SYSTEMATIC REVIEW

Public Health Leadership During COVID-19 Pandemic: A Systemic Review

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ABSTRACT

Introduction: Nations around the world have enacted strict lockdowns due to COVID-19 pandemic and in order to alter and eliminate inadequacies in the public health care system, leaders' passion, vision, and influence are essential. This review aims to explore the role of public health leadership during the COVID-19 pandemic. **Methods:** PRISMA was used to report this review and article regarding leadership during the COVID-19 pandemic and published from March 2020 until December 2021 was selected. Scopus and PubMed database were used to search the articles. **Result:** There were 29 articles in the review that focused on the three main competencies which were adaptive, people and task. The findings of this review demonstrate how critical public health leadership effectively handling crisis like the COVID-19 pandemic. **Conclusion:** Therefore, all countries should invest on the development of these competencies among their public health specialists. Newer leadership strategies, competencies, styles, and qualities need to be researched upon and adopted accordingly.

Keywords: Pandemics; COVID-19; Leadership; Leaders; COVID-19 Pandemic

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INTRODUCTION

The World Health Organisation (WHO) was alerted about an outbreak of an unidentified respiratory disease on December 31, 2019, by Chinese authorities. On January 30, 2020, the WHO designated the COVID-19 outbreak a public health emergency of global significance. (1; 2). The WHO reported 7,818 confirmed cases worldwide as of January 30; the majority were in China, while 82 cases were reported in 18 countries other than China. (2).

The virus then rapidly and abruptly spread to numerous areas over time in waves. It quickly turned into a global tragedy rather than a local issue. Therefore, WHO labelled COVID-19 a pandemic on 11 March 2020 due to the frightening levels of severity and dissemination (2). Many countries worldwide imposed strict lockdowns, while others chose to used different management approach which led to the rise of cases and mortalities, and breakdown of health services in those countries (3, 4). Implementing strict lockdown on a city or a country is not an easy feat, as it basically restricts the freedom of movement of the people and can lead to distress of the affected population in addition to disruption of everyday life. Several factors contribute to the successful lockdown of an area or country, and the most important of them is good leadership of the people managing public health issues in the government. Leadership is the ability of an individual to influence, motivate, and lead, and it is an important attribute to leaders in public health during a crisis situation such as a pandemic.

Managing the COVID-19 highlighted another crucial aspect of leadership, which was effective public leadership. effective public leaderships are a form of collective leadership in which public agencies collaborate to create public value for the benefit of all (1, 5). Public health officials have been challenged by COVID-19 to be effective communicators, fearless, accountable managers, knowledgeable in the field of public health, excellent in coordination, decisive, and

situational awareness, and to inspire trust in both the team and the community (6; 7). Additionally, in order to alter and eliminate deficiencies in the public health care system and make it more long-term sustainable, leaders' passion, vision, and influence are crucial. (8;9).

There is currently a lack of knowledge on crucial leadership roles and qualities needed to control the pandemic, despite the fact that numerous research have already examined various aspects of public health leadership during the COVID-19 crisis. Therefore, the purpose of this systematic review is to characterise common and important public health leadership traits that were used globally during the COVID-19 pandemic and to analyse the responsibilities of public health leadership during that time. For the benefit of public health leaders in future pandemics, the findings of this research may emphasise the crucial facets of public health leadership during periods of a biological crisis like that of COVID-19.

MATERIALS AND METHODS

Selection and Eligibility

A systematic review of papers was performed by following the reporting checklist of the PICO strategy as mentioned in the PRISMA protocol. Articles were considered if they met the following criteria: (a) they reported a preliminary study on the COVID-19 pandemic; (b) the publication date was after March 11, 2020; (c) the study was about health systems, organisations, or healthcare management; (d) the study involved frontline healthcare workers or staff organisational decision-makers; or (e) mixed methods studies where qualitative data collection and analysis. Articles were excluded if (a) articles related to patient outcomes or experiences that did not consider the organizational context of care, (b) date of publication before March 2020, (c) non-English articles, (d) studies that did not use qualitative research methods, (e) clinical studies, (f) study protocols, (g) pre-prints or unpublished articles, and (h) short communications, letters, editorials or commentaries.

