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The Impact of epidemics on nursing workforce shortages and retention

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Abstract
Epidemics have consistently exposed and exacerbated critical vulnerabilities in healthcare systems, with particularly profound effects on the nursing workforce. These crises place unprecedented demands on nurses, magnifying pre-existing challenges and introducing new obstacles that compromise workforce stability and the quality of care delivered. This review provides an in-depth analysis of the multifaceted impact of epidemics on nursing shortages, retention, and overall workforce resilience, drawing on historical and contemporary examples from crises such as the COVID-19 pandemic, and the Ebola outbreak. Key challenges highlighted include overwhelming workloads, heightened infection risks, insufficient protective measures, and inadequate organizational support. These factors collectively lead to high rates of burnout, psychological distress, and increased turnover intentions among nurses. Additionally, epidemics exert a significant psychological toll on nurses, manifesting as anxiety, depression, moral distress, and in severe cases, post-traumatic stress disorder. The review explores how these mental health challenges further exacerbate staffing shortages by driving experienced professionals out of the workforce. By analyzing the underlying causes and consequences of these challenges, the review emphasizes the critical need for comprehensive interventions to strengthen workforce resilience and safeguard the nursing profession during future health emergencies.
Keywords; Nursing workforce, Epidemics, Burnout, Retention, Healthcare systems, Workforce resilience, and Organizational support

Introduction

The nursing profession has been integral to the functioning of healthcare systems for centuries, yet its workforce has continually faced significant challenges that epidemics have only magnified. Historically, the roots of modern nursing are deeply tied to crisis responses, such as the cholera pandemics of the 19th century and the nursing advancements during wartime under pioneers like Florence Nightingale **(Wang et al., 2021)**. Each crisis exposed vulnerabilities in staffing, training, and support systems, laying bare the systemic fragility of healthcare infrastructures worldwide. Epidemics not only intensify existing pressures on the nursing workforce but also create new challenges, such as heightened risks of infection, emotional strain, and moral dilemmas, which collectively undermine retention and morale **(Buchan et al., 2022)**. The HIV/AIDS epidemic of

the late 20th century serves as a stark example of the strain placed on nursing professionals. In many countries, particularly in sub-Saharan Africa, nurses faced overwhelming workloads due to high infection rates and limited treatment options. The stigma associated with the disease compounded these pressures, leading to moral distress and burnout among healthcare workers **(Denis, 2006).** Similarly, during the SARS outbreak in 2003, nurses in Asia bore the brunt of the healthcare response, often working under extreme conditions with inadequate protective equipment. Studies from this period highlighted heightened risks of psychological distress and turnover intentions among nursing staff **(Nickell et al., 2004).** Epidemics like the Ebola crisis in West Africa also showcased the critical but often precarious role of nurses in responding to large-scale health emergencies. In countries such as Sierra Leone and Liberia, nurses worked under immense pressure with limited resources and training. Many reported moral injury from witnessing preventable deaths due to insufficient staffing and supplies **(Kollie et al., 2017)**. These experiences underscored the urgent need for robust training, adequate protective measures, and mental health support to ensure the sustainability of the nursing workforce during such crises.

The COVID-19 pandemic further amplified these challenges, exposing gaps in workforce planning on a global scale. The rapid surge in demand for healthcare workers, coupled with increased infection risks, led to severe nursing shortages in both urban and rural settings. Nurses reported working extended hours in understaffed facilities, often without adequate personal protective equipment, which contributed to burnout and decreased job satisfaction **(Maben & Bridges, 2020).** Furthermore, the pandemic illuminated the lack of psychological support systems for nurses, many of whom experienced symptoms of anxiety, depression, and post-traumatic stress disorder as they navigated the crisis **(Lai et al., 2020)**. Historical and contemporary evidence highlights that epidemics act as stress tests for healthcare systems, exposing long-standing vulnerabilities. They reveal the fragility of workforce planning, the inadequacy of support mechanisms, and the critical need for investment in nursing retention and resilience. Addressing these systemic issues is essential to safeguarding the well-being of nurses and ensuring the continuity of care during future global health emergencies **(Kovacs et al., 2021)**. The aim of this literature review is to critically examine the impact of epidemics on nursing workforce shortages and retention. It seeks to explore the historical and contemporary challenges faced by nurses during large-scale health crises.

