International Studies of Management & Organization

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/mimo20

Unraveling the complexities associated with leadership during times of supply chain crisis: a study on the healthcare sector

Manisha Tiwari, George Lodorfos, Zoe McClelland & Shravan Nair

To cite this article: Manisha Tiwari, George Lodorfos, Zoe McClelland & Shravan Nair (16 Feb 2025): Unraveling the complexities associated with leadership during times of supply chain crisis: a study on the healthcare sector, International Studies of Management & Organization, DOI: 10.1080/00208825.2025.2465002

To link to this article: https://doi.org/10.1080/00208825.2025.2465002

Published online: 16 Feb 2025.

INTERNATIONAL STUDIES OF MANAGEMENT & ORGANIZATION
https://doi.org/10.1080/00208825.2025.2465002

Routledge
Taylor & Francis Group

Unraveling the complexities associated with leadership during times of supply chain crisis: a study on the healthcare sector

Manisha Tiwari[a], George Lodorfos[b], Zoe McClelland[b], and Shravan Nair[b]

[a]Faculty of Business, Law and Politics, University of Hull, Hull, UK; [b]Leeds Business School, Leeds Beckett University, Leeds, UK

ABSTRACT

The role of leadership during times of crisis has attracted significant attention in academic literature; however, the impact of crisis leadership on mitigating supply chain disruptions in the healthcare sector remains a relatively under-researched area. This study aims to bridge the gap in supply chain leadership theory. We employed an inductive approach to develop a crisis leadership theory focused on mitigating supply chain disruptions within the healthcare sector. To gather insights, we conducted in-depth semi-structured interviews with 33 participants from the healthcare sector who navigated the challenges posed by the COVID-19 crisis. Drawing on the participants' experiences and utilizing Gioia's framework, we established a three-order data structure encompassing Leadership Attention Scope (LAS), Crisis Leadership (CL), and Mitigation of Supply Chain Disruption Strategies (MSCD). Furthermore, we developed a conceptual model based on the interplay of these three constructs. The model elucidates the Attention-Based View (ABV) and Upper Echelon Theory (UET) in the context of healthcare crisis, explaining the role of crisis leaders. This study significantly contributes to the ABV, UET, and supply chain risk management theories. Additionally, the findings provide valuable guidance for healthcare professionals, including chief medical officers, procurement managers, healthcare center directors, policymakers, and OPD staff involved in addressing healthcare supply chain disruptions. Finally, we outline the study's limitations and suggest directions for future research.

KEYWORDS

Attention Based View (ABV); crisis leadership; healthcare supply chain; inductive approach; supply chain disruption; Upper Echelon Theory

Introduction

In recent years, the world has witnessed a surge in crises stemming from natural and artificial disasters (Behl and Dutta 2019; Gupta et al. 2016; Mohammadi et al. 2023). These events have brought to light the inadequacies in disaster management, with a predominant factor being the lack of effective coordination (Altay and Pal 2014; Gupta et al. 2020; Ruesch et al. 2022) and leadership (Salem, Van Quaquebeke, and Besiou 2018; Salem et al. 2019). The consequences of these shortcomings are evident in the suboptimal response to crises and the failure to address their root causes (Bailey and Breslin 2021; Xu et al. 2024; Tavella 2022). It is imperative to address these shortcomings to enhance preparedness and response strategies for future calamities (Hällgren, Rouleau, and De Rond 2018). Salem, Van Quaquebeke, and Besiou (2018, Salem et al.

CONTACT Manisha Tiwari m.tiwari@hull.ac.uk Faculty of Business, Law and Politics, University of Hull, Hull, HU6 7RX, UK

2019) have underscored the pivotal role of leadership in crises, particularly in forming disaster relief teams. These teams often lack the necessary familiarity and experience, making effective leadership a crucial factor in their successful coordination and performance during challenging situations (Balcik et al. 2010; Wolbers, Boersma, and Groenewegen 2018).

The historical records reveal numerous instances where ineffective leadership significantly contributed to the mismanagement of disasters (Boin and Hart 2003; James, Wooten, and Dushek 2011). However, the ability of leaders to mobilize resources and enhance coordination through clear and effective communication has been highlighted as crucial during these catastrophic events (Probst and Raisch 2005; Schaedler, Graf-Vlachy, and König 2022; Quy, Tran, and Dinh 2024). This underscores the importance of effective leadership in inspiring and motivating teams to perform at their best (Zander 2020). Most importantly, establishing and maintaining trust and commitment among all stakeholders involved in disaster relief efforts has been recognized as a critical factor in effectively addressing the challenges posed by such crises, underscoring their significance (Williams et al. 2017; Bealt and Mansouri 2018; Shaheen and Azadegan 2020).

