


Interventions to Improve the Willingness to Work Among Health care Professionals in Times of Disaster: A Scoping Review

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Abstract

The critical role of the health workforce in the function of the health care system is undeniable. In times of disaster and public health emergency, the importance of this valuable resource for the organization multiplies. This scoping review was conducted to identify, analyze, and categorize interventions to improve willingness to work in times of disaster as well as the existing knowledge gaps in the topic. For this purpose, four databases were searched. These included Scopus, PubMed, WOS, and World Health Organization observatory, and they were searched for papers published from July 2000 to September 2020. Studies of the English language that described strategies to improve human resources for health willingness to work during times of disaster/public health emergency were included. Full-text papers were screened by authors and data extraction was done according to self-designed form. Framework analysis identified key interventions based on human resources for health action framework. From 6246 search results, 52 articles were included, a great portion of which was published in 2020 probably due to the COVID-19 pandemic. Northern America was the region with most studies. From 52 included studies, 21 papers have reported the interventions to improve willingness to work and 31 papers have explored factors that affected a willingness to work. The interventions used in the studies were categorized into five themes as Leadership, Partnership, Financing, Education, and Organizational policies. The most and least interventions were financial and partnership respectively. The review identified a wide range of feasible strategies and interventions to improve human resources for health's willingness to work at times of disaster that are expected to be effective. Organizations should let the staff know these decisions and as a necessary step in every organizational intervention remember to evaluate the impacts.

Keywords

Willingness to work, Health workforce, Disaster, interventions, Scoping

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Highlights

What Do We Already Know About This Topic?

Disaster and emergency conditions put health care professionals under extreme pressure. The 2019 Coronavirus pandemic showed that health care organizations without motivated and efficient human resources could not achieve disease control and prevention. Therefore, health managers and policymakers have an important role in implementing effective measures to improve retention and willingness to work.

How Does Your Research Contribute to the Field?

This review revealed a wide range of approaches on how to address intervention improves willingness to work in times of disaster. The findings revealed a strong perception that the “Battle Buddy” system that is derived by the US military for psychological support should be implemented to increase the resilience of frontline health workers.

What Are Your Research’s Implications Toward Theory, Practice, or Policy?

Generally, the result of study will help policymakers take steps to manage and mitigate the negative effects of emergency conditions and developing evidence-based roadmaps, strategies, and interventions for moving forward.

Background

Due to the nature of sensitive professions, health workers are constantly exposed to burnout, so the phenomenon of leaving the service is one of the main challenges for managers and policymakers of health care systems in many countries.¹

This becomes more of a problem when pandemics and emergencies occur because they must be available for rescue operations by wearing heavy protective clothing at all hours of the day and night, and therefore the most high-risk group in terms of susceptibility to disease, especially infections.

These factors cause stress and physical, mental, and psychological pressures on the treatment staff, which puts them in a dilemma of staying and going.^{2,3}

Studies show that in Germany 28% of health care workers (HCWs) would avoid reporting to work and providing service in pandemics. Other studies in the USA show that 42.6% of HCW are unwilling to respond to the future events of an influenza pandemic. This portion is 21.7% for the next SARS epidemic.^{4,5} Today, the world is struggling with the COVID-19 pandemic which has involved 112, 660, 768 people till February 24, 2021 as the WHO reports.⁶

This outbreak sets new challenges in the way of human resource management including uncertainty, lack of preparation, financial limitation, exacerbating psychological problems, burnouts, and potential threats to both workers’ health and the safety of loved ones due to the contagious nature of the disease.^{7,8}

Studies that consider the COVID-19 pandemic a long-term disaster suggest factors and interventions that can be used to increase HCWs’ willingness to respond as a vital part of managers’ plans for the future.^{9,10} Many studies have been conducted to find factors affecting willingness and effective interventions in similar situations and in recent years, the

number of similar studies has shown significant growth in number which can be due to an increase in the occurrence of contagious disease outbreaks, wars, and other long-term and complex disasters.^{11–14}

Since the start of the COVID-19 outbreak, health care professions have worked in the frontlines of the response to the pandemic for more than one year and the situation is yet to improve so there must be evidence-based plans to increase the system’s rate of recovery and preparation for next waves of the outbreak.

This study is a scoping review of effective interventions to increase HCW’s retention and willingness to work during long-term and complex disasters. It aimed not only to report major factors that affect the willingness and effective interventions that can be implemented to control these factors but also to consider and report evidence gaps to be focused on in future studies. It also focuses on finding appropriate interventions and using them to make policies that would help increase the workforce’s willingness to respond in many affected countries.

Methods

Design

This scoping review was conducted based on Arksey and O’Malley framework. It consists of five stages: scoping, searching, screening, data extraction, and data analysis.¹⁵ Although these stages are stated linearly, a visualized figure was developed to fill any potential overlap (Figure 1).

Among 14 types of reviews,¹⁷ scoping review was selected because it is characterized by the inclusion of a wide range of study designs and outcomes, which enables exploration of the literature in a specific issue and displays the nature of background knowledge.

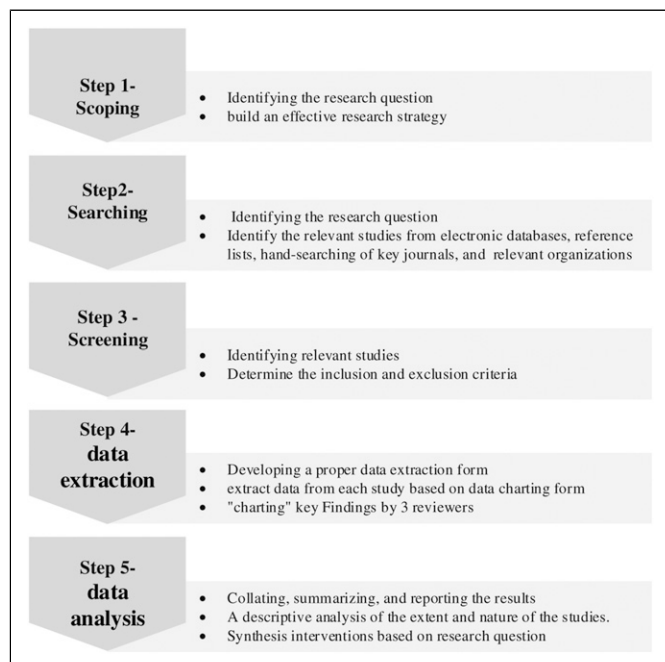


Figure 1. The Arksey and O'Malley steps for scoping review.¹⁶

Scoping

To become familiar with the existing literature, an exploratory search in MEDLINE using MeSH term (Medical Subject Headings) was conducted. The objective was to examine examples of potentially relevant studies and based on that information, inform the development of preliminary eligibility criteria and generate a more elaborate search strategy. Authors screened titles and abstracts. Together, they developed eligibility criteria based on the research question.

