

Role of system thinking of nurse leaders in managing crisis: A Review

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Abstract

Background: Effective leadership and a solid grasp of systems thinking are essential for handling crises in the healthcare industry. System thinking helps executives navigate the complexity and unpredictability of healthcare systems.

Aim: This review was conducted to gain an understanding of the literature related to system thinking of nurse leaders and its role in managing crisis.

Methods: This study included a thorough literature review and narrative analysis. For the current study, the search encompassed the following online databases: Google Scholar, Science Direct, PubMed Central, and the Cochrane Library. Data was taken from every article that was taken into consideration, and themes were developed based on this data. **Findings:** A total of 18 studies met the inclusion criteria for this literature review. **Conclusions:** Managing crises in healthcare requires effective leadership and a strong understanding of systems thinking

Relevance to clinical practice: This research has practical applications and focuses on enhancing nurse leaders' crisis management skills through the use of system thinking.

KEYWORDS

Leaders, nurses, crisis management, role, and system thinking

1 | OVERVIEW

Systems thinking is an approach to problem-solving that examines an issue inside its system, as well as surrounding elements that are affected by or related to the problem, and collectively develops a solution that achieves the system's goal (Hamlin, 2021). The ultimate goal of a systems-thinking approach is to create a secure environment where all participants can discover the invisible consequences of their collective actions and question their assumptions. By understanding the entire healthcare system, its components, how they interact, and how to use system resources efficiently, system thinking seeks to provide safe patient care (Dolansky & Mahsoon, 2021).

A crisis occurs when those affected by a disaster encounter intense difficulty and danger' (Al Kurdi, 2021). Furthermore, unexpected, unforeseen incidents that interfere with the regular lives and activities of individuals affected by a disaster can also result in a crisis (Al Kurdi, 2020). The continuity of performance during a crisis depends on effective leadership, and the leadership style employed in hospitals may substantially impact the crisis response procedure and the level of care provided. The capacity of the leader to analyze the crisis,

comprehend its components, plan a scientific solution, and intervene to control the crisis are all traits that impact crisis management (Mohamed et al., 2023).

2 | Background

Effective leadership and a solid grasp of systems thinking are essential for handling crises in the healthcare field. In order to demonstrate the applicability and importance of systems thinking in health crisis management, this literature review examines important topics, methodology, and conclusions from previous studies.

2.1 | The Approach of System Thinking

Systems thinking emerged in modern science in the 1920s, it applies the ideas of General Systems theory, which seeks to unify all natural and social sciences in one grand conceptual model to replace the classical mechanical worldview in organization studies. It aims to explain unrelated findings by exploring the interrelationships between organizations and the external environment (Grewatsch, Kennedy, & Bansal, 2023)

In the modern healthcare delivery system, providing efficient treatment necessitates sophisticated thought processes that go beyond the patient. Understanding and navigating the relationships that exist at all levels of the healthcare system is necessary for providing effective care. In order to educate practitioners who are skilled at navigating the interdependencies that exist in the system, medicine and the health professions have started to acknowledge and embrace the idea of systems thinking (Plack, Margaret, & Scott, 2019).

2.2 | System Thinking and Crisis Management

Crises are unfavorable and severe situations that can lead to the failure of a person, group, or civilization. Knowledge and research are therefore desperately needed to identify these crises and come up with better ways to prevent or eradicate them. Disaster management is an applied science that looks for ways to prevent crises from happening or, in the event that one does occur, to take the necessary steps for preparedness, prompt relief, and situation recovery to lessen its effects (Allahveisi, Ahmadi, & Mohammadi, 2019).

According to research, leaders must "don different hats," fulfill a range of responsibilities, and react appropriately when faced with crises because they bring with them numerous, continuous, and frequently crucial demands (e.g. Harris and Jones, 2020). Significant leadership responses to crises, including support, communication, information sharing, decision-making, team management, and more, have been emphasized in the literature (Schechter, Da'as, and Qadach 2024, & Sunder et al., 2023). There is an urgent need for nurse leaders and interprofessional healthcare practitioners to apply systems thinking (ST) internationally since crises impact diverse communities in different ways. (Phillips et al., 2018)

Principals are advised to apply systemic thinking, which is the capacity to view the whole in the context of the parts and to understand the whole beyond the sum of its components, when managing a pandemic crisis. According to (Schechter, Da'as, and Qadach 2024), principals with a systemic way of thinking tend to have a long-term perspective and the capacity to handle complexity, particularly in unpredictable situations like those that define crisis periods.