Search Strategy

All records were last searched in the Scopus and PubMed bibliographic databases to find potentially pertinent papers. The following terms and all their synonyms used for P (Population) was "public health leadership", followed by I (Interest), which was "importance", and lastly, Co (Contex) were "COVID-19 pandemic" OR "SARS-COV2" OR "pandemic" in the databases. The search strategies were developed and improved by the study's reviewers. Table I contains the final search plan for the two databases. Excel was opened after the final search results were exported.

Data Extraction and Validity Assessment

Three reviewers used Covidence, the principal screening and data extraction tool used by Cochrane authors conducting typical intervention reviews, to screen the publications. The data from the chosen publications was then extracted by the reviewers, who then organised it in a spreadsheet. All the publications found by searching for possibly relevant articles had their titles, abstracts, and full texts examined sequentially by the reviewers. The spreadsheet contained pertinent data about the study's methodology (study design, institution), the article's substance (the primary research question and response, as well as important discussion points), and the publication's specifics (first author, publication date). The spreadsheet also listed the justifications for leaving out some articles. Each full-text article was read by three of the study's authors. Categories of competencies were being created as the data from the articles was being retrieved, based on the thematic analysis of the articles' main repeating topics. These themes offered hints regarding traits very relevant to the epidemic. As a result, each article was assigned to one of the following skills according to its content and key summary elements. The competencies were then created by combining the traits to create bigger, more powerful groups. Later, the articles were divided into subcategories based on traits that appeared often within each competency group. The analysis provides a comprehensive overview of public health leadership traits that were used globally during the COVID-19 pandemic and the responsibilities of public health leadership during that time. All of the writers on this review team participated in discussions to settle disagreements on the category assignments.

Table I : Key words used during database searches

Scopus		
#	**Searches**	**Results**
1	TITLE-ABS-KEY(public) AND (health) AND (leadership) AND (COVID-19OR SARS-COV2 OR pandemic)	3910
PubMed		
#	**Searches**	**Results**
1	"public" AND "health" AND "leadership" AND "COVID-19OR SARS-COV-2 OR pandemic"	810

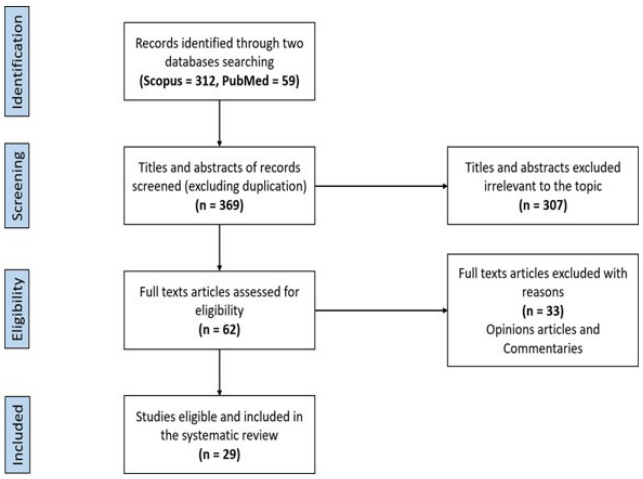

Fig. 1 : Preferred reporting items for systematic reviews and Meta-Analyses (PRISMA) flow diagram.

RESULTS

The searches returned a total of 4720 records before duplicate records were eliminated. The eligibility of 62 full-text publications was evaluated. 33 of them were eliminated for the explanations listed in Fig. 1 as a result. 29 articles remained, and they were chosen for this systematic review. The majority of these publications were opinion pieces devoid of factual information. Based on their content, the 29 articles were divided into three competencies, as illustrated in Fig 1. The categories were determined because they appeared frequently in the publications and suggested traits that were very pertinent to the epidemic.