Eligibility Criteria

Inclusion criteria. Articles considered disasters which engaged health care system directly, those studied HCWs as a target population, and only English articles are included in this study.

Exclusion Criteria

Conference papers and abstracts as well as studies that did not report strategies and interventions related to willingness to work were excluded. Also articles studied short-term disasters were excluded.

Searching

In the scoping step, a comprehensive search strategy was cooperatively developed by using the eligibility criteria

provided and sharing exemplar studies with a medical librarian. This was according to the Peer Review of Electronic Search Strategy reporting guidelines.

PubMed, Scopus, and WOS were used as databases to search for the required information and studies published till the end of September 2020 were used. Some specialized journals, Google Scholar, and the websites of WHO and World Bank (WB) were also searched. All the references in eligible studies were also scanned to identify additional evidence. Table 1 presents specific search queries used in the PubMed database.

Screening

Initially, the titles of all articles were reviewed and articles that were incompatible with the aims of the study were excluded. Subsequently, abstracts and full texts of the articles were studied. Studies that did not meet the inclusion criteria and had poor correlation with study aims were identified and excluded, respectively. A researcher-made data extraction form was developed to extract data. At first, as a pilot for data extraction form, the data of 52 papers were extracted.

Since it was essential to study the full text of the included studies to extract data, this was conducted by the research team in two stages. However, in the third and fourth stages of the Arksey and O'Malley frameworks after the initial extraction of the data from the selected studies, the research team re-examined the data in two sessions carefully and finally, the studies were re-screened by the research team to include precisely relevant and high-quality studies.

The authors independently screened all titles and abstracts and Inconsistencies were resolved by retrieving full-text items, which were screened concurrently with data extraction.

Data Extraction

A data extraction form was developed by two of the authors to collect information on study characteristics including author, publication year, country, study objective, study design, main intervention, and findings. The authors extracted data from all articles.

Data Analysis

Framework analysis was applied to synthesize the data, which is a process for identifying, analyzing, synthesizing, and reporting patterns within the text and is generally used in qualitative data analysis. Therefore, the first and second authors qualitatively analyzed the included papers through framework analysis.

The steps for data analysis consist of: Familiarity with the text of articles (immersion in article results by reading several times), identifying and extracting primary codes, organizing codes into related themes, reviewing and completing the results of each theme with the use of results of the articles, and ensuring the reliability of the themes and the

results extracted in each theme (In cases of disagreement between the two authors, the dispute was referred to the third researcher). Endnote X9 software was also utilized to organize, as well as identify duplicates. Textual data were analyzed using a thematic analysis approach manually.

Furthermore, to categorize the extracted data according to the areas of human resources for the health action framework,^{6,18} and the components of the health system (Figure 2), studies were again reviewed by three researchers and the areas and functions appropriate to the intervention were selected. In case of disagreement between researchers, the study was reviewed by a fourth person who was an expert, and with the authors' consensus, the proper function was selected.

Results

From 6246 search results, 2890 were excluded as duplicate papers, and 3013 were omitted in the stage when titles and abstracts were reviewed. Also, of the 343 articles entered in the full-text review phase, 291 were excluded due to lack of appropriate information and lack of reporting of the required information as well as re-screening of the full-text. Finally, 52 articles were included in the study. Figure 3 displays the PRISMA flowchart. Among 52 studies, 21 papers discussed the interventions related to willingness to work under emergency conditions and pandemics and 31 papers elaborated the main factors that could be considered in the disaster status.

Table 1. Specific search queries, PubMed databases.

Database	Search String
Pubmed	<ol style="list-style-type: none"> 1. (((“HCW” [Title/Abstract] OR “Health Care Workforce” [Title/Abstract] OR “Workforce” [Title/Abstract] OR “Staff” [Title/Abstract] OR “health workforce” [MeSH terms] OR “health care worker*” [Title/Abstract] OR “health manpower*” [Title/Abstract] OR “manpower*” [Title/Abstract] OR “hospital staff*” [Title/Abstract] OR “employee*” [Title/Abstract] OR “health personnel*” [Title/Abstract] OR “physician*” [Title/Abstract] OR “Doctor*” [Title/Abstract] OR “Nurse*” [Title/Abstract]) 2. AND (“Willingness” [Title/Abstract] OR “Retention” [Title/Abstract] OR “Turnover” [Title/Abstract] OR “Retain*” [Title/Abstract] OR “Resilience” [Title/Abstract] OR “Maintenance” [Title/Abstract] OR “Maintaining” [Title/Abstract] OR “ability to care” [Title/Abstract] OR “ability to work” [Title/Abstract]) 3. AND (“Disaster*” [Title/Abstract] OR “Crisis” [Title/Abstract] OR “Emergency” [Title/Abstract] OR “Pandemic*” [Title/Abstract] OR “epidemic*” [Title/Abstract] OR “Preparedness” [Title/Abstract] OR “complex disaster” [Title/Abstract] OR “COVID” [Title/Abstract] OR “Ebola” [Title/Abstract] OR “Zika” [Title/Abstract] OR “SARS” [Title/Abstract] OR “MERS” [Title/Abstract] OR “Cholera” [Title/Abstract] OR “Plague” [Title/Abstract] OR “Influenza” [Title/Abstract]) (4. NOT (“Drug*” [Title/Abstract] OR “Treat*” [Title/Abstract] OR “Patient*” [Title/Abstract] OR “Animal” [Title/Abstract] OR “Ventilation” [Title/Abstract] OR “Transmission” [Title/Abstract] OR “Symptoms” [Title/Abstract] OR “vaccination” [Title/Abstract]) 5. (#1 AND #2 AND #3) NOT #4