1. Nursing workforce shortages during epidemics

Epidemics, particularly COVID-19, have exposed and intensified existing nursing shortages worldwide, driven by a confluence of factors such as increased workloads, infection risks, and mental health challenges. During the COVID-19 pandemic, many healthcare systems experienced unprecedented staffing crises. Nursing homes in the United States reported severe staffing shortages, with more than one in five facilities lacking adequate personnel to meet patient care needs. These shortages were especially pronounced in facilities with COVID-19 cases among residents or staff, which heightened workload and stress levels for the remaining workforce **(McGarry et al., 2020)**. Rural areas faced unique challenges as their healthcare infrastructure struggled to cope with the pandemic's demand surge. Studies demonstrated that staffing deficits in rural nursing homes rose sharply with increased COVID-19 cases, suggesting a lack of resilience in workforce planning for these areas **(Yang et al., 2021)**.

The pandemic has also revealed systemic weaknesses in managing sudden surges in demand for nursing services. In Europe, for example, Spain relied on final-year nursing students to address staffing gaps, as hospitals restructured operations to accommodate rising COVID-19 caseloads. While this strategy alleviated short-term staffing needs, it underscored the precarious nature of the

workforce and the limited preparedness of health systems to face prolonged crises. Many student nurses reported emotional distress, unclear care processes, and inadequate training for such high-pressure roles **(Casafont et al., 2021)**. In the UK, advanced practice nurses (APNs) reported significant staff shortages during the first months of the pandemic, with 51% of surveyed nurses considering leaving their roles due to unsafe working conditions, lack of personal protective equipment (PPE), and emotional fatigue **(Wood et al., 2021)**.

Mental health issues, exacerbated by high workloads and inadequate support, have further intensified workforce shortages. Nurses have been at heightened risk of burnout, post-traumatic stress disorder (PTSD), and depression, leading to increased turnover. A study in Kenya found that nearly 50% of nurses directly involved in COVID-19 care reported significant symptoms of depression, anxiety, and burnout. Such mental health challenges not only reduced workforce capacity but also highlighted the need for comprehensive support systems to sustain healthcare delivery during prolonged epidemics **(Ali et al., 2021)**. Similarly, in the United States, many older nurses opted for early retirement due to the pandemic's risks, accelerating the exodus of experienced professionals and further straining the workforce **(Spetz, 2021)**.

Many nurses reported unsustainable workloads as patient numbers surged while staff numbers dwindled due to illness, quarantine, or departures. Studies indicated that this immense strain led to deteriorating job satisfaction, with nurses feeling unsupported and undervalued in their roles **(Peters, 2023)**. Compounding the issue was the lack of adequate mental health resources, which left many nurses grappling with anxiety, depression, and burnout. The situation was particularly acute in countries like South Africa and Ukraine, where existing vulnerabilities were magnified by the COVID-19 pandemic and other crises, such as armed conflict. In South Africa, the pandemic placed an extraordinary strain on an already overburdened healthcare system, leading to the exodus of healthcare professionals, including nurses. The financial and logistical limitations of the system made it challenging to replace lost staff or provide adequate support for those who remained. Nurses reported feelings of demoralization and helplessness, struggling to maintain quality care standards under overwhelming conditions **(Wyk & Naicker, 2023)**. In Ukraine, the dual burden of the COVID-19 pandemic and the ongoing war compounded nursing shortages to critical levels. The destruction of healthcare infrastructure and the displacement of healthcare workers intensified the crisis, leaving remaining nurses to handle overwhelming patient needs in dire conditions. The psychological toll on these nurses was immense, with many reporting emotional exhaustion and fear for their safety. The inability to deliver optimal care due to resource constraints added to their distress, further driving intentions to leave the profession. These dual crises underscore the urgent need for comprehensive strategies to support nursing staff during epidemics and other emergencies, addressing both immediate and long-term workforce challenges **(Wyk & Naicker, 2023)**.