The role of effective and visionary leadership in addressing and managing the health crisis, particularly in light of the diverse and sometimes conflicting responses from the academic community amid the ongoing COVID-19 pandemic, has sparked widespread interest and debate (Park 2021; Pradies et al. 2021; Klebe, Felfe, and Klug 2021; Nguyen et al. 2022; Restrepo-Morales, Valencia-Cárdenas, and García-Pérez-de-Lema 2024). The healthcare sector plays a crucial role in promoting the overall well-being and development of individuals, which in turn contributes significantly to the growth and progress of a nation (Haldane et al. 2021; Sorensen et al. 2021; Nazar, Meo, and Ali 2022). Developed countries such as the USA, UK, Canada, Australia, Japan, European countries, and South Korea have set high standards for public health, including healthcare infrastructure and services (Min, Lee, and Joo 2022). The robust healthcare systems in developed countries result from comprehensive leadership from national governments and regional health authorities to various health organizations (WHO 2020; An and Tang 2020; Xu et al. 2024). This multi-layered leadership ensures the coordination and implementation of effective healthcare policies, the allocation of resources, and the strategic vision necessary for a successful healthcare system (Ho and Pinney 2016; Mervyn, Amoo, and Malby 2019; Looman et al. 2021). The COVID-19 crisis has not only unveiled the vulnerability of the healthcare systems in developed countries, but it has also served as a testament to the shortcomings of leadership in upholding a strong and resilient healthcare system (Kumar et al. 2021; Behl et al. 2023; De Foo et al. 2023). In the context of the developing economy, several critical issues have contributed to the subpar state of affairs (Kumar, Singh, and Singh 2024). The primary factors responsible for this situation include the ongoing economic downturn, the dearth of effective leadership, and the inability to exert necessary control over various aspects of the economy (Hartwell and Devinney 2021; Pounder 2022). The role of leadership in navigating and addressing healthcare crises has been the subject of considerable interest and scrutiny (Klebe, Felfe, and Klug 2022; Dubey 2023). However, there is a lack of comprehensive understanding of empirical studies focusing on the complexity of leadership in these situations (Nicolini and Korica 2021; Riggio and Newstead 2023). Especially within the field of operations and supply chain management, there has been a lack of focus by organizational scholars on addressing leadership issues within the healthcare supply chain crisis that has emerged as a result of the COVID-19 pandemic (Harland et al. 2021; Hossain, Thakur, and Kazancoglu 2023). We acknowledge that the existing knowledge of crisis leadership theory is inadequate and lacks a solid groundwork. To address this research gap, the aim is to develop a crisis leadership theory within the healthcare supply chain, utilizing the attention-based view of the firm (Ocasio 1997) and upper echelon theory (Hambrick and Mason 1984).

During times of crisis, the role of leadership becomes particularly critical in navigating the challenges that arise (Klebe, Felfe, and Klug 2022). However, a review of existing studies reveals a

range of mixed findings regarding the effectiveness of crisis leaders in managing crises, as Klebe, Felfe, and Klug (2021) noted. These inconsistencies underscore the complexity of leadership dynamics in times of urgent need. In their research, Harland et al. (2021) specifically emphasize the importance of leadership during health crises, particularly in how it affects the procurement and distribution of essential healthcare supplies. This is especially relevant in the acute health crisis prompted by the COVID-19 pandemic, where timely access to medical equipment and resources was a matter of life and death. Further expanding on this topic, Dubey (2023) investigates the moderating effects of crisis leadership on two crucial components: information visibility and collaboration among healthcare stakeholders. Both factors are vital for effectively addressing a health crisis, as they facilitate transparency and cooperation among different entities working toward a common goal. Despite these valuable insights from recent studies, the literature regarding crisis leadership in healthcare remains fragmented. There is still a lack of adequate understanding of the specific behaviors and decision-making processes exhibited by top leaders in healthcare organizations during significant health crises. To address this gap, we draw a parallel between the experiences and leadership responses observed during the COVID-19 crisis and those that may occur during any future health emergencies. While the details of different crises may vary, analyzing the lessons learned from the COVID-19 pandemic can provide valuable insights that may inform strategies for future pandemics or health crises (Smollan and Mooney 2024). Therefore, we posit our first research question as:

RQ1: How do the top leaders of the healthcare organization behave during a healthcare supply chain crisis?

The behavior of leaders during crises is a critical factor that distinguishes crisis leaders from those who employ other leadership styles (Wu et al. 2021; Riggio and Newstead 2023). Particularly in the context of healthcare supply chain challenges, effective crisis leadership is essential for navigating complex and rapidly evolving situations (Sharma et al. 2022; Vázquez-Martínez et al. 2024). Despite the significant focus on this area, the existing literature does not adequately explore how factors such as attention and situational awareness influence crisis leaders' behavior and decision-making capabilities (Sætren et al. 2023; Zhao et al. 2024). Understanding this relationship is vital, as it can provide insights into how leaders can better respond to crises and make informed decisions under pressure. To fill this gap in research, we propose our second research question:

RQ2: How do the leaders of the healthcare organization make decisions to move and deal with the supply chain crisis?

To minimize the impact of the ongoing crisis on the healthcare supply chain, crisis leaders must develop comprehensive mitigation strategies that specifically address the disruptions occurring within this vital system (Dixit and Dutta 2024). These strategies should include a variety of actions designed to identify vulnerabilities, enhance communication, and streamline processes to ensure the continuous flow of necessary medical supplies and resources (Zaoui et al. 2023). Despite the significance of these strategies, the existing literature does not provide a thorough understanding of the methods and approaches that crisis leaders can use to create effective mitigation plans (Govindan et al. 2023). There is a clear need for more detailed research exploring how these leaders can assess the challenges posed by disruptions, engage with stakeholders, and implement practical solutions to protect the integrity of the healthcare supply chain during times of crisis (Rahman et al. 2024). Thus, to address these research gaps, we propose our third research question:

RQ3: How do crisis leaders influence the mitigation strategies developed by healthcare organizations during disruptions in the supply chain of critical healthcare items?

To investigate the three research questions, we intend to employ an inductive approach, described by Gioia, Corley, and Hamilton (2013), to guide our research methodology. By leveraging this approach, we aim to garner insights and develop a theory grounded in the data obtained from qualitative interviews conducted with the participants. This process will enable us to derive conclusions and formulate research propositions based on the empirical evidence collected during the interviews.

The manuscript is organized as follows. The second section presents a detailed theoretical overview. The third section delves into the research design, which focuses on data collection and analysis. The fourth section presents findings from the study. The fifth section presents a detailed discussion that outlines our research contributions to theory and practice. We further outline the limitations of the study and future research directions. Finally, we conclude the study.