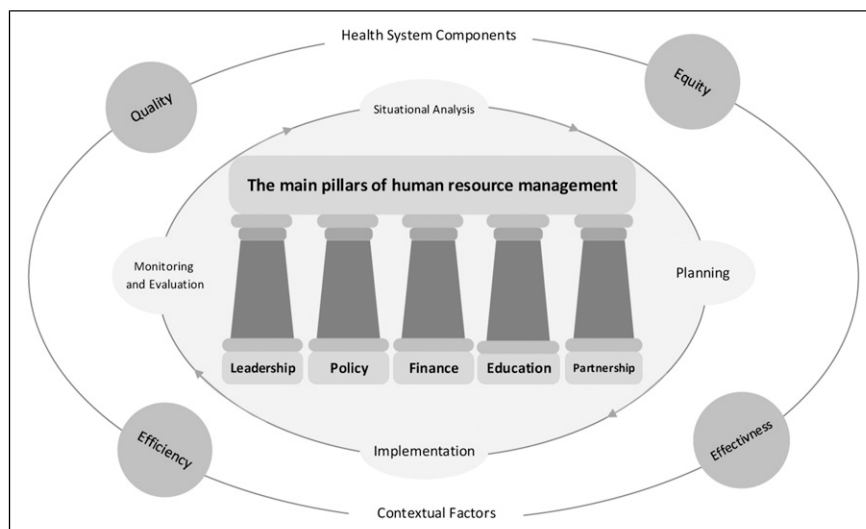


Figure 2. Human resources for health action framework.

Trend of Publication

The time trend of the studies' publication shows that most of the studies were published in 2020 because of the COVID-19 pandemic. In addition, an aggregation of papers is observed in 2015–2017 that occurred as a result of Ebola epidemics around the world. We can see a plateau of studies on the chart between 2009 and 2014 that was the result of influenza and MERS pandemics. Other disparities in time trend of publication are related to ones conducted to study wars or other crises and disasters distributed in different years. (Figure 4)

Country of Study

Study characteristics are presented in Table 2. Studies (N=52) were conducted in **Canada, United States, Australia, China, Japan, Taiwan, United Kingdom, India, Iran, Israel, Indonesia, Yemen, Germany and west African countries**. Most studies were in Northern America with USA (16 studies) and Canada and the least were in Southern America that were not conducted any studies. Figure 5 illustrates the geographical distribution of included studies.

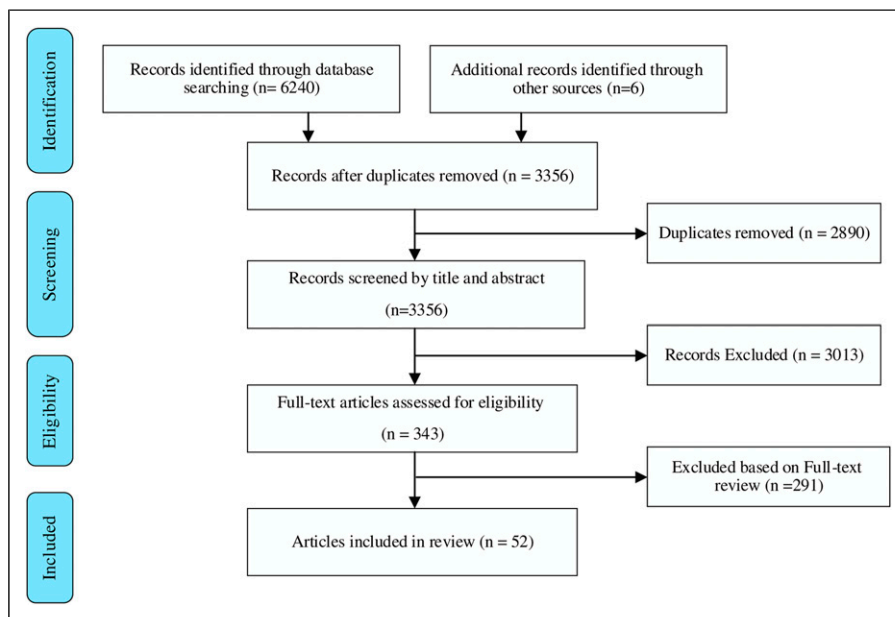


Figure 3. PRISMA flow diagram.

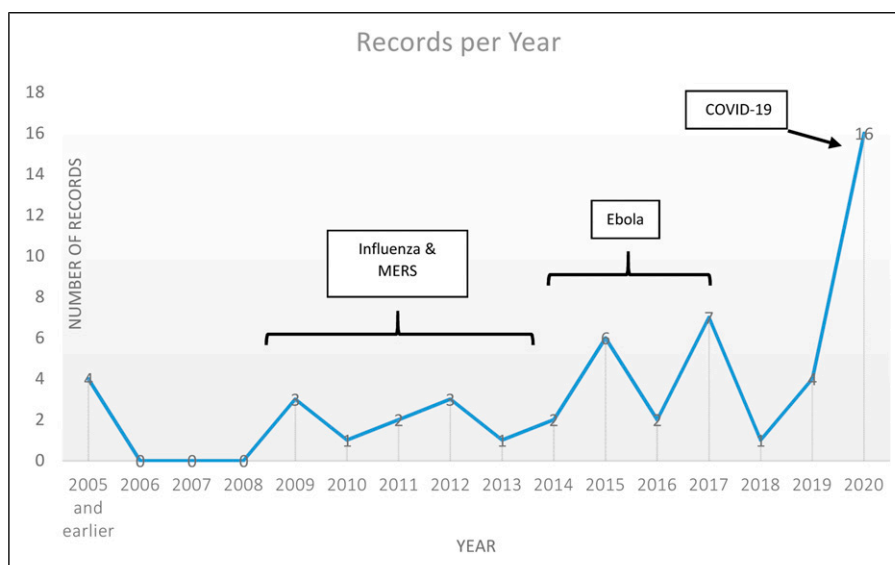


Figure 4. The time trend of studies' publication on willingness to work under disaster condition.

Table 2. Characteristics of included studies considering interventions to increase health care workers' willingness to work in.