COVID-19 pandemic created an urgent need for additional nursing staff to provide adequate care. This sudden demand exacerbated pre-existing shortages in the nursing workforce, stretching healthcare systems to their limits. Nurses were at the forefront of the crisis, managing critical care units overwhelmed with COVID-19 patients while also addressing routine healthcare needs. The International Council of Nurses (ICN) highlighted that the pandemic intensified systemic vulnerabilities in healthcare staffing, further complicating efforts to deliver quality care. Hospitals struggled to recruit sufficient nurses, and many relied on temporary or reassigned staff, which sometimes disrupted team cohesion and continuity of care **(International Council of Nurses, 2021)**. Research underscores the immense strain placed on nurses during this period, as they frequently worked extended hours under emotionally and physically taxing conditions. With

limited access to personal protective equipment (PPE) and other resources, nurses not only faced heightened workloads but also significant personal health risks. Shah et al. (2020) found that these challenges led to widespread fatigue, burnout, and job dissatisfaction, further depleting the workforce as some nurses opted to leave their positions or retire early **(Shah et al., 2021)**. This compounding effect of increased workload and insufficient staffing revealed critical gaps in workforce planning and emergency preparedness, emphasizing the need for resilient health systems capable of adapting to crises while safeguarding the well-being of healthcare professionals.

The Ebola outbreak similarly revealed the critical role of nurses in managing large-scale health crises and underscored the challenges they face in such scenarios. Insufficient staffing ratios during the outbreak often led to delays in patient care, compromising the quality of treatment and negatively impacting patient outcomes. In Sierra Leone, hospitals faced overwhelming patient loads, with nurses forced to work long hours under extreme conditions with limited resources. In one treatment center, where the patient-to-nurse ratio far exceeded safe thresholds, healthcare workers reported immense stress due to the high mortality rates and the emotional toll of witnessing preventable deaths **(Pooley, 2015)**. The lack of adequate protective measures and training further exacerbated this burden, as many nurses feared for their safety while providing essential care **(Cummings et al., 2016)**.The impact of the Ebola outbreak extended beyond immediate patient care, influencing the mental health and retention of nursing staff. Many nurses experienced moral distress, balancing their professional responsibilities against the personal risks to themselves and their families. Studies found that 29% of healthcare workers felt isolated, and 25% experienced workplace discrimination during the Ebola crisis **(Smith et al., 2017)**. Furthermore, the high infection rates among nurses in countries like Liberia created fear and uncertainty, discouraging others from joining the workforce. The compounded stress of inadequate staffing, lack of resources, and mental health challenges demonstrated the critical need for preparedness measures, including mental health support and sufficient staffing plans, to better protect nursing professionals during future epidemics **(Kollie et al., 2017)**.

2. Impact on retention

2.1. Increased Turnover Intentions

The retention of nursing staff during epidemics like Ebola and COVID-19 was significantly impacted by unsafe work environments, inadequate institutional support, and the mental health burden imposed by the crises. Epidemics not only exposed systemic deficiencies in healthcare systems but also pushed nurses to their emotional and physical limits, prompting many to consider leaving their roles or the profession entirely **(Fernandez et al., 2020)**. A UK study reported that during the COVID-19 pandemic, missed care due to staff shortages and lack of managerial support significantly demoralized nurses, exacerbating turnover intentions **(Senek et al., 2020)**.

Consequently, turnover intentions among nurses surged during the COVID-19 and Ebola pandemics, driven by multiple stressors, including unsafe working conditions, psychological distress, and inadequate institutional support. The COVID-19 pandemic, in particular, exacerbated an already fragile nursing workforce, with global studies showing a sharp increase in nurses expressing a desire to leave their positions or the profession altogether. A study conducted in Japan revealed that turnover intention was closely linked to insufficient time for relaxation and the unavailability of counseling resources, highlighting the critical role of psychological and organizational support in workforce retention **(Kitamura & Nakai, 2023)**. Another factor contributing to turnover intentions is "coronaphobia," or the excessive fear of infection. A study in the Philippines found that coronaphobia significantly increased turnover intentions among

frontline nurses, with nearly 26% of nurses considering leaving their jobs and 20% considering leaving the profession. However, social support and coping skills were shown to buffer this effect, reducing the likelihood of turnover **(Fronda & Labrague, 2022)**. Similar findings in Denmark demonstrated that nurses' perceived safety at work and trust in management were significant predictors of turnover intentions. Those who felt unsafe or unsupported were much more likely to leave their positions **(Nielsen et al., 2022)**.