18 of the 29 studies that were chosen to be included in the final version of our study used qualitative techniques like case studies and interviews.

Table II : Study characteristics of reviewed literature

Num	Authors (year)	Data Collection	Country	Setting
1	Balqis et al (2021)	Qualitative	Malaysia	Health systems
2	Petridou et al (2021)	Qualitative	Greece and Sweeden	Government and health system
3	Ha et al (2020)	Review	Vietnam	Government and health system
4	Wardman et al (2020)	Review	The United Kingdom	Government and health system
5	Hattke et al (2020)	Qualitative	Germany	Health systems
6	Nicola et al (2020)	Review	General	Government and health system
7	Chua et al (2020)	Review	Singapore	Health systems
8	Al-Khateeb et al (2020)	Review	General	Public health
9	Akintobi et al (2020)	Qualitative	The United States	Public health
10	Schulze et al (2021)	Review	Germany	Public health
11	Moonasar et al (2021)	Qualitative	South Africa	Health systems
12	Combden et al (2021)	Review	Canada and The United States	Government and public health
13	Lanyero et al (2021)	Qualitative	Ethiopia	Government and health system
14	Knaul et al (2021)	Qualitative	Brazil and Mexico	Health systems
15	Kosack et al (2021)	Review	General	Government and health system
16	Shu & Wang (2021)	Qualitative	China	Public health and community
17	Correia et al (2020)	Quantitative	Portugal	Health systems
18	McGuire et al (2020)	Qualitative	New Zealand	Government
19	Hatcher et al (2020)	Qualitative	The United States	Political and public health
20	Hur et al (2020)	Qualitative	South Korea	Public health
21	Xu & Basu (2020)	Qualitative	The United States	Government and public health
22	Li et al (2020)	Qualitative	The United States	Government and health system
23	Jamieson et al (2020)	Qualitative	New Zealand	Government and public health
24	Warren et al (2021)	Qualitative	UK, France, Germany, Sweeden and Switzerland	Government and public health
25	Klimovsky et al (2021)	Qualitative	Czech Republic and Slovakia	Government and health system
26	Bowsher et al (2020)	Qualitative	The United Kingdom	Public health
27	O'Donnell et al (2020)	Qualitative	The United Kingdom	Government and health system
28	Lee et al (2020)	Review	Korea	Government and public health
29	Olufadewa et al (2021)	Review	China, Italy and The United States	Public health

Table III : Public health leadership of reviewed literature

Num	Authors (year)	Competencies								
		Adaptive competencies			People competencies			Task competencies		
		Resilience	Making decision	Strategic thinking	Inspiring others	Compas-sion	Trustwor-thiness	Readiness	Communi-cation	Collabora-tion
1	Balqis et al (2021)	x	x	x			x	x	x	x
2	Petridou et al (2021)		x				x			x
3	Ha et al (2020)				x		x		x	x
4	Wardman et al	x	x	x		x	x		x	x
5	Hattke et al (2020)		x	x			x	x	x	x
6	Nicola et al (2020)	x	x			x	x		x	x
7	Chua et al (2020)	x		x	x		x	x	x	
8	Al-Khateeb et al 2020	x	x	x	x		x		x	x
9	Akintobi et al (2020)			x	x					
10	Schulze et al (2021)	x	x			x	x	x	x	x
11	Moonasar et al 2021	x	x	x			x		x	x
12	Combden et al (2021)		x				x		x	
13	Lanyero et al (2021)	x			x			x	x	x
14	Knaul et al (2021)	x	x				x	x		x
15	Kosack et al (2021)		x	x					x	
16	Shu & Wang (2021)		x		x		x		x	x
17	Correia et al (2020)		x	x	x		x	x	x	x
18	McGuire et al (2020)		x	x	x	x	x		x	x
19	Hatcher et al (2020)		x			x	x		x	
20	Hur et al (2020)	x	x		x	x		x	x	x
21	Xu & Basu (2020)	x	x	x			x		x	x
22	Li et al (2020)		x				x		x	
23	Jamieson et al 2020	x	x		x		x	x	x	x
24	Warren et al (2021)	x	x				x	x	x	
25	Klimovsky et al 2021		x	x					x	x