Author, year, country	Title	Study design	Participants	Intervention
Yonge, Canada, 2010	Willingness of university nursing students to volunteer during a pandemic	Cross-sectional	Nursing students	Education, particular on infection control measures, has been very useful in decreasing fears associated with influenza outbreaks and the resulting absenteeism. Incorporating emergency response teaching into the nursing curriculum could be a proactive method of preparing student nurses for a more active role in the event of a pandemic. PPE should be prepared
Imai, Japan, 2015	Perception in relation to a potential influenza pandemic among health care workers in Japan: Implications for preparedness	Cross-sectional	HCW	Prepandemic planning is essential to maintain the continuum of care. On-line training module, one-day exercise on pandemic influenza and disaster training exercises are educational interventions affecting HR willingness
Shannon, USA, 2019	Improving student engagement in community disaster preparedness	Longitudinal study	Nursing students	Interventions suggested by this study are as follows: Curricular integration, deliver disaster response, education using a variety of methods (seminar, games, social media [SM]), simulations, tabletop exercises, and online gaming)
Sadati, Iran, 2020	Nursing experiences of COVID-19 outbreak in Iran: A qualitative study	Qualitative study	Nurses	Interventions suggested by this study are as follows: Recognizing and reinforcing religious values and introducing them, to educational and ethical systems are recommended to provide reducing social stigma, family protection and PPE
Veitch, UK, 2020	Nurses need support during Covid-19 pandemic	Letter	Nurses	Interventions suggested by this study are as follows: Online staff forum called "wobble rooms." These are regular, brief, small-group processes using videoconferencing, to which staff self-refer. They are open to all staff, clinical, and nonclinical. Wobble rooms also have a physical embodiment termed "staff chill-out rooms." These are safe places, off base/ward but easily available 24 hr a day, offering comfort, distraction (music/reading materials), foodstuffs, relaxation, and episodes of facilitated reflection, exercise and peer support
Chuan, Taiwan, 2020	Maintaining mental health among medical staff during the COVID-19 pandemic: Taiwan's experience	Experience report	HCW	Interventions suggested by this study are as follows: To establish a team to support the mental health of medical staff, training courses on proper use of personal protective equipment (PPE), holding lectures to provide the medical staff up-to-date knowledge and information about COVID-19, clear messages, rationale, and guidance for evolving standards of practice should be relayed, to inform medical staff if there are any confirmed COVID-19 cases currently being treated at the hospital, establishing an online reporting platform and screening algorithm for staff to self-report their physical and mental statuses, making an effort to recognize high-risk staff members. If necessary, relaxation technique training can be provided to help staff members manage stress and improve sleep quality. Establishing a hotline that allows medical staff rapid access to psychosocial assessment, counseling services, and psychiatric evaluation or treatment, supporting staff quarantined at home remotely to alleviate loneliness, keeping in touch with the team, providing upto date information on the situation at the hospital, ensuring a sufficient stockpile of PPE. The executive hospital administrators should personally visit the frontline staff to attend to their needs and show gratitude with a reward. as a way to honor their hard work

(continued)

Table 2. (continued)

Author, year, country	Title	Study design	Participants	Intervention
Hendel, Israel, 2000	Strategies used by hospital nurses to cope with a national crisis	Cross-sectional	Nurses	Emergency network, increasing working shifts to 12 hours, childcare in campus and having an obvious treatment protocol are suggested in this article
Nadler, Canada, 2020	Strategies to support health care providers during the COVID-19 pandemic	Letter	HCW	Interventions suggested by this study are as follows: Group making mental toolkit connectedness e-interventions
Albott, USA, 2020	Battle buddies: Rapid deployment of a psychological resilience intervention for health care workers during the coronavirus disease 2019 pandemic	Letter	HCW	Interventions suggested by this study are as follows: Organizational: Battle buddy system; unit level support; individual support- individual strategies: Sleep communication,...
Klomp, Africa, 2019	CDC's multiple approaches to safeguard the health, safety, and resilience of Ebola responder	Special report	CDC responders	Interventions suggested by this study are as follows: Predeployment training, preassessment training, post outreach
Liang, China, 2020	Mental health in frontline medical workers during the 2019 novel coronavirus disease epidemic in China: A comparison with the general population	Cross-sectional	HCW	Interventions suggested by this study are divided to leadership, evidence-based, organizational structure, training
E Huang, USA, 2020	Primary care mock codes during a pandemic: Interprofessional team-based emergency education while maintaining social distance	Trial	Primary care offices	Online training
L Huang, China, 2020	Factors associated with resilience among medical staff in radiology departments during the outbreak of 2019 novel coronavirus disease (COVID-19)	Cross-sectional	Radiology staff	Interventions suggested by this study are as follows: Picking people with good psychological quality and strong decision-making to share their psychological experience, involving medical staff-daily life training, reducing sensitivity perception of stress, collecting valuable positive information and providing timely notification to staff
Mills, Australia, 2020	Resilience: What COVID-19 is reminding us about self-care and staff support	Report	Nurses	Interventions suggested by this study are as follows: Provide and use equipment, individual self-care plans, staff support initiatives, and innovative models of compassionate. Using collaborative care
Halcomb, Australia, 2020	The support needs of Australian primary health care nurses during the COVID-19 pandemic	Online cross-sectional	Nurses	Interventions suggested by this study are as follows: To clear protocols about the appropriate use of personal protective equipment, to provide equipment and its consistency, to provide protocols to govern clinical care, making information up-to-date regularly, to access to education for both health professionals and community, funding, improving self-care culture and valuing nurses (voiceless/ autonomy)

(continued)

Table 2. (continued)

