IDENTIFICATION OF FACTORS ASSOCIATED WITH PUBLIC HEALTH WORKFORCE RESILIENCE

ABSTRACT

The purpose is to identify the resilience factors of public health workers. During disasters, public health workers play a critical role in protecting public health. When not managed effectively, poor performance and thus inferior public health could be observed due to high levels of stress or elevated adversity in the workplace. To understand the influencing factors of public health worker resilience, we conducted a comprehensive and systematic literature review. This paper reports the resilience factors, categorizes whether they are individual characteristics or external environmental factors and suggests the corresponding interventions that could enhance the resilience of the public health workforce.

Keywords: Resilience factor; public health worker; stress; disasters; and workforce resilience.

INTRODUCTION

Resilience refers to the outcomes and processes of achieving positive adaptation in the presence of stress or adversity (Fullerton et al. 2021). The public is facing an unprecedentedly uncertain ecological environment, in which the number of unexpected events is increasing, such as the Indian Ocean tsunami in 2004, the Chilean earthquake in 2010, and the recent pandemic caused by a novel coronavirus first discovered in 2019 (COVID-19) and its variants. Natural disasters, pandemic diseases, terrorist attacks, political unrest, economic instability, and the Ukraine war in 2022 have unpredictable effects on public health and sustainability. During such situations, public health workers promote, protect, and improve the health of the people and communities. They are frequently involved in such situations to save lives and prevent unfavorable situations for the vulnerable population (Benedek et al. 2007). During those situations, some individual workers are not as affected by workplace stress and thus display fewer negative or even positive outcomes. Such individuals are referred to as being "resilient". There might exist both internal and external factors that give public health workers the ability to positively adapt to stressful and traumatizing situations. The perspective of resilience offers a theoretical framework for exploring and understanding how workers are exposed to risk and react accordingly. The perspective of the public health workers towards resilience to stress and the factors that contribute to the adjustment are important because public health workers play a key role in the lives of people and society through direct care services and integrative work.

Different external factors might exist for different cultures and environments. For example, in some organizational cultures, innovation and openness are key resilience factors (McAllister et al. 2009). In such environments, while these factors are identified outside public health, we might be able to introduce some of those factors to the context of public health workforce. To build a resilience-oriented workforce, online education and training programs are essential. However, to develop effective programs, understanding both external and internal resilience factors is necessary. Internal factors include flexibility, adaptability, understanding the changes of the working environment, and increments the adjustments to disturbances, among others etc. (Nelson et al. 2007).

The objective of this paper is to identify all the factors associated with resilience in public health workers through a comprehensive literature review some interventions based on those factors. The rest of the paper is organized as follows: First, we present the research questions of interest in this paper. Second, we review

the literature to provide some background information. Third, we explain our methodology in detail. Fourth, in the results section, we list and explain internal and external resilience factors for public health workforce and suggest targeted interventions based on those factors. Finally, we draw some conclusions and provide future research directions.

RESEARCH QUESTIONS

Due to the increase in frequency and intensity of natural and man-made disasters, more people are faced with difficult situations. To reduce human suffering, public health workers play a critical role in those situations. Many public health workers must continuously work in stressful situations for a long time each day (Liu et al. 2020). In such an environment, the workers are affected by stress and possibly traumatic experience severely; however, some of the workers are less affected by those stresses and are called resilient workers. The source of resilience could be the work environment. For example, when peers are encouraging in the work environment, public health workers might become less affected by the work stress in that workplace. The following research questions are addressed in this paper: What are the internal and external factors that increase the resilience of public health workers? What targeted interventions could be used based on those identified factors?