Theoretical overview

Attention based view

The attention-based view (ABV) is a theoretical framework that focuses on predicting the behavior of decision-makers within a firm (Ocasio 1997). This framework examines how these decision-makers allocate their attention in different situations (Ocasio, Laamanen, and Vaara 2018). The ABV suggests that the distribution of attention is tailored to specific circumstances and plays a crucial role in shaping organizational decision-making processes (Joseph and Wilson 2018). The attention-based view asserts that an organization's behavior is fundamentally influenced by how its decision-makers direct and distribute their attention (Ocasio 1997; Joseph and Wilson 2018). According to this perspective, the allocation of attention by crucial individuals within the organization significantly shapes the firm's strategic decisions, resource allocation, and overall performance (Ren and Guo 2011). In essence, this framework emphasizes the crucial role of attention in driving organizational behavior and outcomes (Ocasio and Joseph 2018). This study's primary objective is understanding crisis leaders' behavioral patterns during crises (Bundy et al. 2017). We further explore how these leaders allocate their attention to diverse and pressing issues, which necessitate prompt decision-making (Perlow, Okhuysen, and Repenning 2002; Owens and Hekman 2012; Zheng, Liu, and Gong 2016). Furthermore, we are interested in examining the challenges when leaders are confronted with the need to make swift decisions in the face of limited resources (Salem et al. 2019; Brielmaier and Friesl 2023). The attention-based view provides a valuable framework for this study, allowing us to delve into the intricate decision-making processes of crisis leaders and uncover what distinguishes them in moments of crisis (Fernandes and Burcharth 2024). This framework helps us understand how crisis leaders allocate their attention and focus, enabling us to gain insights into their effective decision-making strategies and behaviors during challenging situations.

Upper Echelon theory

To understand how decision-makers allocate their attention, it is essential to consider top managers' or leaders' background characteristics and perspectives. These influential individuals often shape the overall direction and focus of the organization through their unique experiences, expertise, and viewpoints (O'Kane and Cunningham 2012). By taking into account their backgrounds and perspectives, we can gain valuable insights into the decision-making processes and priorities within the organization (Waldman, Javidan, and Varella 2004; Hambrick 2007). The Upper Echelon Theory (UET) delves into the intricate ways in which cognitive values and observable characteristics, such as age, functional tracks, previous experience, educational background, socioeconomic roots, financial status, and group characteristics, exert a significant influence on a

firm's strategic decisions (Hambrick and Mason 1984). These decisions encompass various choices, including product innovation, unrelated diversification, related diversification, acquisition, capital intensity, administrative complexity, forward and backward integration, response time, and investment in fixed assets (Hambrick 2007). The impact of these choices is far-reaching as they aid organizations in enhancing their profit margins, increasing their market share, and fortifying their ability to weather challenging business environments (Hambrick and Mason 1984). In our research, considering the ABV framework, we integrate the UET perspective to provide deeper insights into the behavior of crisis leaders and how they prioritize their actions.

Leadership

Leadership has been the subject of extensive research, analyzing it as a process and a set of attributes associated with successful individuals (Lord, De Vader, and Alliger 1986; Akinyele and Chen 2024). This body of work aims to understand better the traits, qualities, and behaviors that differentiate effective leaders from their counterparts. According to Horner (1997), examining these characteristics can reveal how specific individuals inspire, motivate, and influence others, ultimately contributing to successful outcomes within organizations and communities. Understanding these distinctions is crucial for developing future leaders and enhancing leadership practices (Johns 2024). Johns (2024) highlighted context's crucial role in understanding leadership theory. John noted that while there is a substantial amount of literature on leadership, much of it fails to consider the specific contexts in which leadership occurs. This oversight limits the applicability and relevance of the theories developed, suggesting a need for more nuanced approaches that consider the diverse environments and situations leaders face. By integrating context into leadership discussions, academics and managers can gain a more precise and comprehensive understanding of effective leadership practices. In a study conducted by Oc (2018), it was emphasized that various contingency theories (e.g., *path-goal theory, Fiedler's contingency model, Hersey-Blanchard situations)* of leadership significantly highlight the role of context in influencing leadership effectiveness. These theories suggest that the success of a leader is not solely dependent on their inherent qualities or behaviors but rather on how well they adapt their leadership style to the specific situational factors they encounter. This underscores the idea that understanding the context—including organizational culture, team dynamics, and external environmental factors—is crucial for effective leadership. In addition, House and Javidan (2004) provide insights into how cultural contexts shape leadership effectiveness across different societies. These studies reveal that perceptions of what constitutes effective leadership can significantly vary from one culture to another. Shondrick, Dinh, and Lord (2010) also emphasize the significance of implicit leadership theories, which are further explored by Oc (2018). Implicit leadership theories propose that followers develop their perceptions of effective leadership based on various situational factors. These factors include the dynamics of the group they are part of, such as interpersonal relationships and team cohesion, as well as the broader organizational culture, which encompasses values, norms, and practices within the workplace. By understanding these influences, we can gain deeper insights into how different environments shape followers' expectations and evaluations of their leaders. Furthermore, more contemporary approaches to leadership, categorized under *complexity leadership* (Rosenhead et al. 2019), acknowledge that interconnected and dynamic environments often shape leadership effectiveness. *Strategic leadership* (Samimi et al. 2022) emphasizes the need for leaders to adapt their strategies based on the prevailing contextual factors. Salem et al. (2019) highlight that *intergroup leadership* explores the dynamics and interactions within temporary groups. These groups, which may be formed for a specific project or goal, exhibit unique leadership challenges and opportunities (see Table 1). Understanding leadership functions in such contexts is crucial for fostering effective collaboration and achieving desired outcomes.

Table 1. Leadership styles.