Author, year, country	Title	Study design	Participants	Intervention
Lai, China, 2020	Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019	Cross-sectional	HCW	Interventions suggested by this study are as follows: Providing leisure activities such as yoga, meditation, and exercise, and motivational sessions, providing a place to rest and sleep, providing adequate breaks and time offs, providing online platforms for medical assistance, establishing shift systems in hospitals, availability of helpline and psychological counseling
Owens, India, 2020	Supporting nurses' mental health during the pandemic	Report	Nurses	Interventions suggested by this study are as follows: To provide education (frontline staff, mental hygiene, end of life care), to designate non nursing staff to facilitate communication between family and patients, to provide accessible mental services to all, to offer financial counseling or support for assistance, to implement mechanisms to assess the mental wellness of staff in real time, to increase communication and to establish a hotline staff
Garrett, USA, 2009	Mitigating absenteeism in hospital workers during a pandemic	Cross-sectional	Hospital employees	Interventions suggested by this study are as follows: Providing employee alone or employee and immediate family members with necessary PPE and antiviral therapy (prophylaxis and treatment), which was the most effective; supporting employee by providing care for dependents both child and adult (least effective probably due to lack of confidence in provider's ability to provide the same quality of care) and also for pets; providing employee with transportation service to avoid contact with public
Billings, UK, 2020	Supporting hospital staff during COVID-19: Early interventions	Letter	Hospital staff	Use of early psychological interventions as support of coping process, foster resilience, reduce burnout, and reduce the risk of developing mental health difficulties. Providing staff with basic physical needs as safety (appropriate access to personal protective equipment), food and hydration, rest, and sleep. Support staff to take breaks and attend to self-care. Role modeling by senior staff provide high-quality communication and accurate information updates to all staff implement flexible schedules for workers and rotate workers from higher-stress to lower-stress functions provide training not only on the clinical skills required to deal with COVID-19, but also on the potentially psychological effects of work respond to staff feedback, valuing staffs work and providing needed support for more vulnerable
Greenberg, West Africa, 2015	Potential mental health consequences for workers in the ebola regions of west africa - a lesson for all challenging environments	Report	HCW	Interventions suggested by this study are as follows: Providing preventive care of medical staff at risk of psychological damage, detecting the most vulnerable staff and treating staff facing psychological problems
Adams, USA, 2018	Facilitating partnerships with community- and faith-based organizations for disaster preparedness and response: Results of a national survey of public health departments	Cross-sectional	Community health workers	This study focused on interventions based on partnership between CFBO and hospitals for disaster preparedness, it suggests resource sharing with and communication and outreach to community faith-based organizations. It also suggests that positive relationship between a health care organization and community's faith-based organizations positively affects the s interorganizational trust

Interventions

According to the Human Resources for Health Action Framework, interventions from 21 studies were categorized into five main themes, including Leadership, Policy, Partnership, Finance and Education. The most and least interventions were financial and partnership, respectively.

Theme 1- Financial Intervention and Strategies

Lack of personal protective equipment is reported to be a major problem affecting the sense of personal safety and as a result, decreasing workers' willingness.¹⁹ Inadequate supply of personal protective equipment was reported as a problem during previous pandemics and epidemics.^{20,21} Without adequate physical protection, the perceived risk of employees' contagion increases and this will affect the staff's willingness to work. A study showed that protecting staff and their immediate family with PPE and antiviral therapy is expected to have the most effect on mitigating absenteeism.²² Additionally, studies suggested training plans to meet the efficient usage of equipment.^{7,9,23-25}

Some studies consider direct financial supports like an increase in wages to be ineffective in complex disasters.²⁶ However, indirect financial supports like childcare and elderly care services, special restrooms for frontline workers, free screening and treatment are reported to be effective. As family safety was a prominent factor in these findings, a greater amount of likeliness to work will occur when antiviral medication or vaccine is provided to both the nurses and their family.²⁷⁻²⁹

Theme 2- Organizational Policies

Psychological support, information, working environment, and employee assessment are its principal subthemes. These decrease cadres' burnout, mental distress, and absenteeism.³⁰ Interventions involving psychological support can be divided into prevention, screening, and treatment strategies.²⁶ All interventions are considered at three levels: individuals, units, and organizational.

Most articles focused on prevention using planned meetings with psychologists for at-risk workers at individual level and group talks and sharing motivated workers' experiences at the unit level. General psychological workshops are also suggested at the organizational level.^{20,23,31,32}

There is also a significant amount of attention to screening programs especially the ones on the online platform.³³ Treatment strategies were not suggested as primary forms of intervention; however, free treatment services for workers and their family were suggested.³⁴

Information is considered in collection and function dimensions. Data collection is the primary step in all HRM functions. To have effective policymaking, data of risk factors

affecting the staff and what they need should be gathered.³ They should also create ways to become aware of evidence-based and innovative solutions.⁸

Employees need clear, regular, and up to date information about the disease, mortality rate, and the supply of equipment. It is vital to create a trustworthy climate of situational awareness in hospitals and administrators are responsible to increase the data quality.^{26,35}

There is a significant gap in knowledge on this subtheme. Although articles mentioned the importance of this factor, few interventions have been implemented in this area. Studies on working environment interventions suggested establishing hotline staff, using nonprofessionals as supportive patient care and to provide longer work hours especially during wars.^{25,26,36} The assessment of current, future, and quarantined workers seems necessary.²⁶ To keep in touch with quarantined workers and not to leave them alone, improve their sense of worth. Predeployment assessments help recognize those volunteers with psychological and physical risk factors.³²

Theme 3- Educational Intervention and Strategies

This theme is based on studies that focused on education and training, considering three subthemes:

1. **Professional knowledge of diseases and care protocols:** When cause of the disaster is the spread of a new disease, the importance of updating scientific and professional knowledge increases significantly. Professional knowledge can be increased through a wide range of interventions, from changes in curricula preparing students^{24,37} to special workshops, seminars, and lectures for hospital workers focused on special care for disease.²⁴ It can also include managerial workshops for administrators.⁸ Lack of education was reported as one of the important factors causing hesitation to respond among nurses^{7,38,39} and researches proved the positive effect of educational interventions on willingness. Online training is also suggested to save time and make training easier.²⁰ There is also a pre-deployment plan of training for those workers recruited in time of disaster or those whose tasks were changed to cover the extra workload.^{32,40}
2. **Knowledge of mental conditions:** Studies highlighted the fact that the more employees are aware of mental distress during disasters and self-protection plans against stress factors, the less they face mental disorders. This awareness increases in various ways. Workshops for controlling stress, improving problem-solving and decision-making skills are the examples of this interventional subtheme.
3. **Self-care as the result of culture building and education:** Studies confirmed the positive impacts of personal-care actions like physical activity, adequate

sleep, efficient use of PPE, self-assessment, and self-report on HCWs willingness to work in emergencies.⁸

Theme 4 – Leadership

As stated in several articles the sense of being valued by the organization, authority in work as a professional and the possibility of expressing ideas, suggestions, and bringing conflicts to the leaders are the main willingness factors that can be discussed in this theme.^{3,20,26,41,42} Direct communication between managers and workers and frequent visits of units involved with disaster are recommended.²⁵ This theme is ignored by administrators despite its cost-efficiency. There is a need for more evidence and interventions to prove its effectiveness.⁴³