LITERATURE REVIEW

Importance of Resilience in the Public Health Workforce

A survey was conducted in the United States and showed that public health workers' intentions to leave work had increased between 2014 and 2021 due to the pandemic where they experienced a high level of stress due to work overload and burnout (Jackson et al. 2022). During a pandemic, where they might have to complete more tasks, some public health workers might lack time for their own personal health care and other needs. As a result, health issues and burnout due to stress might be observed among health workers. Even public health officials, who hold leadership positions, resigned due to work overload, critical examination, and pressures over their rights (Jackson et al. 2022). Research in the U.S. shows that there is a positive association between mental and physical health and resilience (Fullerton et al. 2021). Due to these issues, it became critical to manage the stress of public health workers through different strategies and make them resilient (Jackson et al. 2022). To understand the reason behind the decline of the public health workforce in the United States by 20%, the U.S. government conducted a survey of public health professionals to assess their risks and protective factors and health conditions which were shared through health departments and social media. A diverse group of health workers of different genders, ages, and races participated in the survey. They experienced different negative outcomes including depression, anxiety, poor health, and burnout (Stone et al. 2021). There is a need to increase resilience among the workers to safeguard their health physically and mentally. Initiatives and actions must be taken to strengthen their capacities by providing valuable and relevant information and increasing their engagement with others (Stone et al. 2021).

Characteristics of Resilient Workers

Resilient people typically have such characteristics as an internal sense of control, pro-social behaviors, empathy, a good self-image, optimism, the capacity to plan out daily tasks, neuroticism, coping style, and mindfulness, all of which enhance resilience in the workplace (Friborg et al. 2003). These characteristics help people create enduring bonds with friends and family that they can rely on throughout difficult times. Additionally, resilient people seem to be better at adapting to changes than sensitive individuals. Resilient people could successfully overcome difficulties using protective resources (Friborg et al. 2003). Resilient

workers self-assess themselves to identify their weaknesses and strengths and make themselves resilient by identifying the manners that resilience will empower the workers during adverse situations (Siebert 2005).

Enhancing Resilience in Public Health Workers

Public health workers must be educated and trained in certain fields such as law, communication, global health, policy, ethics, etc. (Tilson et al. 2004). Mainly public health workers have been employed by the public health systems. Several rigorous steps behind the improvement of the public health workforce involve recruitment, training, and employment. There are national certification programs that increase the competency of workers (Tilson et al. 2004). There are resilience-developing activities, which increase the speed and depth of resiliency development. There are five levels of resilience, where at each level different qualities are developed such as emotional stability, flexible complexity, coping skills, and problem-solving skills (Siebert 2005). World Health Organization (WHO) and governments also focus on the training and development of the public health workforce through activities, training programs, and strategies such as management in working time and enhancement of health, and institution safety of public health workers (World Health Organization 2022). It is the goal of this study to contribute in developing effective resilience training programs for public health workers by targeting internal and external factors critical for resilience.

METHODOLOGY

We conducted a comprehensive literature review to identify the resilience factors for public health workers. To find all the relevant studies, we used the key term of "public health workforce resilient factors" and "public health workforce resilience factors" to search in such major databases as Google Scholar, PubMed, Science Direct, Sage Pub, and Springer Link. After using all these search terms in databases, we found 10,810 search results with the key term of "public health resilient factors", and 32,989 search results with the key term of "public health resilience factors". Then, we set inclusion and exclusion criteria to remove some papers, which do not meet these criteria after the searches. The inclusion criteria are 1) being related to the public health workforce, 2) publishing year is between 1973 and 2021 (most of the articles are available between these periods in the databases), 3) papers related to identifying the interventions of resilience factors for only public health workforce, 4) peer-reviewed papers, and 5) being published in English. And the exclusion criteria are 1) being duplicate papers, 2) from grey literature such as newspaper articles, 3) being related to organizations, nurses, and health disciplines, and 5) academic and professional books. Then, the first author manually screens the titles and abstracts if appropriate to exclude irrelevant papers.

Table 1 Search results with the two key terms in Google Scholar, PubMed, Springer Link, Science Direct and Sage Pub.