Leadership Styles	Reference	Definition
Complexity Leadership	Uhl-Bien, Marion, and McKelvey (2007, 304)	"*Complexity leadership provides a framework for leaders who enable the learning, creative, and adaptive capacity of complex adaptive systems (CAS) in knowledge-producing organisations or organisational units*". Complexity leadership plays a vital role in the knowledge-based sector, which operates within complex adaptive systems. These systems are dynamic and interconnected, requiring leaders who can navigate uncertainty and change effectively. Such leaders must foster collaboration, encourage innovation, and promote a culture of learning and adaptability among their teams. By understanding the intricate relationships and emergent patterns within these systems, complexity leaders can guide organizations in developing strategies that leverage knowledge and creativity to address challenges and seize opportunities in an ever-evolving environment.
Strategic Leadership	Boal and Hooijberg (2000, p. 515)	"*Strategic leadership involves the capacity to learn, change, and managerial wisdom*". Strategic leadership is influenced by several key factors: absorptive capacity, the ability to change, and managerial wisdom. These components are shaped by various aspects, including cognitive complexity, social intelligence, and behavioral complexity. Additionally, emerging factors such as charisma, vision, and transformational leadership further moderate these influences.
Intergroup Leadership	Pittinsky and Simon (2007, p. 586)	"*Intergroup leadership encompasses various leadership styles that enable individuals in positions of authority to effectively address and manage complex challenges. This approach focuses on fostering positive relationships and collaboration among diverse groups, which can include different departments within an organization, various cultural or social groups, or even communities with differing interests*". *Intergroup leadership* involves open communication, mutual respect, and understanding. Its leaders work to create an inclusive environment where all parties feel valued and empowered. This not only helps to mitigate conflicts but also promotes cooperation and innovation, ultimately leading to more effective problem-solving and decision-making. Through these efforts, intergroup leadership plays a pivotal role in achieving shared goals and enhancing overall organizational cohesion.
Crisis Leadership	Wu et al. (2021, p. 1)	"*Crisis leadership encompasses a range of essential qualities and skills possessed by political and business leaders that enable them to navigate challenging situations effectively*". Crisis leaders must demonstrate decisiveness, clear communication, and adaptability to respond to unpredictable events and manage the associated risks. Additionally, effective crisis leaders exhibit empathy, fostering trust and collaboration among their teams and stakeholders. By leveraging these traits, they can guide their organizations or communities through turbulence, ensuring stability and resilience in the face of adversity.

Source: Prepared by the authors based on extensive review of literature.

The authors highlight the crucial role of clear communication, well-defined roles, and mutual support among group members in enhancing the overall effectiveness of a group's efforts. Effective communication ensures that all members are on the same page, enabling the smooth flow of information and reducing misunderstandings. Clearly defined roles help each member understand their responsibilities and how they contribute to the group's objectives, fostering accountability and collaboration. Mutual support cultivates a positive environment where members feel valued and empowered to contribute their unique skills.

In conclusion, based on John's (2024) and Oc (2018) discussions, we argue that recognizing context is crucial in leadership theories across various models. By understanding the specific circumstances and environments in which leadership takes place, we can gain deeper insights into how effective leadership manifests in different situations. This context awareness enables leaders to adapt their approaches and strategies, tailoring their actions to meet a group's or organization's unique needs. Ultimately, this leads to more successful outcomes. In the next section, we will discuss crisis leadership, which is the focus of our study, and how context shapes crisis leadership.

Crisis leadership

Tracy (2021) expressed in his blog posts that an individual's true leadership abilities are tested during times of crisis. Expanding on this notion, we extensively examined the existing literature on crisis leadership (Boin and Hart 2003; James, Wooten, and Dushek 2011; Bundy et al. 2017; Wu et al. 2021). Despite the available literature, the ongoing debate surrounding crisis leadership has not yielded a definitive conclusion. During times of crisis, managers must be able to manage the situation at hand effectively (James, Wooten, and Dushek 2011). This includes making critical decisions, communicating with stakeholders, and mobilizing resources to mitigate the impact of the crisis (Klebe, Felfe, and Klug 2022). Effective crisis management demands quick thinking, clear communication, and strategic decision-making to ensure the organization can navigate the challenges and successfully emerge on the other side (Klebe, Felfe, and Klug 2021; Wu et al. 2021; Dubey 2023). The study of crisis leadership has garnered attention from numerous scholars (Riggio and Newstead 2023). However, the theoretical advancement in this field is notably limited due to the sporadic nature of the research (Johns 2024). This fragmented approach has resulted in an unexplored void in the understanding of crisis leadership, highlighting the need for further comprehensive study and analysis in this area (Henderson 2024). In this study, our objective is to thoroughly analyze the capabilities of crisis leaders in effectively addressing health crises. This area of study is still in its early stages, and we aim to contribute to its development by providing a comprehensive exploration of crisis leadership. In line with Wu et al. (2021), we aim to explore various aspects of crisis leadership. The existing literature does not provide a comprehensive insight into many aspects of crisis leadership, such as (a) the effects of crises on the behaviors and perceived attributes of leaders, their leadership styles, and leadership processes, (b) the types of leader characteristics, behaviors, and leadership styles that have been most frequently examined in the crisis context, and (c) how specific levels of leaders, such as top management teams (TMT), respond to crises. We will leverage the ABV and the UET to understand crisis leadership better.

Healthcare supply chain crisis

The discipline of supply chain risk has recently attracted substantial attention due to its complexity (Bode and Wagner 2015; Flynn, Koufteros, and Lu 2016; Choi et al. 2019; Sodhi and Tang 2021b; Iftikhar et al. 2023; Xu et al. 2023; Senna et al. 2023, 2024). This field mandates a comprehensive grasp of various disciplines, including social science, political science, economics, probability theory, and organizational studies (Klassen and Vereecke 2012; Friday et al. 2018; Marques, Martins, and Araújo 2020; Tiwari et al. 2024a). Understanding these diverse areas is crucial to effectively managing and mitigating risks within the supply chain (Choi 2021a, 2021b). The COVID-19 pandemic revealed the pressing necessity to comprehend the intricacies of the healthcare supply chain crisis thoroughly (Kovács and Falagara Sigala 2021; Finkenstadt and Handfield 2023; Bag et al. 2024; Tiwari, Bryde, Stavropoulou, Dubey, et al. 2024b). While this crisis has been the subject of study for a considerable period, it drew substantial attention from diverse sectors in the wake of the global pandemic's impact on the healthcare system (Betcheva, Erhun, and Jiang 2021; Sodhi, Tang, and Willenson 2023; Dubey et al. 2023).