26	Bowsher et al 2020		x	x			x	x	x	x
27	Bowsher et al 2021	x	x	x	x		x	x	x	x
28	Lee et al (2020)		x	x	x		x	x	x	x
29	Olufadewa et al 2021	x		x	x			x	x	x

Quantitative research was utilised in one study. Reviews of ten studies were included. Every article discussed experiences relating to COVID-19. These studies' researchers concentrated on a variety of leadership traits seen in communities, health systems, public health organisations, and local governments. These studies originated in the United States, the United Kingdom, nations of the European Union, and several Asian nations. Table II lists the characteristics of the study in brief.

We discovered and classified crisis leadership competencies using a theme analysis technique into the task, people, and adaptive competencies. The 29 articles were categorized into three competencies which were (a) adaptive, (b) people and (c) task. In each of these competency category, there are also corresponding attributes, which were as shown in Table III. Attributes of adaptive competency were resilience, making decision, and strategic thinking. Attributes of people competency were inspiring others, compassion, and trustworthiness, while attributes of task competencies were readiness, communication, and collaboration.

Adaptive competencies focus on the skills and actions required to respond to the dynamic character of pandemic responses. Successful crisis leadership requires public health leaders to adjust to changing circumstances quickly. Of the included studies, 24 articles (82.8%) discussed the importance of making decision attributes. The other two attributes which need adaptation were strategic thinking (55.2%) and resilience (51.7%) which are crucial when facing the COVID-19 pandemic. For example, during dynamic crises, public health executives were frequently required to make critical choices with little evidence, necessitating strategic thinking and resilience in adjusting to changes in the uphill struggle of delivering ongoing services to the public.

People competencies are focused on the skills and behaviours needed to lead pandemic response activities by managing interpersonal relationships. The power of public health leaders to mobilize people for collective action was emphasized as critical in pandemic leadership. Trustworthiness attribute was mentioned in most studies (79.3%) compared to compassion, in only six studies (0.2%). Almost half of the studies found the ability to inspire others (44.8%) as an important competency during the COVID-19 pandemic. For instance, leaders who demonstrated empathy for their team members, respect for others' opinions, and an inclusive attitude to engaging others were able to build relationships with others, increase trust and morale, reduce work-related stress, and encourage engagement for their teams and others.

Task competencies cover the knowledge, abilities, and attitudes required to manage pandemic reactions. Depending on their knowledge competence, public health officials should be capable of carrying out tasks like preparation and planning, communication, and teamwork during the COVID-19 pandemic crisis. Among the reviewed articles, communication (89.7%) appeared as an essential leadership characteristic in 89.7% of the research included, followed by collaboration (75.9%) and readiness (55.2%). During the pre-crisis period, leaders were expected to use good communication abilities to forge functional alliances and take part in collaborative planning exercises. Planning and preparation are both parts of readiness. Leaders were required to use practical communication skills during the crisis event to involve others in risk response preparedness, share emergency risk communication with the public, and express a clear vision for encouraging a feeling of purpose among all stakeholders. Furthermore, communication abilities relating to media communication were deemed crucial.

DISCUSSION

Review the current literature addressing leadership within the realm of public health crisis management, specifically highlighting its contribution to addressing and controlling the COVID-19 pandemic. Evidence and debate on this topic from all across the world, both during and after the epidemic, demonstrate the importance of leadership in a scenario involving a biological catastrophe. In times of crisis, leaders play a crucial role in decision-making, building trust, and maintaining effective communication (38). As a result, the traits, skills, and competences of the leader decide whether crisis management operations succeed or fail.

When managing crises, many studies stressed the importance of leaders having emotional intelligence

traits such "empathy, self-awareness, persuasion, collaboration skills, and the capacity to manage relationships' (30,31,32). The traits of crisis leadership are further extended into a list that includes "making decisions, communicating, creating organisational capabilities, maintaining an effective organisational culture, managing numerous constituencies, and growing human capital" (33,34,35).