Theme 5 – Partnership

It mainly discussed communications. Inviting qualified, motivated, and successful cadres to exemplify, social and professional championship for frontline workers, and using battle buddy strategy are major interventions considered in this theme. The “Battle Buddy” strategy provides consistent psychological and professional support in an uncertain and stressful working environment.⁸ Another suggestion has brought on by the articles focused on this theme was cooperation with community faith-based organizations that supported the sharing of knowledge and resources.⁴⁴

There is a narrow border between these themes. Some interventions can be placed in several themes. There is no clear quantitative data on interventions efficacy and effectiveness since most studies did not assess the outcomes. Besides, lack of attention to the ethical and legal condition of workers’ willingness in disasters is recognized which needs more researches in the future.

Our study is unique considering both factors affected willingness and interventions to improve it.^{45–49} This approach makes more comprehensive vision for researchers in analyzing data. In addition, we used common intervention themes with the HRH framework of the world health organization (WHO). The results of the included studies are summarized in [Table 2](#) as a supplementary file (Appendix A,B).

Factors Affect Willingness to Work

Thirty one articles discussed factors that affect human resource willingness to work in disaster condition. Researcher categorized these factors into demographic factors (4 subtheme), working environment (1 subtheme), employees’ self-condition (7 subthemes) and organizational factors (5 subtheme) in order to comprehend the relation of these factors’ themes and intervention’ themes better ([Table 3](#)). Characteristics of included studies that considered factors associated with health care workers’ willingness presented to [Table 4](#) in the supplementary file.

Gaps in Research

This study found a significant ignorance of partnership as interventions and themes were discussed only in the health care system while willingness and hesitation factors caused by disasters were also connected with other aspects of workers’ life.^{50,51} This study suggests more researches to be conducted on organization policies, leadership and partnership themes and interdepartmental cooperation ([Figure 6](#))

Discussion

This study focused on determining strategies and interventions implemented to increase the resiliency and willingness to work



Figure 5. Countries included in the study.

Table 3. Characteristics of factors affect willingness to work (N = 31).

Theme	Subtheme	Interventional Suggestion Theme
Demographic	Age Gender Personal sense of Religion Patriotism Duty/role	To consider related demographic factors in recruitments during disaster
Working environment	Basic health status Workload	Financial and policy
Employees' self-condition	Fear of contagion Knowledge Social skills Self-efficacy Profession Working years Support needs	Partnership, leadership, education and financial
	Self Family General Specific to pandemic Sense of value Communication	
Organizational	Safety climate Data validity Policies Financial support Confidence on employees	Policy, leadership and financial

in HCWs during complex disasters. At the time of writing, many countries throughout the world are struggling with the COVID-19 pandemic affecting all aspects of the health system functions and decreasing the workforce's willingness to work.

It defines five major areas of action based on intervention types of 52 articles involved in our study and the WHO framework of HRM.¹⁸ Although there are demographic factors like gender and age that affect employee's willingness to work, this study does not discuss them because these factors are not changeable for current workers.⁵²⁻⁵⁵ These factors are considered while recruiting workers in a time of disaster or while changing workers' tasks to cover the extra workload.

Managers need to guarantee a sense of safety and health for health care workers and their families. Evidence shows that simply providing adequate personal protective equipment for workers increases their willingness to work. A related but less expensive option is to offer nurses scrubs and a place to shower before returning home.²⁷

Knowledge of the disease and self-care are also powerful tools. They increase both the nurse's ability to feel safe when caring for patients and the likelihood that effective infection control measures will be followed.

The need for ongoing education is essential as more data becomes available both on disease and on ways of protection against it. Staying informed of official recommendations for care of the patient require frequent and continuous updates for staff. Nashwan et al also suggested some remunerative models for nurses based on knowledge and attitude.⁵⁶

Another important aspect to consider is the workplace atmosphere. Evidence shows that communications are

highly correlated with mental health; and the resilience of a team may be more related to the bonds between team members than the coping style of any individual. Peer relationships with colleagues provide opportunities for staff to talk about their experience to enhance support and social cohesion. These sessions should not involve anyone being forced to talk about his or her thoughts or feelings. These sessions should be provided during a staff member's shift (not afterward) so as not to encroach on rest and recovery time. These findings are supported by those of the other studies during Ebola⁵⁷ and MERS outbreaks.⁵⁸

The social stigma was another theme, which is in line with the MERS-COV outbreak, indicating that both stigma and hardiness exert direct effects on the nurses' mental health.⁵⁹ It is suggested that the nurses' experiences in these epidemics are to be transferred to a section of nursing textbooks and taught in nursing schools. These experiences can provide an acceptable guideline for nurses all around the world to deal with the epidemics more effectively as it is also a valuable experience for nursing and hospital managers. Further training of psychological skills among medical staff is also recommended.³⁸

Finally, recent studies include that increasing nurses' knowledge about pandemics, paying attention to their financial benefits, and especially focusing on their perceived value are the most important willingness strategies in COVID-19 pandemic.⁶⁰

These implications were not intended to be an exhaustive list of recommendations but are intended to inform planners, managers, and leaders that are likely to be helpful in supporting staff during the COVID-19 pandemic.

Table 4. Characteristics of included studies considering factors associated with health care workers' willingness.