Database Name (Publication Year)	Search Results for "Public Health Workforce Resilient Factors"	Search Results for "Public Health Workforce Resilience Factors"
Google Scholar (1973-2021)	20,400	20,400
PubMed (1984-2021)	154 (1992-2021)	371 (1984-2021)
Springer Link (1979-2021)	7,699	7,832
Science Direct (1973-2021)	2,950	4,379

Sage Pub	7 professional and academic books	7 professional and academic books

Since only professional and academic books are identified from Sage Pub, we excluded Sage Pub. For Google Scholar, both key terms yield the same search results, which consist of 20,400 papers, among which 5,100 papers are not between the period of 1973-2021 and remaining 15,302 are not relevant to the resilience of public health workers. For the key term of "public health workforce resilient factors", a total of 2,950 papers are found in Science Direct. A total of 1,561 papers meet exclusion criteria, which are professional books or not within the period, and the remaining 1,383 papers are not relevant. For Pub Med, the search results in 154 papers. A total of 8 papers are excluded, which includes reports, editorials, encyclopedias, and the remaining 141 papers are not related to public health workers. In Springer Link, the search results in 7,699 papers, among which 6,565 are not within the period, and the remaining 1,131 papers are not relevant. For the key term of "Public health workforce resilience factors", a total of 371 papers are found in Pub Med, a total of 33 of which were excluded since they are not in English and/or books, and the remaining 338 papers are not relevant to public health. In Springer Link, a total of 7,832 papers are found. A total of 5,067 papers do not meet inclusion criteria, and some of them are not published in English and the remaining 2,765 papers are not related to public health workers. In Science Direct, a total of 4,379 papers are found and a total of 2,319 are books, records and/or not within the period and the remaining 2,054 papers are not relevant. Table1 lists the numbers of search results in the electronic databases for the two key terms. Figure1 shows the flow of methodology.

Figure -1 Research Framework

Scoping
- Identify the key terms related to the research
- Determine the exclusion and inclusion criteria

Searching
- Identify the relevant studies using key terms in such electronic databases as Google scholar, PubMed, Science Direct, Sage Pub and Springer link

Screening
- Title and abstarct screening to identify the relevant studies
- Apply the exclusion and inclusion criteria