Burnout was another critical factor driving turnover. In Iran, researchers found that emotional fatigue and a sense of reduced personal accomplishment were strong predictors of nurses' intention to leave during the pandemic. Nurses who lacked interest in continuing their roles or reported high burnout levels were significantly more likely to consider quitting **(Karimi et al., 2022)**. Similarly, in Canada, nurses caring for COVID-19 patients reported higher chronic fatigue, lower job satisfaction, and elevated turnover intentions, particularly when they felt unprepared for the demands of the crisis **(Lavoie-Tremblay et al., 2022).** The availability of personal protective equipment (PPE) also played a significant role. In Alabama, USA, frontline nurses cited insufficient PPE, inadequate psychological support, and overwhelming patient acuity as major contributors to their turnover intentions during COVID-19. Anxiety about personal health risks and a lack of support compounded these issues, further driving attrition rates **(Cole et al., 2021)**. Similarly, studies in Qatar found that stress and exposure to COVID-19-designated facilities increased nurses' turnover intentions compared to pre-pandemic levels, emphasizing the importance of addressing workplace stressors to retain staff **(Nashwan et al., 2021)**.

Organizational dynamics, such as perceived effort-reward imbalances, were also significant. A study in Germany found that nurses who felt undervalued or insufficiently rewarded were more likely to consider leaving their jobs. Depression, pre-existing illnesses, and department changes during the pandemic further exacerbated turnover intentions **(Schug et al., 2022)**. These findings underscore the importance of fostering a positive workplace environment to mitigate dissatisfaction and retain staff. Psychological resilience emerged as a protective factor against turnover intentions. A study in the Philippines demonstrated that resilience reduced the negative impact of compassion fatigue on job satisfaction and turnover intentions, highlighting the need for resilience-building programs in healthcare settings **(Labrague & De los Santos, 2021)**. Moreover, fostering a sense of workplace security was shown to decrease turnover intentions by improving nurses' engagement and commitment during the pandemic normalization phase in China **(Tang et al., 2022)**.

2.2. Psychological Impact

The psychological toll of pandemics on nurses has been profound, as these crises often amplify pre-existing mental health challenges while introducing new stressors. During the COVID-19 pandemic, nurses experienced high levels of anxiety, depression, stress, and sleep disturbances. A systematic review found that nearly one-third of nurses globally suffered from psychological symptoms, with a pooled prevalence of anxiety at 37%, depression at 35%, and stress at 43% **(Al Maqbali et al., 2021)**. Similarly, frontline nurses in China reported a 42.7% prevalence of somatic symptoms and an alarming rate of suicidal ideation (6.5%) during the peak of the pandemic **(Hong et al., 2021)**. In Wuhan, China, a study found that 60% of nurses working in COVID-19 care reported moderate to high levels of burnout and fear, with many experiencing severe anxiety and depression **(Hu et al., 2020)**. These mental health challenges were exacerbated by a lack of institutional support, highlighting the need for interventions such as psychological counseling and resilience training. Similarly, during the Ebola outbreak, healthcare workers in biocontainment units reported high levels of interpersonal stress and isolation, which contributed to feelings of

professional detachment and turnover (**Smith et al., 2017**). During the Ebola outbreak, similar patterns of psychological distress were observed. Nurses working in high-risk environments frequently reported symptoms of acute stress and burnout due to the emotionally taxing nature of their roles. A study found that nurses caring for Ebola patients experienced prolonged feelings of helplessness, compounded by witnessing high mortality rates among patients and colleagues. These experiences led to chronic stress and a pervasive fear of infection, highlighting the need for better mental health support during such crises **(Preti et al., 2020)**.