2.3 | Nursing Systems Thinking Conceptual Frameworks

Systems thinking approach used to understand, analyze, and optimize processes within complex systems. During crisis, a very large number of diverse and dynamically interacting elements are involved. The use of systems thinking and system -oriented safety management approaches has been on the rise and thus it may both help to make sense of the pandemic and learn lessons from it (Saurin, 2021)

3 | AIM

For efficient decision-making and care coordination, nurse leaders' use of system thinking is essential during crisis management. The goal of the current review is to highlight

important themes and discoveries by synthesizing the body of current research on the subject. A thorough grasp of how systems thinking might enable nurse leaders to successfully manage complex crises would be provided by this review. To achieve this, a number of goals were included: (i) locating studies that looked at how nurse leaders use system thinking in crisis situations; (ii) assessing the quality of the studies; and (iii) identifying important themes from the studies that provide insight into how system thinking enhances crisis management.

4 | METHOD

The current study used a narrative analysis through a thorough literature review that included a variety of techniques (system thinking in nursing). In order to find the pertinent research, a preliminary search strategy was first carried out, which included evaluating several databases and other sources in addition to the search phrases that would be used. When done properly, this is a crucial component in reducing the degree of bias in the review process (Centre for Reviews and Dissemination, 2009).

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (Page et al, 2020) we developed the methodological approach. This method makes it possible for the information found in the research papers and systematic reviews that make up this study to provide fresh insights into the field of nursing science.

4.1 | Search Strategy

To gather a large number of pertinent studies, the study combined date ranges and keywords. In order to find potentially relevant articles, a few preset search phrases were utilized using a pooling operator. [Systems thinking AND health] OR [system thinking AND health crises] OR [Nurse leaders AND system thinking] OR [Systems thinking NOT Abstract thinking] OR [Nurse leaders NOT Students] were the search phrases used. With assistance from a university librarian, two researchers chose the databases, created the search terms, then retrieved and examined the search results. There were two stages to the study selection process: To find potentially relevant studies, the titles and abstracts were first screened against the inclusion criteria. Second, each publication that was found to be potentially relevant in the first screening was subjected to a comprehensive screening against the inclusion criteria. Articles that had no connection to health, lacked an English translation, or were duplicates were excluded from this review.

The research procedure made use of a number of extensive databases that contained a large number of articles about the subject of study, which advanced the capacity to properly search and filter. From 2014 until July 2024, the Cochrane Library, PubMed Central, Science Direct, Medline (EBSCO), CINAHL, and Google Scholar were all included in the line databases search. The Centre for Reviews and Dissemination (2009) states that while systematic reviews address a wide range of problems, there is no universally accepted criteria for the number of databases that should be searched.

4.2 | Search results

There were 491 possible references found in the search. Two reviewers then independently assessed each abstract and title for relevance in accordance with the inclusion criteria. The paper was then included or excluded in accordance with the consensus of both reviewers. The review includes the 18 articles that were found by this second screening. A group of reviewers examined each paper separately for pertinent terms, methodologies, and subject matter after they were chosen for inclusion. (Fig. 1)

4.3 | Quality appraisal

Quality appraisal has been described as a systematic examination of literature to evaluate its reliability, value, and relevance in a particular context. It is important to note that published studies can be of varying quality (Remington, 2020). Verifying the quality, dependability, and applicability of the studies that are part of the review is part of quality appraisal. Reviewers should make judgments about the methodological strengths and

weaknesses of all included studies before making inferences about the phenomenon of interest, in order to achieve rigor in the literature review (Remington, 2020).