Author, year, country	Title	Study design	Participants	Factors
Von Gottberg, Germany, 2016	The analysis of factors affecting municipal employees' willingness to report to work during an influenza pandemic by means of the extended parallel process model (EPPM) (BMC public health)	Cross-sectional	HCW	Perceived danger of pandemic, perceived personal risk, role importance, role competence, self-efficacy, and sense of duty
Ogedegbe, USA, 2012	Health care workers and disaster preparedness: Barriers to and facilitators of willingness to respond	Cross-sectional	Hospital workers	Caring for their children, caring for elderly, alternative or second job, gender and clinical/non clinical staff the most common barriers included: Caring for children, and caring for pets. (Specially for clinical staff) older age was a significant facilitator of WTR. Hospital's ability to protect safety and provide PPE
Kaiser, USA, 2009	Perspectives of future physicians on disaster medicine and public health preparedness: Challenges of building a capable and sustainable auxiliary medical workforce	Cross-sectional	Medical students	Education and training in disaster medicine and public health preparedness, equipping medical students with knowledge, skills, direction, and linkages with volunteer organizations
Yonge, Canada, 2020	Willingness of university nursing students to volunteer during a pandemic	Cross-sectional	Nursing students	Education, incorporating emergency response teaching, PPE
Tippett, Australia, 2009	Anticipated behaviors of emergency prehospital medical care providers during an influenza pandemic	Cross-sectional	HCW	Education and training, colleagues exposed or potentially exposed to influenza), confidence in their employer, concern for safety of family members, perceived risk of infection, peer behavior, sense of duty, child or eldercare obligations
Shapira, Israel, 1991	Willingness of staff to report to their hospital duties following an unconventional missile attack: A state-wide survey	Cross-sectional	HCW	Age of youngest child, number of children residing in household, profession
Qureshi, USA, 2005	Health care workers' ability and willingness to report to duty during catastrophic disasters	Cross-sectional	HCW	Personal Obligations (childcare)- Availability for additional Shifts (reported yes)-Personal safety
Al-Hunaishi, Yemen, 2019	Factors associated with health care workers willingness to participate in disasters: a cross-sectional study in Sana'a, Yemen	Cross-sectional study	Nurses and doctors	Self-efficacy, being young, male and having higher educational qualifications
Ben Natan, Israel, 2015	Willingness of future nursing workforce to report for duty during an avian influenza pandemic	Cross-sectional	Future nurses	Perceived self-efficacy, financial incentives, protection, transportation
Kang, China, 2020	Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study	Cross-sectional	Doctors and nurses	Access to psychological materials (such as books on mental health), access to psychological resources available through media (such as online push messages on mental health self-help coping methods), and participation in counseling or psychotherapy

(continued)

Table 4. (continued)

Author, year, country	Title	Study design	Participants	Factors
Drevin, Sierra Leone, 2019	For this one, let me take the “ risk”: Why surgical staff continued to perform caesarean sections during the 2014–2016 Ebola epidemic in Sierra Leone	Qualitative study	Surgical staff	Clinical adaptability and overcoming the moral dilemmas
Gan, China, 2020	Willingness of Chinese nurses to practice in hubei combating the coronavirus disease 2019 epidemic: A cross-sectional study	Cross-sectional study	Nurses	Younger, unmarried, members of the Communist Party of China, with senior professional qualification, working in critical care departments, with support from their families, with adequate training and learning, with good health status and low levels of anxiety
Gao, Australia, 2017	Challenge-related stress and felt challenge: Predictors of turnover and psychological health in aged care nurses	E-cohort study	Aged care nurse	Stress
Gee, West Africa, 2017	The role of risk perception in willingness to respond to the 2014-2016 west african ebola outbreak: a Qualitative study of international health care workers	Qualitative study	HCW	Risk perception
Ben Natan, Israel, 2014	Nurse willingness to report for work in the event of an earthquake in Israel	Cross-sectional	Nurses	Perceived self-efficacy, level of knowledge, experience and the support of a multidisciplinary staff
Thormar, Indonesia, 2016	PTSD symptom trajectories in disaster volunteers: The role of self-efficacy, social acknowledgement, and tasks carried out	Cross-sectional	Red cross forces	Having sought prior mental help, reported lower levels of self-efficacy and social acknowledgement, and were more likely to have provided psychosocial support to beneficiaries
Burke, USA, 2011	Factors associated with willingness to respond to a disaster: A study of health care workers in a tertiary setting	Cross-sectional	Hospital workers	Demographics, employment, disaster-related training, personal preparedness, and necessary resources
Charney, USA, 2015	Hospital employee willingness to work during earthquakes vs pandemics	Cross-sectional study	Hospital workers	Pandemic willingness to work were as follows: No children ≤3 years of age, older children, working full-time, less concern for family, less fear of job loss, vaccine availability. Earthquake willingness factors included: Not having children with special needs and not working a different role. Improving care for dependent family members, worker protection, cross training, and job importance education
Connor, USA, 2014	Factors associated with the intention of health care personnel to respond to a disaster	Cross-sectional	HCW	Normative and control factors (normative and control factors can be bolstered through education by focusing on team building and knowledge related to accessing supplies and support needed to respond when a disaster occurs)

(continued)

Table 4. (continued)

Author, year, country	Title	Study design	Participants	Factors
Draper, UK, 2008	Health care workers' attitudes towards working during pandemic influenza	Multi method study (qualitative and questionnaire survey phase)	HCW	Socio-demographic factors (e.g., age, gender, country of birth), category of HCW (occupational group, tenure, or length of service with, line manager or nonline manager, full time or part time, shift worker or nonshift worker), knowledge of pandemic influenza, home circumstances (e.g., care to children/parents), distance from home to work, perceived risks and benefits of continuing to work, likelihood of continuing to work in different circumstances, agreement/disagreement with statements of various ethical principles
Errett, USA, 2015	Attitudinal determinants of local public health workers' participation in hurricane sandy recovery activities	Cross-sectional	Hospital workers	Training, safety, family preparedness, policies and planning, and efficacy
Goodhue, USA, 2011	Willingness to respond in a disaster: A pediatric nurse practitioner national survey	Cross-sectional	Pediatric nurse practitioners	Demographics, personal preparedness plans, disaster training, prior disaster experience, and likelihood of responding in the event of a disaster
Tebuegge, Australia, 2009	Perception, attitudes and knowledge regarding the 2009 swine-origin influenza a (H1N1) virus pandemic among health care workers in Australia	Cross-sectional	HCW	Access to antiviral treatment, access to antiviral prophylaxis, preparedness to work in pandemic situation, overestimating the mortality risk
Y.F. Guo, China, 2017	Exploring resilience in Chinese nurses: a cross-sectional study	Cross-sectional	Nurses	High level of self-efficacy and education, as well as having a positive coping style and choosing a healthy lifestyle
Errett, USA, 2013	Assessment of medical reserve corps volunteers' emergency response willingness using a threat- and efficacy-based model	Cross-sectional	Medical reserve corps volunteers	Self-efficacy
Garrett, USA, 2009	Mitigating absenteeism in hospital workers during a pandemic. Disaster medicine and public health preparedness	Cross-sectional	Hospital workers	Safety concerns, dependent care, transportation, mitigation strategies (included preferential access to antiviral medication or personal protective equipment for the employee as well as their immediate family)
Gershon, USA, 2010	Factors associated with the ability and willingness of essential workers to report to duty during a pandemic	Cross-sectional	Hospital workers	Organizational (safety climate trust-planning), Individual (demographic/pandemic variable-vaccine-protection-risk)
Kagan, Israel, 2017	Patriotism, organizational commitment and nurses' intention to report for work in emergencies	Cross-sectional	Nurses	Patriotism commitment
Imai, Japan, 2009	Factors associated with motivation and hesitation to work among health professionals during a public crisis	Cross-sectional	HCW	Protection, ethical, high workload, not be ignored, increase knowledge, burden the increase in workload, conflict