In-depth Analysis
- Identify the resilience factors for the public health workers from the relevant studies.
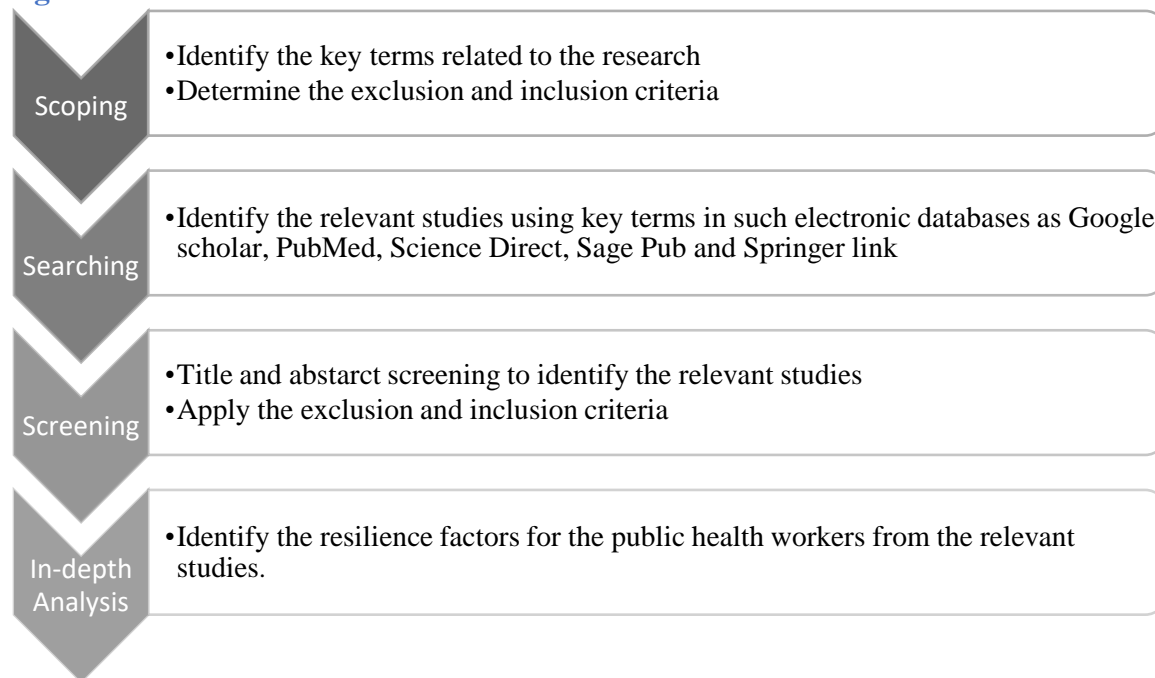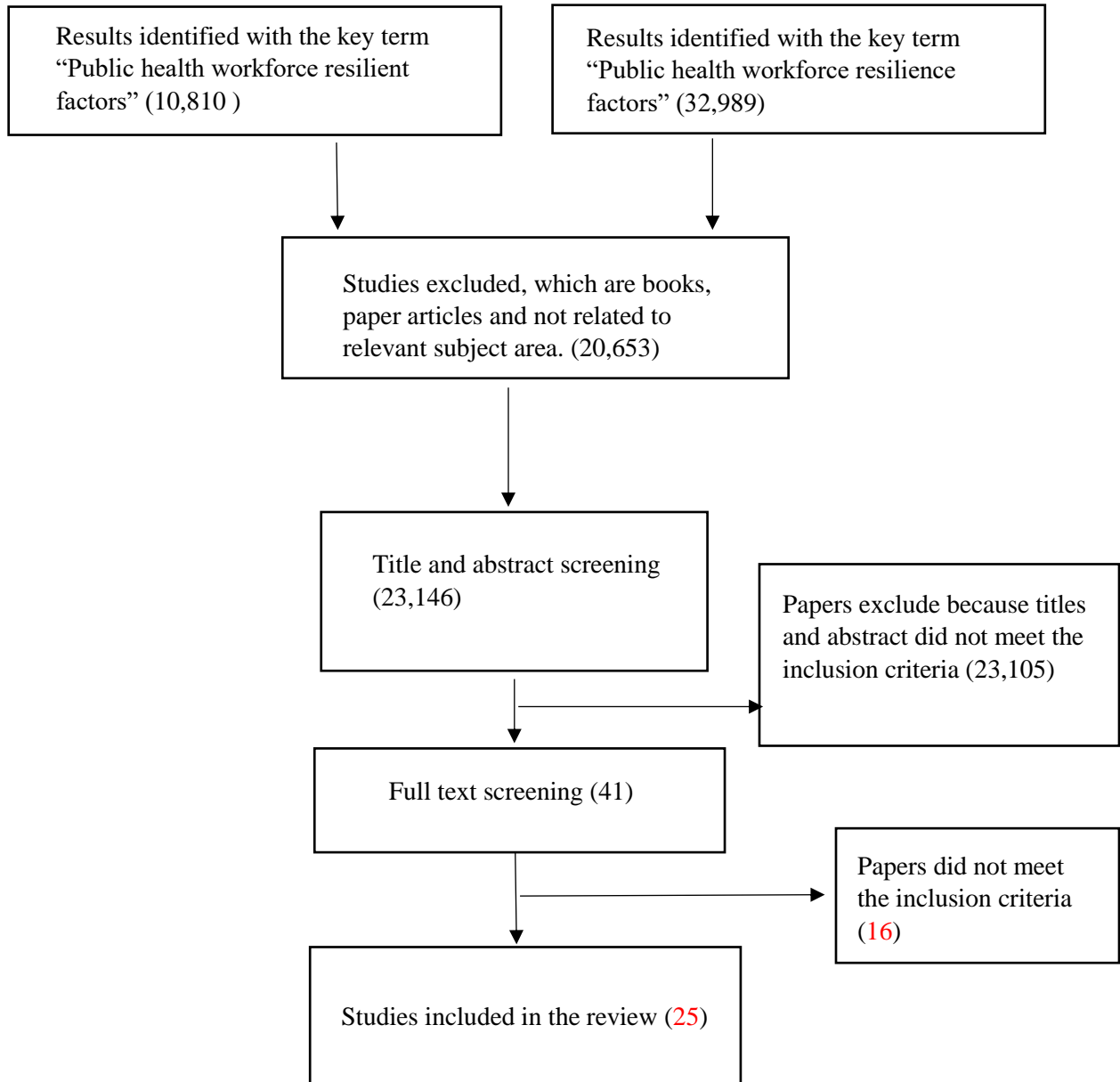
Figure 2 shows the process of identifying the papers for review. After identifying the relevant studies, we analyze them in depth to identify the factors that help to develop the resilience of the public health