The appraisal method includes assessing the worth and supporting data of the research that were part of our review (Whelan et al., 2023). Examining the articles more thoroughly to determine their quality comes next, after all potentially acceptable articles have been gathered

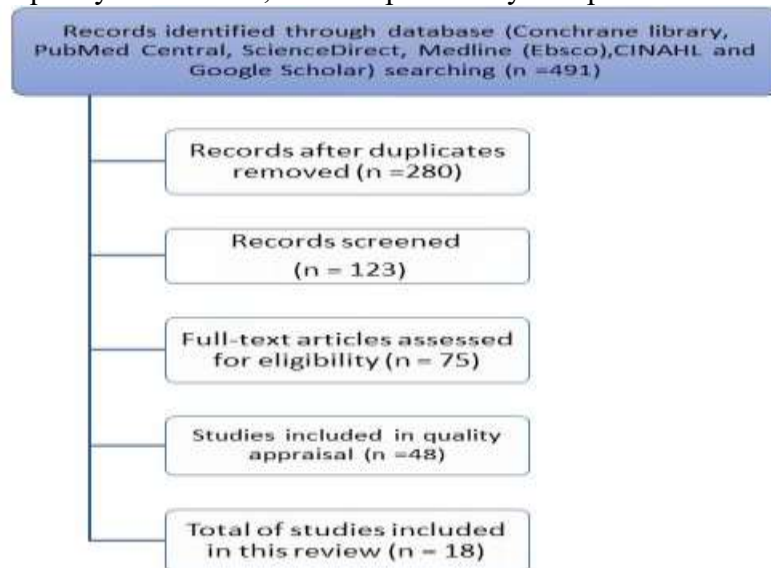


Figure (1): Flow for study selection

4.4 | Synthesis and abstraction of data

The methodological precision, completeness, and objectivity of different research investigations vary greatly, which occasionally could affect the results. According to (Zaidan and Zaidan, 2020), data abstraction is the process of arranging and retrieving information from included studies. The original classification of the publications in this evaluation was based on the databases in which they were found. Results, methods, settings, and samples were all described in depth. The validity and quality of the instrument, which was modified from earlier systematic reviews, were evaluated through analyses of all the published articles (Aldhafeeri et al., 2022).

5 | Results

5.1 | Methods, settings, and samples

Eight systematic literature reviews, four quantitative research, and six qualitative investigations are among the studies that were taken into consideration. Tables 1-3 present the methods and additional information of the included investigations.

5.1.1 | Key Findings

Some of the themes identified in this review on the efficacy of system thinking in crisis management include the significance of applying system thinking by nurse leaders, the impact of applying system thinking on crisis outcomes, training and education programs, organizational support, and nurses' attitudes toward using system thinking during crisis. The detailed details of each featured article are compiled in Tables 1-3.

TABLE 1 Quantitative article

Publication/date/ Authors	Aims/purpose	Design/methods	Context/setting/ Sample	Findings
Mohamed et al., 2023	Analyze the relation between crisis management in healthcare organizations and the innovativeness of nurse managers.	A correlational research design	63 nurse managers working at Belkas Central Hospital.	The results showed that all nurse managers possess outstanding crisis management skills at all phases of crisis management, but especially in the last two.
Patterson-Davis, 2020	In order to explore potential relations between systemic thinking and transformational leadership behaviors	Mixed-methods study (quantitative and qualitative)	110,000 students were recruited in 23 district Pennsylvania	Findings showed that systemic thinkers are aware that short-term solutions can have unforeseen repercussions, that enhancing the connections between components can optimize the system as a whole, and that gradual, coordinated effort and change can result in good changes for the entire system.
Mahsoon, & Dolansky., 2019	To investigate the relation between systems thinking, educational attainment, safety culture, safety competency, and safety performance among Saudi Arabian registered nurses employed in medical and surgical units.	A correlational cross-sectional design	In Saudi Arabia, 84 registered nurses employed in medical and surgical institutions.	The next steps that nurses need to take are safety training and systems thinking. Furthermore, regulatory modifications that allow businesses to encourage learning from errors can help lower medical error

TABLE 2 Qualitative articles

Publication/date/ Authors	Aims/purpose	Design/methods	Context/setting/ Sample	Findings
Verhoeven et al., 2024	In order to understanding of how nurses in Dutch hospitals, amidst COVID-19 pandemic, perceived their positioning in crisis management	A Qualitative Study	64 staff nurses conducted in Dutch hospitals Netherlands	Research shows that in practice, the interdependencies between different stakeholders—including nurses, board members, managers, and doctors—are frequently overlooked, which compromises efficient crisis teamwork.
Noseir, Eldahshan, 2023	In order to determine the relation between systems thinking and safe nursing care among studied nurses	A Qualitative Study	250 nurses at Menoufia University Hospital	Among the nurses in the study, there was a very statistically significant positive association between safe nursing care and systems thinking.
Stein Backes et al., 2022	This study aims to perform a critical-reflective analysis of leadership in nursing and health in the light of complexity thinking.	A Qualitative Study	Theoretical foundation is constituted by the author's primary productions of complexity thinking	Because it gives relationships, interactions, and systemic associations top priority when addressing and suggesting potential leadership methods, complex-systemic thinking is pertinent.