A leader must be competent in his/her role as a leader. In the adaptive competency category, the three main attributes are resilience, ability to make decisions, and strategic thinking. Resilience means adopting a flexible system or tool during the pandemic (10). Leaders also need to be prepared and act quickly, responsively, and adaptively. There is also the need to adapt to the changing situation, for instance, new training methods and educating professionals and new ways of researching with a particular focus on COVID-19 (11), while at same time ensuring maintenance of health service delivery during the pandemic (12). In the continuation of service to the public, the need to prioritize patient-centered medical homes and neighbourhood models must also be focused on.

Since a leader is considered to be someone who has a large social impact on those around them, having the ability to make quick decisions is essential for an effective crisis response. This is evidently seen in New Zealand, which stressed the importance of having the capacity to decide what is best given the circumstances at the time (13). For instance, it is necessary to take early public health actions to decrease imported cases and to identify and isolate infections. Data from personnel in the field will assist leaders in better assessing the situation. This knowledge must be appropriately processed and summarized before being presented the leaders, to aid the leaders in the process of decision-making (40). Instead of employing complex scenarios with several assumptions, choices in emergency management must be made swiftly using the best information available (14).

Along with the aforementioned skills, the COVID-19 pandemic will benefit the country if proactive public health and community-focused policy leaders are involved, and community stimulus methods are prioritised (15). Higher leadership should establish or approve critical analytical and fair prioritisations based on strategic thinking during a crisis to enhance the wellbeing of the organisation (39). Strategic thinking involves scale-up infection prevention and control measures and an effective disease surveillance system in gathering data (16,17). In the early phases of an outbreak, data collected can be useful information required to ensure risk mitigation. According to Bowsher (2020), subject matter specialists who can effectively interact with all key sectors, which play crucial roles in the management of the pandemic, should be included in centralised public health crisis management (18).

People competencies consist of inspiring others, compassion, and trustworthiness. Leaders today, more than ever, must elicit people's cooperation by inspiring them. There are two primary methods for doing so: motivation and inspiration. Motivation involves positively persuading others to act in a way that achieves a short-term goal. In motivating someone, providing inspiration is important. Inspiration will further enhance the motivation. Inspiration can be in the form of explaining to the people about principles, corporate identity, each person's identity, or the leader's long-term goals (41). In a study conducted in China, where conventional leadership was focused on achieving organisational goals by utilising authority to inspire and motivate followers through organisational and bureaucratic means, motivation and inspiration in the context of crisis leadership were demonstrated (19).

Empathy and altruism are related concepts. Empathy is the feeling that an individual have, of profound compassion and sadness towards another person, that occurs when confronted with another's pain. This profound feeling is usually accompanied by a strong desire to relieve the suffering (42). Hatcher (2020) highlighted the need to practice compassion in crisis leadership during a pandemic by not ignoring the community when making decisions (20). Leaders should differentiate between people's needs while speaking to the nation and encourage conversation and solutions for behavioural and mental health that are specific to their culture.

The attribute of a person that inspires reliability is trustworthiness. In psychology, trustworthiness is frequently characterized as an attitude reaction to contact or trade; it is an impressive construction resulting from three qualities: competence, compassion, and integrity. As mentioned by Knaul (2021), accountability and credibility shown by leaders will help convince the public when implementing any measures during a pandemic (21). Previously, trustworthiness was seen as a constant property of an individual, but it is now increasingly recognized as a dynamic of interaction between parties. During a pandemic, trustworthiness and belief in that trustworthiness are critical. According to Ha (2020), clear communications and statements on COVID-19 through official and social media were crucial in preventing any confusion and spreading fear among the general people (22).