The supply chain crisis can stem from various causes, including natural disasters, geopolitical instability, economic downturns, and operational failures (Sharif and Irani 2012; Choi, Chiu, and Chan 2016; Mokhtar et al. 2019; Ivanov 2020; Sodhi and Tang 2021a). These issues can disrupt the flow of essential goods and services, leading to widespread impacts on businesses and consumers alike (Sodhi, Son, and Tang 2012). In the case of natural disasters, such as hurricanes, earthquakes, or floods, infrastructure damage and logistics challenges can severely hinder the movement of goods, resulting in shortages and delays (Handfield, Graham, and Burns 2020).

Similarly, geopolitical crises, such as trade disputes or conflicts, can lead to trade barriers, tariffs, or sanctions that disrupt the global supply chain (Caniato et al. 2023). As a result, businesses and consumers may experience challenges in accessing vital products and materials, underscoring the complex and interconnected nature of the modern supply chain (Choi and Shi 2024). During the COVID-19 pandemic, the healthcare supply chain experienced a crisis characterized by acute shortages of vital healthcare items, such as personal protective equipment (PPE), face masks, and various medications (Bag et al. 2023; Hossain, Thakur, and Kazancoglu 2023; Xu et al. 2024; Bag et al. 2024). These shortages significantly impacted the ability of healthcare facilities to adequately respond to the increased demand for crucial supplies, contributing to the challenges faced during the pandemic (Sodhi and Tang 2021b; Beaulieu et al. 2024). Despite its significance, the role of leadership in times of crisis has not received sufficient attention and analysis from scholars in the field of operations and supply chain management (Jia, Gong, and Brown 2019; Azadegan, Shaheen, et al. 2021; Chatterjee, Chaudhuri, and Vrontis 2024). Hence, in our research, we aim to investigate the critical role that crisis leaders play in effectively addressing the healthcare supply chain crisis.

Research method

The primary objective of this study is to address the significant gaps in the existing body of research. To achieve this, the study will formulate a theoretical framework that goes beyond testing or extending established theories (Alvesson and Sandberg 2024). This approach aims to provide a deeper understanding of the subject matter and generate new insights that contributing to the academic discourse (Duensing, Schleper, and Busse 2023; Bansal, Corley, and Devers 2024). The study will explore three specific research questions, each designed to guide the investigation and facilitate a comprehensive examination of the identified issues within the current literature (Grimm, Langley, and Reinecke 2024). This approach is motivated by the observation that previous studies in operations and supply chain management literature have not provided a comprehensive understanding of the role of leadership in effectively managing the healthcare supply chain crisis. In such a situation, scholars in the past have strongly recommended the use of an inductive theory-building approach (see Gioia, Corley, and Hamilton 2013; Narasimhan 2014; Soltani et al. 2014; Pereira, Munjal, and Nandakumar 2016; Childe 2017; Corley, Bansal, and Yu 2021; Duensing, Schleper, and Busse 2023). Qualitative research methods, such as interviews, observations, and focus groups, are highly regarded for their ability to delve into novel and complex phenomena, providing in-depth insights and understanding (Barratt, Choi, and Li 2011). According to Bansal, Smith, and Vaara (2018), these studies are instrumental in uncovering new and undiscovered perspectives, making them invaluable for gaining a deeper understanding of various research topics. Figure 1 provides a visual depiction that illustrates the step-by-step process of conducting research, encompassing elements such as formulating a research question, data collection, analysis, and conclusion.

Research design and context

To gain a comprehensive understanding of the vital role that supply chain crisis leadership plays in the healthcare sector, we conducted in-depth interviews with a diverse range of professionals and stakeholders. Our focus on the healthcare sector was driven by the notable experiences encountered during the COVID-19 crisis when many hospitals faced unprecedented challenges that tested their resilience and adaptability. Throughout the pandemic, we witnessed significant supply chain disruptions that sharply affected the availability of essential healthcare items, such as personal protective equipment (PPE), ventilators, medications, and other critical supplies (Queiroz, Ivanov, et al. 2022; Tiwari et al. 2024a; Queiroz and Fosso Wamba 2021). These shortages not only posed risks to