Organizational factors also played a crucial role in influencing the psychological well-being of nurses. A Taiwanese study found that redeployment, increased working hours, and occupational stigma were associated with higher levels of burnout and depression among nurses. However, institutions that provided adequate compensation and protective equipment managed to mitigate some of the adverse mental health outcomes (**Li et al., 2021**). This underscores the importance of institutional strategies in alleviating psychological distress. Psychological resilience emerged as a protective factor against burnout and mental health deterioration. Studies suggest that interventions fostering resilience, such as Acceptance and Commitment Therapy (ACT), can significantly reduce the psychological impact of crises on nurses. Resilience training helps nurses maintain emotional balance and enhances their capacity to cope with the challenges of frontline care **(Chong et al., 2023**).

2.3. Organizational Deficiencies

Nurses often cited inadequate organizational support as a key reason for leaving during pandemics. In the UK, advanced practice nurses reported shortages of staff and PPE, with nearly half considering job changes during the COVID-19 crisis. This reflects systemic failures in addressing workforce needs during emergencies **(Wood et al., 2021)**. In Canada, many nurses expressed dissatisfaction with the lack of national strategies for retention, advocating for enhanced workforce planning and improved working conditions to address retention challenges (**Tomblin Murphy et al., 2022**). Organizational deficiencies in healthcare systems became starkly evident during the COVID-19 and Ebola pandemics, as they placed extraordinary demands on already fragile systems. A study conducted during the COVID-19 pandemic revealed that nurses experienced significant challenges, including inadequate staffing, unclear communication from leadership, and a lack of critical resources, such as personal protective equipment (PPE). These deficiencies not only increased workloads but also placed nurses at greater risk of burnout and turnover **(Arnetz et al., 2020)**. Similarly, frontline nurses in Saudi Arabia reported that nearly half perceived suboptimal organizational support, with deficiencies in workplace safety measures and inadequate access to essential tools and information during the crisis **(Asiri et al., 2022).** During the Ebola outbreak, organizational failures were linked to delayed responses to escalating healthcare needs. Insufficient infrastructure and training left nurses unprepared to manage the demands of infectious disease care, leading to fear and stress among healthcare workers. A study from Sierra Leone highlighted how poorly coordinated logistics and supply chains severely hampered the ability of nursing staff to perform their duties safely and effectively (**Jones-Konneh et al., 2017**).

Another critical issue during the COVID-19 pandemic was the lack of equitable workload distribution. Nurses in intensive care units (ICUs) reported significant dissatisfaction with human resource allocation, as many were redeployed to high-pressure areas without adequate training or psychological preparation. These deficiencies increased the likelihood of errors in care and compromised patient outcomes (Li et al., 2021). Similarly, nurses in Iran identified unsafe work conditions and the lack of workforce protection as major challenges, emphasizing that poor organizational planning exacerbated feelings of vulnerability and exhaustion **(Shahmari et al.,**

2024). Communication breakdowns between leadership and staff further undermined trust and morale during these crises. In Italy, frontline nurses highlighted the confusion caused by inconsistent policies and rapidly changing directives, which hindered their ability to deliver quality care. Clear and transparent communication was identified as a critical factor in reducing stress and improving team performance (**Catania et al., 2020**). The impact of organizational deficiencies extended beyond immediate operations to the psychological well-being of nurses. A Japanese study found that perceived injustices, such as an imbalance between effort and reward, were strongly associated with serious psychological distress among hospital nurses. Addressing these imbalances through equitable reward systems and improved procedural justice was deemed essential for sustaining morale (**Ikeda et al., 2024**).

Interventions aimed at addressing these deficiencies have demonstrated promising results. Healthcare organizations that implemented structured training programs and adequate safety protocols reported higher levels of nurse retention and job satisfaction. In Taiwan, providing fair compensation and sufficient PPE significantly reduced burnout and turnover intentions among nurses (**Li et al., 2021**). Similarly, ICU staff in Italy reported feeling safer and more confident when organizational models prioritized workforce safety and provided transparent operational protocols during COVID-19 (**Conoscenti et al., 2022**).

