/fears, stigmatization, depression, posttraumatic stress, anger/frustration, grief, and burnout, but also positive growth and transformation (Chew et al., 2020). Less-experienced workers might be more easily affected by unexpected situations that those who have completed several years of professional practice are more resilient and readier to handle difficult situations (Delle Donne et al., 2023).

Working in direct contact with infectious patients was associated with higher levels of symptoms of anxiety, stress, insomnia, and depression due to the increased fear of contracting infection, greater concern of infecting family members, stigmatization, and isolation. This might explain why nurses were found to be more stressed, anxious, depressed, and had poorer sleep quality compared to doctors. HCWs in the epicentre of a pandemic experienced more psychological distress compared to HCWs in other regions due to the higher exposure to infectious patients. Another occupational risk factor identified was the extent of healthcare experience that a HCWs had. HCWs with less work experience were more likely to be stressed compared to HCWs with more years of work experience. Less experienced HCWs have less knowledge, skills, and are less able to self-regulate, thus they get stressed more easily compared to more experienced HCWs who have more knowledge and skills, and are thus more able to adapt. Inadequate hospital equipment and the limited supply of personal protective equipment (PPE) were also associated with higher levels of psychological symptoms. Being of female

gender was also identified as a risk factor. A history of exposure to other traumatic events before an outbreak increased the risk of re-occurrence of a psychiatric disorder. Having a high perceived risk of infection and low self-efficacy were also identified as risk factors associated with mental health symptoms. HCWs who were unconfident about beating the outbreak were more depressed and had a poor mental state compared to HCWs who were more confident and resilient. Lack of knowledge of the virus and lack of outbreak management training was associated with low perceived self-efficacy. Constantly changing infection control measures and documentation processes also reduced self-efficacy and caused an increase in stress levels. Having been quarantined was identified as a risk factor of depressive and post-traumatic stress symptoms. This was attributed to the increased fear of dying from the disease. Quarantining was associated with increased levels of fear and stress in HCWs due to the emotional isolation and loneliness experienced during quarantine (Chigwedere et al., 2021). HCWs should be quarantined outside the healthcare facility, where they are not subject to work-related pressure. According to a 2015 study on the MERS epidemic, HCWs quarantined for an extended period at a hospital displayed depressive symptoms and acute stress disorder for longer durations than did their counterparts quarantined at home (Park et al., 2023).

### **Nurses and Physicians**

Nurses are pivotal to the health care response to infectious disease pandemics and epidemics. Nurses, as the largest group of health professionals are at the frontline of the health care system response to both epidemics and pandemics. Nurses deliver care directly to patients in close physical proximity and as such, are often directly exposed to these viruses and are at high risk of developing disease. Nurses' sense of duty, dedication to patient care, personal sacrifice and professional collegiality is heightened during a pandemic or an epidemic. Despite having a professional obligation to care for the community during a pandemic or epidemic, many nurses have concerns about their work and its impact on them personally. In particular, the risk of being infected, transmission to family members, stigma about the vulnerabilities of their job and restrictions on personal freedom have been reported as key concerns. (Fernandez et al., 2020).

Nursing is considered to be a high-stress occupation because of the perception of low job status, lack of participation in deciding work tasks, heavy workload, and unfavourable work environment (Udasin, 2000). These challenges contribute to developing several psychological symptoms of compassion fatigue (CF). CF has been described as physical and mental distress associated with the burden of helping. It can lead to medical errors, deterioration of relationships with co-workers and patients, and low work satisfaction and quality of care (Delle Donne et al., 2023). In times of infectious disease outbreaks, nurses are significantly vulnerable to developing several acute or chronic psychological symptoms of CF, including insomnia, fatigue, depression, and anxiety, which impact their health and patient care (Hawsawi, 2022).

Physician experiences psychological symptoms during infectious disease outbreaks, with consistent experiences reported across different disease outbreaks. The most common psychological symptoms measured with surveys or validated questionnaires reported included anxiety, depression, stress, fear, burnout, mental distress, PTSD. Worry about their families being infected during the outbreak was the greatest source of physician psychological symptoms. Other factors associated with poorer psychological outcomes included direct patient contact, single marital status (compared to married), younger age, and more junior career stage (Fiest et al., 2021). It is well established that physicians are under a high degree of emotional and psychological stress. Prolonged sleep deprivation, significant job demand, and high level of responsibility lead to elevated rates of depression, suicide, drug abuse, alcoholism, marital disruption, and burnout in residents and practicing physicians, particularly surgeons (Lester et al., 2012). During infectious disease outbreaks, female gender (compared to male) was the factor most commonly associated with worse psychological symptoms in physicians (Fiest et al., 2021).