Balqis-Ali, al., 2021	et	Study conducted to assess Malaysia health systems' response to COVID-19.	A Qualitative Study	A total of 76 public respondent reached through various platforms	Addressing gaps through the application of systems thinking could aid in tackling complexity at a larger scale. This includes taking into account how one action affects other building blocks and taking a more flexible approach to the governing endeavor in order to create resilient systems.
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Ahmed, & Ibrahim, (2023)		The study aims to investigate head nurses' professionalism, systems thinking and its relation to safe nursing care	A descriptive correlational design	110 head nurses are the study sample	According to this study, head nurses' professionalism and systems thinking were positively correlated with safe nursing care in a highly statistically significant way.
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TABLE 3 Systematic reviews

Publication/date/ Authors	Aims/purpose	Design/methods	Context/setting/ Sample	Findings
Rusoja et al., 2018	Gain an understanding of the literature related to system thinking and complex science in health and to describe key terms and their usage	A systematic search of published Literature (databases EBSCO, BIOSIS, PROQUEST, PUBMED, and WEB OF SCIENCE	(<i>n</i> = 516) design and were conducted in the USA	The findings show that there is a noticeable increase in interest in system thinking concepts. Growing interest in system thinking, which is influenced by many different variables. The Sustainable Development Goals may be better implemented and

					practiced if system thinking concepts are applied.
Zhang et al, 2021	Retrospective review of the development & Application of systems thinking in health	A systematic search of published Literature (ASSIA, CINAHL, Cochrane, EMBASE, Google Scholar, MEDLINE, pubmed, Psycinfo, Science Direct	Designed and conducted in China		The findings showed that using system thinking to analyze the health system is becoming more and more popular.
Al Thobaity, & Alshammari., 2020	This study focused on exploring the issues facing nurses in their response to COVID-19 crises	A systematic search of published Literature (CINAHL, sciencedirect, proquest, Scopus, and Google Scholar)	8 study were included		To enable them to work and respond to this crisis with more confidence, nurses in all impacted nations should be assisted in identifying their requirements and providing support.
Phillips et al., 2018	The purpose of the paper is to answer the research question, What system thinking evidence fosters the effect of workplace civility in practice settings?	A systematic search of published Literature (ASSIA, CINAHL, Cochrane, EMBASE, Google Scholar, MEDLINE, pubmed, Psycinfo, Science Direct	38 studies were included in this study in the USA		A systems awareness model (SAM) was used to successfully integrate ST into academics. To encourage leadership in quality and safety among RN-BSN students, SAM promoted ST across curriculum.
Sunder et al., 2023	Examine the sensitivity of state and citizen communities through their enabling roles of direct and interaction	Various reliable sources: the University of Oxford, Apple Inc., WHO, and the World Bank Group.	843 observations of daily data representing 14 most-affected countries		The findings demonstrate that in an agile and flexible system thinking framework, subsystem flexibility is crucial for

	effects toward containment of pandemic crises.			pandemic management.
(Jesus, Landry, & Jacobs, 2020).	Explore the potential role of systems thinking in attempting to manage societies' responses to a pandemic.	They conduct a focused literature review of systemic frameworks, and using examples from Brazil and England,	Examples from Brazil and England	We can become more conscious of the whole context in which we live by using systems thinking. Each of them need critical recovery and critical systems heuristics, and they all need integrated critical systems to live with them and beyond them in the future.
Poroos et al., 2023	In order to highlight a diversity among health system performance frameworks and health system resilience frameworks	A systematic search of published Literature (pubmed database & Google scholar)	A total of 28 publications about the performance of health systems.	By adapting the building blocks to the various stages of a crisis, the final framework takes resilience into account and enables a thorough evaluation of the performance of an entire health system over the course of the crisis.
Chughtai, & Blanchet, 2017)	In order to narrate the development of ST in Public health	A systematic search of published Literature (pubmed database & Google scholar)	557 publications	Discussions about ST are becoming more and more common in the field of public health. Clarity and chances for additional education, research, and development may result from briefly following the emergence and evolution of certain concepts and author groups in public health literature.
Whelan et al., 2023	To identify and synthesis the peer-reviewed literature that has reported the	A systematic search was conducted of the online databases	14 studies were included in the final extraction.	There are few published peer-reviewed studies using systems thinking and