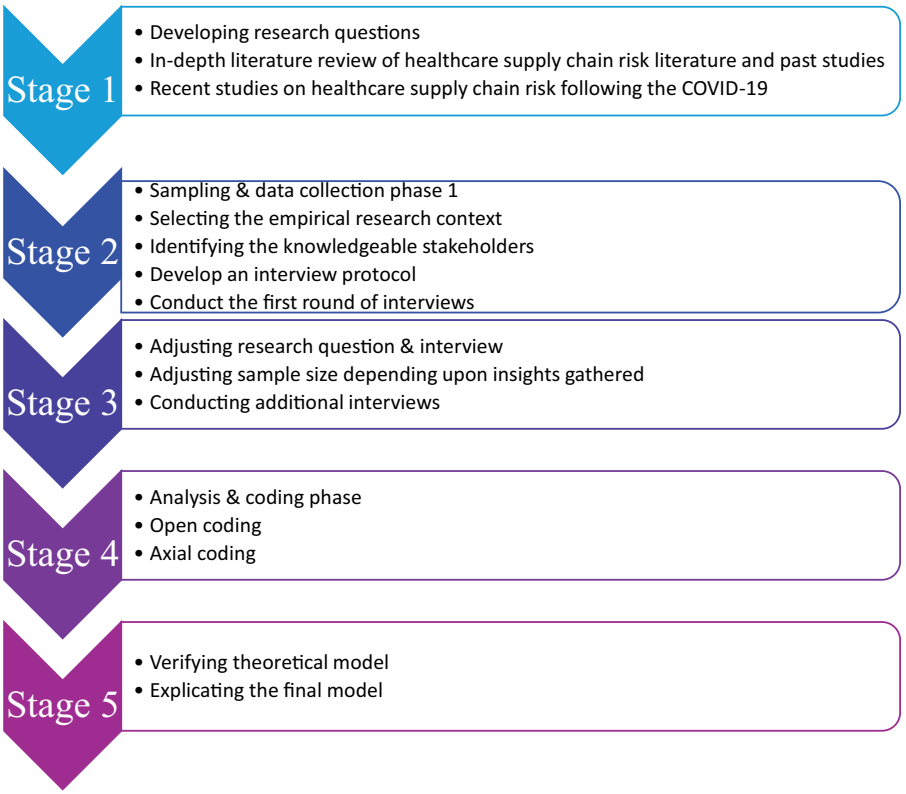

Figure 1. Overview of the research process.

healthcare workers and patients but also severely constrained hospitals' capacity to provide care (Queiroz, Wamba, et al. 2022). As hospitals experienced an exponential rise in COVID-19 cases, they were forced to confront urgent resource limitations, including inadequate space and staffing to accommodate the influx of patients (Queiroz, Fosso Wamba, and Branski 2022). The complexity of these challenges highlighted the necessity for effective crisis leadership within healthcare organizations (Bailey and Breslin 2021). We sought to explore how crisis leaders implemented strategies to mitigate supply chain issues, coordinate with suppliers, and adapt operational processes in real time to respond to the rapidly evolving situation conducted a series of qualitative interviews involving 33 participants drawn from a diverse range of departments within hospitals, healthcare centers, and affiliated organizations. These participants included healthcare professionals, administrators, and key stakeholders who played crucial roles throughout the COVID-19 pandemic. Our primary objective was to gain a deeper understanding of the decision-making processes and communication strategies implemented by crisis leaders during this unprecedented time. Specifically, we sought to explore how these leaders developed and executed innovative solutions while facing significant challenges to maintain the continuity of care for patients. Through these insights, we hoped to highlight best practices and lessons learned that contributed to effective healthcare delivery in a crisis situation, ultimately benefiting both current and future healthcare operations (Carter, Meschnig, and Kaufmann 2015). The interviews were specifically tailored to delve into the experiences and perspectives of those directly managing the challenges presented by the COVID-19 crisis at the time of the study. By engaging with individuals with firsthand experience dealing with the crisis, we aimed to gain a holistic and multi-faceted perspective on crisis leadership and management in the healthcare sector (Carter, Meschnig, and Kaufmann 2015; Al Owad et al. 2018; Spieske et al. 2022). In this study, we relied on qualitative data gathered through semi-structured interviews as a crucial part of the data collection process (Conlon

et al. 2020). We gathered valuable insights from senior-level staff members tasked with overseeing the administration of healthcare centers, healthcare professionals, and procurement staff responsible for managing the supply of personal protective equipment (PPE), medicines, and other necessary items. These individuals possessed significant expertise in confronting the challenges posed by the recent COVID-19 crisis.

Data collection

To thoroughly understand top leaders' behavior, decision-making processes, and actions during health crises, we aimed to explore how their behaviors and decision-making capabilities impact the healthcare supply chain in these challenging times (Sriharan et al. 2022). To achieve this, we collected extensive experiences and insights from various healthcare centers, hospitals, and key stakeholders who were instrumental during the COVID-19 pandemic (Gleibs 2024). This research involved analyzing the approaches leaders took in developing and developed countries, focusing on the strategies they implemented, their challenges, and the outcomes of their decisions. By examining these real-world experiences, we hope to shed light on best practices and lessons learned that can inform future responses to health crises (Conlon et al. 2020).

Although there is no universally accepted standard for determining the appropriate sample size in qualitative research, we decided to proceed with our interviews until we felt confident in the richness of the data we collected (Duensing, Schleper, and Busse 2023). This led us to a stage known as theoretical saturation, where we observed that new interviews no longer yield significantly different insights or themes (Wutich, Beresford, and Bernard 2024). This approach ensured our findings were well-grounded and reflected the participants' perspectives.

In the initial sampling phase, we compiled a comprehensive list of 65 healthcare entities, including hospitals, healthcare centers, and research facilities equipped with full medical services capable of treating patients. We also included various government healthcare departments that play a vital role in public health. This list was meticulously developed through extensive desk research, which involved reviewing existing directories and databases and leveraging personal contacts within the healthcare industry (Bhakoo and Choi 2013). To enhance our outreach, we actively sought referrals from participants involved in our study, which allowed us to connect with additional organizations that may not have been included in our original list. This multi-faceted approach ensured that we covered a broad spectrum of facilities, thereby enriching our sampling framework for more robust data collection (Corbin and Strauss 1990; Wutich, Beresford, and Bernard 2024). We finally identified 33 participants (Table 2), to gain comprehensive insights into various aspects of organizational processes within the healthcare sector. Our aim was to understand how healthcare leaders navigated challenges during the pandemic, as well as to identify the vulnerabilities in the healthcare supply chain that emerged during this period of unprecedented crisis and turmoil. By examining these elements, we aimed to illuminate the critical factors that influenced decision-making and operations in healthcare during these trying times.