### **Stigma**

The risk of stigma associated with an infectious disease may be elevated if the novel infectious disease is life-threatening with no known treatment or cure. Stigma refers to the attitude or belief that drives an individual to refuse, avoid, or fear individuals or groups linked to a specific trait (e.g., race, sex, and disease), event, or person. Stigma acts through a series of social processes involving categorization and discrimination against others, stopping them from seizing life. A study on MERS epidemic reported that stigma and discrimination associated with an infectious disease influenced the self-efficacy of HCWs and increased their psychological distress and physical symptoms. During a nationwide epidemic, the general population intentionally avoided HCWs and their families in public places such as work or school and strove to prohibit them from visiting public places, even work or school, out of fear of potential spread of the virus. Such behaviours and attitudes aggravate the suffering of HCWs because they add mental stress associated with the disadvantages they and their families could face in society, all while being tired and exhausted after caring for their patients. (Park et al., 2023). During the SARS outbreak, physicians of Asian descent felt more stigmatized than their Caucasian colleagues of Canada (Fiest et al., 2021).

### **Mobbing and burnout.**

Mobbing is defined as systematic and hostile attitudes of one or several people toward one individual with unethical communication. Mobbing is generally performed by management teams, but it can also be performed by colleagues, subordinates, or a group of employees. It has been specified that health professionals, particularly nurses, are at serious risk of being exposed to mobbing in the workplace. Mobbing leads to excessive stress, exclusion, anxiety, digestive system problems, sleep disorders, depression, anxiety, job dissatisfaction, and

burnout ([Ulutasdemir et al., 2015](#)).

Resilience as a dynamic, multifactorial process in which an individual can adjust to adversity, maintain equilibrium, retain some sense of control over their environment, and continue to move on in a positive manner. Often resilience is contrasted with the concept of burnout, which is characterised by distress and exhaustion, and dysfunction at work. HCWs commonly present high levels burnout, both during and after the outbreaks ([Pollock et al., 2020](#)).

Burnout, the leading result of emotional disturbance experienced by physicians, is a syndrome of emotional exhaustion, depersonalization, and reduced sense of personal accomplishment occurring in individuals who work in human services. Risk factors associated with burnout include high levels of sleep deprivation, anger, loneliness, regular alcohol use, anxiety, or work–life conflict. Protective factors include perceived support from other medical families, separation of personal and work life, time alone with mate, supportive work environment, religion or faith, regular time for exercise, hobbies or meditation, non–work and related vacation ([Lester et al., 2012](#)). Prior to the COVID-19 pandemic, studies reported that physicians experienced unprecedented levels of burnout. Burnout among physicians is reported to be as high and has been reported to be higher than registered nurses and respiratory therapists ([Fiest et al., 2021](#)). The prevention of burnout is possible through better professional recognition, the possibility of communicating among colleagues, to participate in teaching sessions or further training, improvement of working conditions and appropriate vocational training ([Mérat & Mérat, 2008](#)).

### **Occupational Health and prevention**

Health services are one of the work areas that contain important risks in terms of the occupational health and safety of the labourer. Professionals in various areas of health services encounter biological, chemical, physical, ergonomic, and psychosocial risks, particularly in hospitals ([Ulutasdemir et al., 2015](#)). Human resource is one of the main elements that affect the efficiency of systems and has a key role in healthcare systems when comparing to other elements ([Nafar et al., 2021](#)). In infectious diseases, epidemics developments, can quickly change professional exposures. The epidemiological evolutions of the infections, modify the risks and the work-related diseases. Their prevention requires an evaluation of work processes and attention of psychosocial data ([Pougnnet et al., 2017](#)).

[Woods et al. \(2023\)](#) purpose a framework where the interaction of various psychosocial factors (P), organizational conditions (O), and environmental exposures (E) can drive beneficial or detrimental outcomes for workers and enterprises during an infectious outbreak. Psychosocial and personal factors (P) are aspects of a worker's psychological state, such as mood, stress, cognition, and personality that contribute to physical and emotional health, use, safety, and the health and safety of others in the work setting. Furthermore, one's psychological state of mind is an important consideration when evaluating and tailoring intervention to promote worker or organizational

health. Similarly, social factors provide critical context. For example, experiencing social support inside and outside of work contributes to health, safety behaviours, and workplace interactions. Other social contexts such as type of job, cultural norms of region or workforce, and experiences of stigma or discrimination play a role. Work-related and personal trauma are also influential. Finally, personal characteristics such as demographic features (race, sex, sexual orientation, immigration status, age, and ethnicity) provide critical context given their interplay with social contexts, psychology, and other aspects as organizational conditions and environmental exposures. Organizational conditions (O) of work include the set of programs, policies, and environmental supports conducive to a healthy and safe workplace culture. Leadership commitment is central to the success of the POE framework because leaders set the tone for organizational efforts that support Total Worker Health by dedicating the necessary staff, time, expertise, and resources for effective implementation. Environmental exposures (E) include biological, chemical, mechanical/ergonomic, and physical hazards that are linked to worker illness and injury. Furthermore, physical comfort (eg, visual, thermal, noise) has also been linked to productivity gains and losses.