workforce. It might be internal, which is an individual characteristic to develop resilience, or external, which supports the development of resilience in the workforce for the public health workers.

Figure 2 Flowchart of Paper Screening Procedure.

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┌─────────────────────────────┐     ┌─────────────────────────────┐
│ Results identified with the │     │ Results identified with the │
│ key term "Public health     │     │ key term "Public health     │
│ workforce resilient         │     │ workforce resilience        │
│ factors" (10,810 )          │     │ factors" (32,989)           │
└─────────────────────────────┘     └─────────────────────────────┘
                │                                   │
                ▼                                   ▼
        ┌───────────────────────────────────────┐
        │ Studies excluded, which are books,    │
        │ paper articles and not related to     │
        │ relevant subject area. (20,653)       │
        └───────────────────────────────────────┘
                            │
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        ┌───────────────────────┐     ┌─────────────────────────────┐
        │ Title and abstract    │     │ Papers exclude because      │
        │ screening             │────▶│ titles and abstract did not │
        │ (23,146)              │     │ meet the inclusion criteria │
        └───────────────────────┘     │ (23,105)                    │
                    │                  └─────────────────────────────┘
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        ┌───────────────────────┐     ┌─────────────────────────┐
        │ Full text screening   │     │ Papers did not meet     │
        │ (41)                  │────▶│ the inclusion criteria  │
        └───────────────────────┘     │ (16)                    │
                    │                  └─────────────────────────┘
                    ▼
        ┌───────────────────────────────┐
        │ Studies included in the       │
        │ review (25)                   │
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RESULTS

Table 1 shows the resilience factors identified in public health workers, organizations, and nursing workers, who serve the public. In addition, Table 1 lists the resilience factors and their sources and categorizes the factors, based on whether they are external (i.e., environmental factors) or internal (i.e.,

individual characteristics or behaviors). It also includes the suggested interventions, which could develop resilience based on the corresponding factors. In addition, Table 1 includes the sources, where those factors are identified.

Table 1 Resilience Factors

Resilience Factors	Category	Intervention	Source
Having programs to address wellness practices	External: It is an outdoor activity that addresses wellness practices.	These programs teach such wellness practices as self-care, and mindfulness, and reinforce the idea for the workers to accept their feelings and thoughts during adverse events, which decreases the stress and burnout feelings. These programs also could be implemented on a daily basis.	[6]
Integration of professional wellness in education	External: It is an education program to increase awareness of wellness.	The public health workforce might not be competent in the best practices of wellness. If this wellness awareness were integrated in the education curriculum during undergraduate and graduate programs, then people might improve their ability to cope with stressors and difficulties.	[6]
Self-care	Internal: It is an internal characteristic of an individual.	It is an individual action to be aware of the risk and be trained for practicing the first aid for mental health, and proper understanding of the policies and practices in completing the overtime work, where all these helps to decrease the burnouts and increase the resilience.	[6]
Mindfulness	Internal: It is an internal practice of an individual.	These are the practices of evaluating themselves through reflection and meditation, that helps to identify their needs and preferences, and develops coping mechanisms and behaviors to stress.	[6]
Having safety programs for health workers	External: These programs increases the awareness of safety by the workers.	These programs promote the safety in the workplace to manage the health and safety with safe working environment and other safety precautions.	[8]
Having resilience-educational programs	External: It is an educational program provided in an organization.	These programs assist individuals and professionals to know their self-identities, professional competence, and clear understanding of the workplace. It also provides knowledge on manners to respect the public opinions.	[15]
Having skill training and professional education programs	External: It is a program to develop the resilience-oriented workers.	This professional education program teach the skills in various fields such as public health preparedness and provides knowledge on decision-making, adapting to needs for their work. These skills helps to make an individual strong to face challenges or difficulties.	[16]