Lastly, task competencies focused on readiness, communication, and collaboration as the attributes. The need for people and leaders to be prepared has increased during the COVID-19 epidemic. Because risk

management involves projecting potential risk events that could happen and develop into crises and putting in place a system of controls to prevent such risk events and mitigate their impact if they do, prevention and risk management go hand in hand (43). According to studies, improving detection and response capabilities is a crucial investment in pandemic preparedness (16,23). A thorough crisis response strategy that is tailored to a particular risk profile must be developed and approved by leaders and governments. Regular disaster rehearsal exercises must also be conducted, and the crisis response plan must be tested and updated as necessary. Crisis readiness must also include access to crisis financing by pooling resources as a proactive measure when facing an epidemic (12).

The act of transmitting information from one place to another that involves at least one sender, a message, and a recipient is referred to as communication. Numerous factors, such as people's emotions, the cultural setting, the medium used to communicate, and location, can affect communication (36,37). During the COVID-19 pandemic, all these factors were negatively affected, and the situation was very challenging for effective communication. However, timely, accurate, clear, consistent, and transparent communication from public health authorities is essential and must be carried out as effectively as feasible (12, 24). It is crucial to have a designated lead spokesperson who interacts with the public and fosters trust during a crisis to help and ensure effective communication. This is so that leaders can avoid implementing and communicating solutions in a way that is unclear or inconsistent across regions during these hard pandemic times (25). Communication about the impacts of the infection, mitigation and disease containment process should be emphasized to the public. According to Xu (2020), among the practical actions leaders can do to improve communications during COVID-19 are being visible all the time, prioritising care for employees, caring for them, and demonstrating empathy for them (26). Public health leaders who demonstrated credibility, express command of the situation, the obligation to influence and participate in ongoing and appropriate decisions and communications, and a transparent communication style could, in general, inspire and influence change during a crisis (27,28,29).

Collaboration is cooperation; it is the process by which two or more people work together to produce something. When two parties work together, they commit to the idea that they will generate a better outcome than if they worked separately. When faced with the COVID-19 pandemic, leaders and governments should coordinate and collaborate at multisectoral level, forming partnerships with commitments to clear directional requirements. This was proven in several studies (18, 21, 22).

Limitation

The range of the literature searches places restrictions on our review. Since the majority of the material was written or published during the COVID-19 epidemic, only that literature was included, and the study was only descriptive in nature. The use or reference to established conceptual or theoretical frameworks on leadership was minimal in this review, because of the vastness of scope of leadership facets presented in the selected literature.

Recommendations

To better comprehend the temporal characteristics of pandemics and associated leadership behaviours, we suggest that authors of future pandemic leadership research widen their methodological techniques and use mixed method approaches. Future studies should broaden the focus on leadership by examining elements related to adaptive and people competencies in addition to task capabilities. Aside from that, contextual elements such as economic, cultural, and political that influence how leadership qualities are shown during a pandemic should be considered. New leadership characteristics, styles, and frameworks that were apparent and used in the COVID-19 pandemic such as Value-Based Leadership and Swarm Leadership should be explored.

CONCLUSION

The findings of this research demonstrate how critical public health leadership and its characteristics are to effectively handling a novel biological crisis like the COVID-19 pandemic. Regardless of the resources a country has in combatting the pandemic, without good leadership the resources will not be effectively and efficiently used, and the pandemic battle can be lost. There are three main public health leadership competencies which are significant in the context of successful COVID-19 pandemic management, which are adaptive, people, and task competencies. To be competent in these aspects, public health leaders must have the following attributes or qualities: resilience, decision-making ability, strategic thinking ability, ability to inspire others, compassion, trustworthiness, readiness, good communication, and able to foster collaboration. Therefore, all countries should invest and focus their resources on the development of these competencies among their public health specialists. Newer leadership strategies, competencies, styles, and qualities need to be researched upon and adopted accordingly. Other factors affecting leadership should also be studied.

ACKNOWLEDGEMENT

The authors are especially indebted to Dr. Abdul Rahman bin Ramdzan for his continuous support and valuable guidance to this project and our pursuit of our DrPH at Universiti Malaysia Sabah.

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