A number of strategies have been recommended to support the mental health and well-being of frontline health and social care professionals during disease outbreaks. These include accurate work-related information, regular breaks, adequate rest and sleep, a healthy diet, physical activity, peer support, family support, avoidance of unhelpful coping strategies (e.g. alcohol and drugs), limitation of social media use, and professional counselling or psychological services ([Pollock et al., 2020](#)).

Aside from actions directly at the provider level, like mental health prevention and support, protecting healthcare workers' psychological and physical well-being also includes actions taken at the organizational and structural level. Healthcare managers should ensure flexible work schedule which would allow healthcare providers to rest between tiring shifts and to maintain a healthy sleep hygiene, arrange for support systems for healthcare workers' families, and involve healthcare workers in decision processes to enhance their sense of self-efficacy and belonging. Finally, to reduce human and financial losses in potential future infectious disease outbreaks, healthcare institutions should plan ahead by creating infection control teams and developing strategies to optimize the supply of personal protective equipment ([Busch et al., 2021](#)).

In crises related with disease the most important challenges that countries identified were as follows: poor relationship of managers with personnel and lack of emotional support, family concerns, job security after returning to work, personnel fatigue and stress, moral dilemmas, lack of following the health protocols, patient care concomitant with fear, lack of presence of senior managers in the front line, inadequate training and practices, personnel pay and compensation system, problems in digital and health substructures, and structural weaknesses of the hospitals. Also, based on studies, the solutions were: good communication of managers with personnel and organizations,



developing supporting policies, enactment of maintenance regulations, providing and updating health instructions, developing the organizational culture and loyalty, public and religious support and appreciation, localization and using volunteers, enhancing the sense of responsibility and confidence, providing medicine and equipment, increasing the capacity of hospitals, and providing facilities for personnel and their families. It will be vitally important to guarantee easy access for the entire healthcare workforce to psychological support structures so they can cope better with acute critical situations as well as prolonged periods (Woods et al., 2023).

## Discussion

In last two decades the world assisted to an occurrence of emerging and re-emerging infectious diseases and an increase in the frequency of infectious disease outbreaks which are a challenge for Health services and HCWs. In these circumstances the massive influx of patients overwhelms the capacity of healthcare systems and HCWs are subjected to heavy workloads and pressures of all kinds while caring for patients. The impact of these crises on their lives and that of their families is immense and often unrecognized. Working in direct contact with infectious patients was associated with higher levels of symptoms of anxiety, stress, insomnia, and depression due to the increased fear of contracting infection, greater concern of infecting family members, stigmatization, and isolation. Also suffer from both physical and mental fatigue because their working hours are increased and they may be asked to work more and more as well as do more night shifts and they do not have enough time to sleep, rest, and recuperate. This affects not only their ability to care for their own health, but also their ability to care for their patients. They are the first to be called and the last to be served in terms of health care, and their needs are often unrecognized.

More studies are needed with other workers, essential to the management of major infectious diseases outbreaks. Pertaining to the less qualified staff and, usually, lower paid workers, hence members of more deprived social strata, these include staff in the health facilities, such as ward orderlies, administrative staff, porters, mortuary personnel, but also those involved in subsidiary functions such as ambulance staff and funerary workers, usually overlooked in the literature.

Furthermore, it must be noted that despite the overall relevance of the issues identified in the literature discussed here, the studies do not encompass the realities in diverse contexts owing to the diverse range of relevant factors that will influence the perceptions of all those involved. Health professionals belonging to the same categories in deprived areas and countries are likely to experience harsher conditions but, conversely, they may perceive their predicament in a manner that reflects the contingencies of their own circumstances.

There is now a vast and accumulated knowledge on how to prevent, alleviate and treat suffering caused by infectious disease outbreaks in HCWs that can persist for years after the outbreak. It is crucial that policy makers, public health authorities and occupational health services plan and anticipate

responses that can be quickly implemented in future infectious disease outbreaks.

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