Having computer-based resilience training.	External: It is an external training module to increase the resilience.	This training program provides knowledge with resilience-based modules, including what is resilience, how to develop resilience characteristics, and includes quizzes, self-assessments, and individual's feedback.	[20]
Conducting self-assessment survey in the organization	External: It is an survey that helps to assess individuals and followed by a consultation to increase the resilience.	It gives a brief understanding of the conditions and signs of the stress that individuals are facing and accordingly provide the consultation support to increase the resilience.	[21]
Having primary and secondary prevention programs	External: This program promote the health workers resiliency.	These programs teach the ability to recognize and thus manage the symptoms and psychological conditions caused by stress.	[22]
Having resilience-promoting workshops	External: These are workshops that helps to promote resilience.	These workshops increase the awareness of the importance of resilience and resilient skills, especially for the workers, who are suffering psychologically, to face difficulties or challenges.	[23]
Internal control	Internal: It is an individual practice of an individual.	These are the practices of controlling over their performance for a long period, which helps them benefit mentally and physically to face the stress over a period.	[24]
Communication	External: It is an external strategy to promote the resilience.	These strategies deliver the useful information to the public through different messaging methods and channels, which promotes the actions and behaviors of the public that will be useful to enhance the resilience and receiving the feedbacks from the public, whether the communication is accurate, and it is available in channels or not.	[25]

CONCLUSION

Adverse events such as the COVID-19 pandemic, the Ukraine war, and many other natural disasters have significant impacts on the public health workforce. In this paper, we conducted a comprehensive and systematic literature review to understand the internal and external factors for resilience in public health workforce and suggest some targeted inventions based on those identified factors.

Some public health workers do not adapt well to stress, burnout, and mental disturbances than others. As a result, many public health workers have resigned from their jobs. According to a recent survey, the number of public health workers has drastically decreased (Preston et al. 2022). To build a healthy community, the resilience of public health workers are important. There are different internal and external factors in the literature that are used to enhance the resilience of public health workers in different manners such as the development of training programs, and promoting individual characteristics, etc. These interventions, which was used in any stress and difficulties in the workplace.

This review summarizes the resilience factors and suggests their corresponding interventions that enhances the resilience of public health workers. We found that there exists a number of external factors, which are targeted towards curriculum revision by integrating resilience education, related to creating safe and resilient work places/cultures, or teaching individual coping skills via wellness training and education, and a number of internal factors, which are related to individual resilience characteristics such as self-care and mindfulness. In addition, there exist training programs, workshops and surveys to raise the awareness of the importance of resilience among public health workforces, and thus promote the resilience. In particular, surveys encourage an individual to assess themselves in terms of resilience, and gain a better understanding of their strengths and weakness, and develop strategies to utilize their strengths and minimize their weakness in difficult situations. As a result, they would be more resilient.

In the future, a hierarchical structure based on all the identified factors associated with public health workforce resilience would be created with using Interpretative Structure Model (ISM). To prioritize the factors, Analytic Hierarchy Process (AHP) methodology would be used, which discovers a global preference relationship among several alternatives by conducting pairwise comparisons.

Further some interventions analysis is needed to prioritize and develop the frameworks which could help public health workers better manage interventions for effective and efficient resource allocation in particular conditions to improve resilience in public health workers.

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