For this study, we conducted a comprehensive analysis involving 33 interviews with representatives from 26 distinct organizations (refer to Table 2 for details). Each participant willingly agreed to participate in the interviews under strict confidentiality and anonymity, ensuring their identities and potentially sensitive information would remain protected (Saunders, Kitzinger, and Kitzinger 2015). Given the delicate nature of the data shared during these discussions, we have opted to present only non-identifiable information to safeguard the participants' privacy while still conveying the essential findings of our research. The study was initiated in September 2023 and concluded in August 2024. Throughout this period, interviews were conducted based on semi-structured guidelines (see Appendix A), allowing consistency and flexibility in responses. The interview questions focused on several key areas: the characteristics of effective leadership,

Table 2. Participant demographic profile.

Type of Organization	Designation of the participant	Interview duration
Research Center	Senior Scientist (P1)	32 min 36 s
Private Hospital	OPD (P2)	43 min 12 s
Private Hospital	CMO (P3)	31 min 18 s
Government Hospital	Director (P4)	49 min 13 s
Private Healthcare Center	Surgeon & Head (P5)	37 min 23 s
University Hospital(A)	CMO (P6)	43 min 11 s
University Hospital (A)	Professor (P7)	51 min 13 s
University Hospital (A)	Professor (P8)	34 min 12 s
University Hospital (B)	CMO (P9)	39 min 16 s
Government Hospital	CMO (P10)	31 min 46 s
University Hospital (C)	Surgeon & Head (P11)	57 min 12 s
University Hospital (C)	Professor (P12)	39 min 16 s
University Hospital (D)	Professor (P13)	41 min 13 s
University Hospital (E)	OPD (P14)	29 min 39 s
University Hospital (F)	OPD (P15)	34 min 11 s
University Hospital (G)	OPD (P16)	57 min 13 s
Private Hospital	Admin's head (P17)	33 min 09 s
University Hospital	Procurement Incharge (P18)	47 min 18 s
Ministry of Health and Family Welfare	Civil Servant (Secretary) (P19)	55 min 07 s
Government Hospital (H)	OPD (P20)	31 min 13 s
Government Healthcare Center	Staff Nurse (P21)	47 min 19 s
Private Hospital	Staff Nurse (P22)	38 min 14 s
Research Center	OPD (P23)	39 min 17 s
Private Hospital	Procurement Incharge (P24)	28 min 53 s
Research Center	Consultant (P25)	44 min 11 s
NGO	Consultant (P26)	53 min 06 s
Private Healthcare Center	Surgeon & Head (P27)	56 min 05 s
University Hospital (I)	Professor (P28)	47 min 03 s
University Hospital (I)	Professor (P29)	33 min 08 s
University Hospital (I)	Professor (P30)	39 min 07 s
University Hospital (I)	Professor (P31)	41 min 11 s
University Hospital (I)	Professor (P32)	55 min 03 s
University Hospital (I)	Professor (P33)	57 min 09 s

the decision-making capabilities of leaders during times of crisis, and the vulnerabilities that exist within the healthcare supply chain, particularly in the context of a pandemic.

To ensure the validity and reliability of our research findings, we implemented a triangulation approach, as outlined by Ahmed (2024) and Lim (2024). This strategy involved cross-referencing our collected data with a variety of reports and scholarly articles published in reputable magazines and academic journals. By engaging with this diverse array of sources, we sought to strengthen the robustness of our conclusions and to provide a more comprehensive understanding of the subject matter under investigation. In our study, we adopted a detailed three-pronged approach (data triangulation, investigator triangulation, and theory triangulation), to triangulate the data effectively (Beecham et al. 2018). Firstly, we conducted qualitative interviews with participants to gather rich, in-depth insights. Following the collection of these interviews, we took an additional step to validate the information by comparing it against official records and documents. This process was crucial, as it allowed us to identify any discrepancies between the accounts provided by participants and the existing documented evidence. In cases where inconsistencies arose, we made the decision to omit the conflicting data from our analysis to maintain clarity and avoid potential confusion or misinterpretation of our findings. This careful approach aimed to enhance the credibility of our research and ensure that our conclusions were well-supported and accurate.

Data analysis and coding

In our study, we adhered to the recommendations of Gioia, Corley, and Hamilton (2013) to construct a theory from our data, aligning with similar research in supply chain management

(Bansal, Gualandris, and Kim 2020; Duensing, Schleper, and Busse 2023). Gioia, Corley, and Hamilton (2013) offer valuable insights that have significantly aided us in establishing a strong foundation for conducting a thorough analysis of qualitative data to develop a robust theory. Gioia, Corley, and Hamilton (2013) emphasize the importance of an interpretivism philosophy, a practical framework for comprehensively understanding participants' experiences regarding a specific phenomenon. By focusing on these experiential insights, we can construct a well-informed theory that reflects the complexities of their lived realities (Linneberg and Korsgaard 2019). This approach enriches our analysis and enhances the overall depth and rigor of our findings (Grodal, Anteby, and Holm 2021).

Per the methodologies proposed by Gioia, Corley, and Hamilton (2013), we implemented several key adjustments throughout our research process, particularly in the data collection and analysis phases. During the data collection phase, we sought out new participants to broaden our sample size and enrich the diversity of perspectives gathered. This allowed us to delve deeper into the experiences and insights of various individuals related to our research topic. We meticulously examined the interview statements in the subsequent data analysis phase to identify and categorize emerging concepts. We focused on delineating these concepts to highlight their significance and relevance to our study, ensuring that each insight was thoroughly analyzed and contextualized within the broader framework of our research objectives (Bansal, Gualandris, and Kim 2020).