2.4. Workload and role expansion

Increased workloads and expanded roles during pandemics further strained nurses, particularly those on the frontlines. In New Jersey, nurses reported that high patient-to-staff ratios and the added burden of infection control protocols during COVID-19 disrupted patient safety and care quality, leading to feelings of professional inadequacy (**Pogorzelska-Maziarz et al., 2021**). Similarly, during the Ebola crisis, nurses faced challenges in managing high patient loads while adhering to strict biosafety protocols, leading to delays in care and heightened stress (**Cummings et al., 2016**). Nurses were often required to work extended shifts under conditions of high patient acuity and staffing shortages, resulting in chronic fatigue and burnout. A study conducted in Indonesia at the COVID-19 National Emergency Hospital highlighted that 57.1% of nurses reported a consistently high workload. Psychological stress emerged as the most challenging factor, with nurses struggling to handle the unique needs of COVID-19 patients while ensuring safety and adhering to rigorous infection control protocols (**Setiyowati et al., 2023**). This trend was mirrored globally, as ICU and emergency nurses in Spain also reported an increased patient-to-nurse ratio, leaving them physically exhausted and emotionally depleted (**González-Gil et al., 2020**).

Role expansion was another significant impact of the pandemic. Nurses were frequently redeployed to high-pressure units, such as ICUs, even when their prior expertise did not align with the critical care requirements. In China, latent class analysis revealed that 62.5% of frontline nurses experienced high mental workload and low self-evaluation, reflecting challenges associated with role adaptability and the psychological toll of their responsibilities (**Wu et al., 2021**). Similarly, in Austria, nurse managers reported dual burdens of clinical and managerial responsibilities, underscoring the need for clear delineation of roles and robust support systems during pandemics (**Hoedl et al., 2024**). During the Ebola outbreak, workload challenges were comparable. In Sierra Leone, nurses were often the sole healthcare providers in severely understaffed treatment centers, managing overwhelming patient loads while adhering to strict biosafety protocols. These demands not only delayed care but also amplified stress levels, highlighting the vulnerability of healthcare systems during large-scale epidemics (**Jones-Konneh et al., 2017).** The physical and mental toll of these conditions often resulted in reduced job performance and long-term health consequences

for nurses, as observed in Iranian hospitals during the COVID-19 crisis, where frustration from high workloads negatively correlated with job satisfaction **(Pourteimour et al., 2021)**.

Nurses from underrepresented groups often faced additional challenges during pandemics. Studies found that ageist policies, micromanagement, and a lack of inclusion in decision-making processes significantly affected older nurses' willingness to remain in the workforce during COVID-19 (**Sheppard et al., 2024**). These inequities contributed to increased turnover, underscoring the importance of creating inclusive policies to enhance job satisfaction. In response to these challenges, innovations in nursing practice and policy emerged. For example, nurses increasingly embraced telehealth to extend patient care while reducing exposure risks. This shift not only mitigated some workload pressures but also demonstrated the adaptability of the nursing profession in managing crises **(Jadhav, 2024)**. However, the overall increase in workload and role expansion during pandemics underscores the critical need for workforce planning, adequate staffing, and mental health support to safeguard nurses and maintain the quality of care.

In conclusion, Epidemics have repeatedly illuminated the vulnerabilities within healthcare systems, with the nursing workforce bearing the brunt of these crises. The compounded effects of overwhelming workloads, heightened infection risks, inadequate protective measures, and limited organizational support have exacerbated burnout, psychological distress, and turnover intentions among nurses. These challenges not only jeopardize workforce retention but also compromise the quality of patient care during critical periods. To address these systemic issues, it is imperative to adopt comprehensive interventions, including robust workforce planning, equitable resource distribution, and effective mental health support systems. Organizational deficiencies during pandemics have profound implications for both healthcare delivery and workforce sustainability. Addressing these issues through proactive workforce planning, transparent communication, and equitable resource allocation is critical to strengthening healthcare systems and supporting nurses during future crises.

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