combined use of systems thinking approaches and implementation science constructs, to deliver population health interventions.	Of Medline, Embase, Cochrane Central; and within the EBSCO Host platform: ERIC, psycinfo And CINAHL for peer-reviewed studies published in English.	Ovid	implementation science for designing and delivering population health interventions. An exploration of synergies is worthwhile to operationalize Alignment and improve implementation of systems thinking approaches
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5.2 | Synthesis of findings

5.2.1 | Nurses perspectives of system thinking

System thinking is pertinent method because it gives relationships, interactions, and systemic associations top priority when addressing and suggesting potential leadership methods (Stein Backes et al., 2022). According to (Patterson-Davis, 2020) findings showed that systemic thinkers are aware that short-term solutions can have unforeseen repercussions, that enhancing the connections between components, can optimize the system as a whole, and that gradual, coordinated effort and change can result in good changes for the entire system.

5.2.2 | System Thinking and Nursing Practice

The lack of a fundamental System Thinking (ST) idea in the literature on public health has significant ramifications for both theorists and users. Teaching ST requires a broad range of terminology and historical ideas from the subject of systems and complexity, all of which are changing and interacting throughout time. To guarantee their proper application, practitioners must also comprehend the conceptual underpinnings of each technique (Rusoja et al., 2018).

According to (Noseir and Eldahshan., 2023), system thinking helped nurses understand how to view, communicate, and comprehend the relationships that determine how systems function, realize that proposed changes can affect the system as a whole, consider how multiple changes affect one another, see the whole beyond the parts and consider the parts in the context of the whole, think clearly and rationally before accepting any fact or argument result, and solve problems that require people to be effective in addressing problems and coming up with a solution.

5.2.3 | System thinking's and crisis management

Many studies mentioned that the concept of system thinking (ST) is gaining popularity, regardless of its theoretical foundation or coherence (Phillips et al., 2018). Also, (Rusoja et al., 2018) confirm that Implementing systems thinking (ST) across international borders is crucial for nurses' leaders and interprofessional healthcare practitioners, especially during health-related emergencies.

Furthermore (Zhang et al, 2021) findings showed that using system thinking to analyze the health system is becoming more and more popular. And (Sunder et al., 2023) demonstrate that in an agile and flexible system thinking framework, subsystem flexibility is crucial for pandemic management.

5.3 | Strengths and Limitations

The study's broad methodology, which consults a variety of sources to determine how systemic thinking improves healthcare crisis management, is one of its strongest points. It also

draws attention to health inequalities and provides healthcare professionals with helpful guidance on how to enhance outcomes for various patient groups after emergencies.

Limitations: The quality of the evidence provided in the manuscript under investigation was a criterion for inclusion and exclusion in this integrative review analysis. This review had a number of significant shortcomings. First, the search phrases were a limitation of this review. Despite our best efforts, significant contributions to the study of ST were probably overlooked due to the variety of terminology we came across during the research and the review process. Secondly, the material we investigated was limited to a rather short time frame (2010–2024).

5.4 | Practice, teaching, and research implications

Nurse leaders face a sense of tiredness in regard to the high level thinking, consideration for others, and relational implications, even though studies on systemic thinking shows favorable outcomes. A leader must be patient, disciplined, and deliberate in order to think systematically. In some circumstances, using this way of thinking could need taking traditional linear thinking into account.

6 | CONCLUSION

Our review's findings demonstrate how system thinking could help the healthcare industry better comprehend crisis management. Multidisciplinary work based on systems thinking, which has its roots in management studies, is necessary to take into account the interconnection of health care systems and identify relevant transition pathways.

7 | Relevance to Clinical Practice

This research has practical implications and focuses on using system thinking to improve crisis outcomes. System thinking leads to better crisis margining, more equitable treatment, and systemic emphasis.

Conflicts of Interest

The authors of this work state that they have no competing interests.

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