(continued)

Table 4. (continued)

Author, year, country	Title	Study design	Participants	Factors
Liang, China, 2020	Beyond disaster preparedness: Building a resilience-oriented workforce for the future	Cross-sectional	HCW	Organizational changes, training, leadership
L.Huang, China, 2020	Factors associated with resilience among medical staff in radiology departments during the outbreak of 2019 novel coronavirus disease (COVID-19)	Cross-sectional	Radiology staff	Lack of knowledge-less confidences and fear of high contagious -family concerns knowledge/availability of protective measures, perceived stress Halcomb
Halcomb, Australia, 2020	The support needs of Australian primary health care nurses during the COVID-19 pandemic	Online cross-sectional	Nurses	Support need: protection, communication, funding, psychological support, valuing nurses (voiceless/autonomy), workplace condition, self-care
Yumiko Aoyagi, UK, 2009	Health care workers' willingness to work during an influenza pandemic: a systematic review and metaanalysis	Systematic review	HCW	Sex (female/Male), clinical/nonclinical, location (urban/Rural), employment (full/Part), childcare, personal safety, protective measures, risk perception, training, general knowledge, role importance, role knowledge, confidence in skills, preexperience, confidence in employer, communication skills, family preparedness, job type (Doctor/Nurse/Other)

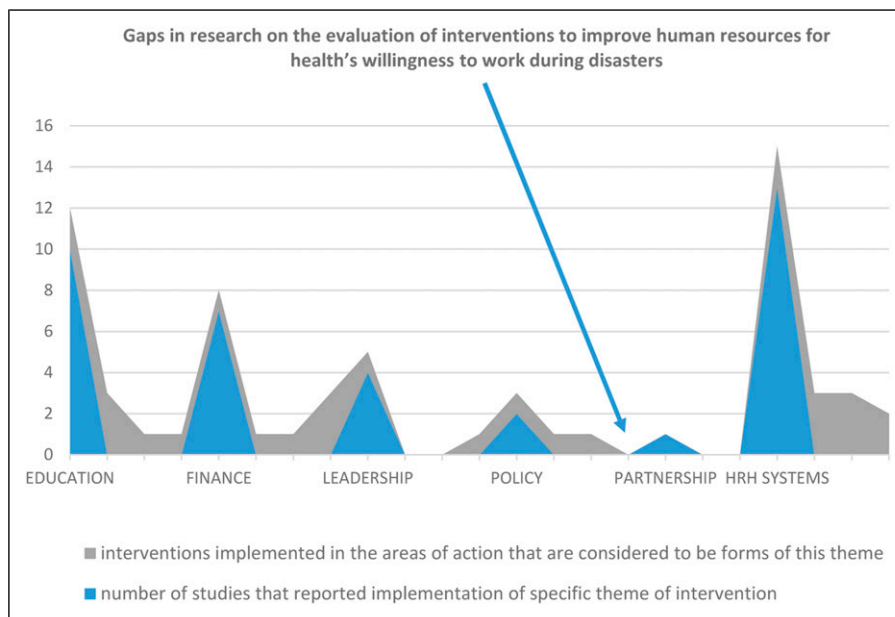


Figure 6. Gaps in knowledge.

Limitations

Since the purpose of this review was to understand findings and trends in the published literature, the major limitation of the study is that gray literature was not reviewed, whereas

gray literature covers a wide array of information relevant to a willingness to work such as policy, action plans, and reports. Second, the search was limited to those published papers in the English language. Third, the search was done in three main databases; thus, it is possible that some studies were lost

if they were indexed exception PubMed, Scopus, and WOS. Finally, these interventions are quite various in different organizational cultures in different regions and countries, and because of time and source limitations, these cultural differences were not considered in this study.

Conclusion

The studies included in this review show a wide range of approaches on how to address intervention improve willingness to work in conditions like a disaster. While most respondents reported their willingness to work during this pandemic, it is anticipated that as the severity of an event increases, willingness and ability to work will decrease. This study demonstrated a distinct decrease in the willingness to work as PPE available for workforce diminished and when they considered their immediate family at risk of illness or death. The findings revealed a strong perception that the “Battle Buddy” system should be implemented to increase the resilience of frontline workers. This research also demonstrated the important role that the safety of a worker’s family plays in the HCWs’ willingness and performance. Managers can potentially increase the commitment and likelihood of HCWs caring for patients through interventions focusing on maintaining the safety of both the employees and their families. If organizations were to implement these strategies and interventions, they should let the staff know these decisions and as a necessary step in every organizational intervention remember to evaluate the impacts.

Appendix A

Abbreviations

HCW	Health Care Worker
WHO	World Health Organization
PRISMA	Preferred reporting items for systematic reviews and metaanalyses
MeSH	Medical Subject Headings
HRH	Human Resources for Health
PPE	Personal Protection Equipment
WOS	Web of Science
MERS	Middle East Respiratory Syndrome
COVID-19	Coronavirus disease 2019

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Author Contributions

NKD, AFA, MRL, SS, and SG had the main idea for the study.

All authors devised the search strategy and eligibility criteria. SS conducted the database search strategies, MRL, AFA, and NKD conducted the exclusion of studies and the eligibility assessment of the full-text articles, extracted data and drafted the synthesis of results.

AFA and NKD drafted the initial study, and SG provided critical revision of study.

All authors approved the final study.

Declaration of Conflicting Interests

The authors declare that they have no competing interests.

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