Throughout our research, we made multiple adjustments to our coding framework to better align with the evolving insights and findings (Locke, Feldman, and Golden-Biddle 2022). In the initial stages, our primary objective was to systematically collect data from the participants. Following this collection, we undertook a comprehensive comparison of the ideas presented by all participants to identify common themes and differences (Locke, Feldman, and Golden-Biddle 2022). This iterative process ensured that our analysis remained responsive to the nuances of the data as it emerged. Initially, we conducted a thorough analysis of the interview transcripts to identify common themes and patterns regarding the participants' experiences with their leaders (Corbin and Strauss 1990; Locke, Feldman, and Golden-Biddle 2022). We focused on their perceptions of the leaders' behaviors, decision-making styles, and the overall effectiveness of their leadership during the pandemic. We specifically examined these leaders' actions to tackle significant supply disruptions that arose during this crisis. These disruptions were critical, as they directly impacted the availability of essential items such as personal protective equipment (PPE), medicinal supplies, oxygen cylinders, and other vital resources. By analyzing these aspects, we aimed to gain deeper insights into how leadership strategies influenced the ability to respond to urgent healthcare challenges during the pandemic. Following the interview guidelines, we meticulously gathered excerpts illuminating how the organization directed its attention during periods of crisis. We aimed to explore leaders' strategies to effectively manage the organization's attention in these challenging situations. The extracts provide valuable insights into decision-making processes, communication techniques, and the overall approach leaders took to ensure that the organization remained resilient and responsive amidst adversity. Through this analysis, we seek to understand leadership dynamics and organizational behavior during critical times. This process enabled us to connect our guiding research questions and the corresponding data and analysis. We focused intently on the specific extracts from the data linked to each research question. By doing so, we aimed to enhance our understanding and interpretation of the findings, ensuring that the insights derived from the data were directly relevant to the questions we sought to answer (Pratt 2009). This meticulous approach allowed for a more nuanced analysis and strengthened the overall validity of our research. In alignment with findings from various studies, such as those conducted by Kaufmann and Denk (2011), Bansal, Gualandris, and Kim (2020), and Duensing, Schleper, and Busse (2023), we employed axial coding as part of our research methodology. The use of ATLAS facilitated this process. Ti software is complemented by AI tools to enhance data analysis and interpretation. The integration of these technologies makes ATLAS. Ti is a highly suitable choice for academic research. Furthermore, it is important to note that

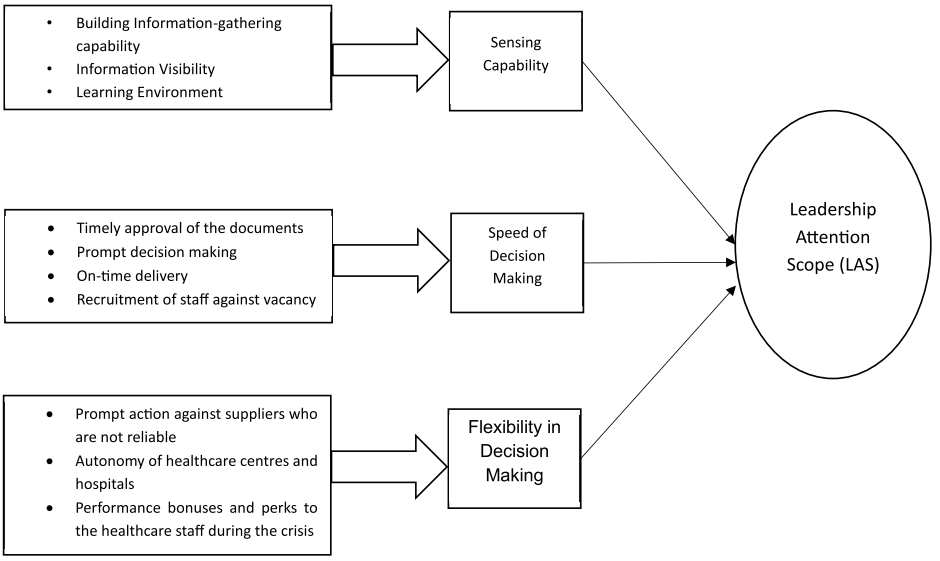

Figure 2. Data structure for Leadership Attention Scope.

other software options, such as MAXQDA (as referenced by Duensing, Schleper, and Busse 2023) and NVivo (highlighted in Singh, Shukla, and Mishra 2018), have also been widely adopted by researchers in the academic community. Each software has unique features and strengths, making them popular choices for qualitative analysis among scholars seeking robust and effective methods for coding and analyzing their data. We developed a first-order concept (Figure 2) by drawing from the participants' experiences. Many participants highlighted challenges concerning their ability to sense changes in their environment and react swiftly to internal and external dynamics. These insights formed the foundation for our analysis.

In the next stage, we developed second-order themes and aggregate dimensions, following the framework established by Gioia, Corley, and Hamilton (2013). This process involved thoroughly examining the participants' narratives and experiences, allowing us to identify recurring themes and patterns. Additionally, we integrated relevant literature on supply chain resilience into our theoretical development. This literature served as a vital resource for refining and elevating our model to more abstract conceptual dimensions.

Our extensive data analysis resulted in a complex data structure, which, after 17 iterations, culminated in a robust final model. This model illustrates how effective crisis leadership during turbulent times is crucial for navigating supply chain disruptions. It also emphasizes the role of such leadership in fostering supply chain resilience in response to health crises. This comprehensive approach aims to contribute valuable insights into the interplay between leadership, crisis management, and supply chain dynamics.

Research findings

Our analysis identified three key aggregate dimensions: Leadership Attention Scope, Crisis Leadership, and Mitigation of Supply Chain Disruptions, as illustrated in Figures 2–4 respectively. Each dimension is critical in understanding how effective leadership can navigate challenges and ensure operational resilience. Following the framework proposed by Gioia, Corley, and Hamilton (2013), we have integrated these aggregate dimensions into a grounded model to enhance our understanding of the interrelationships among leadership practices and their effects on organizational resilience.

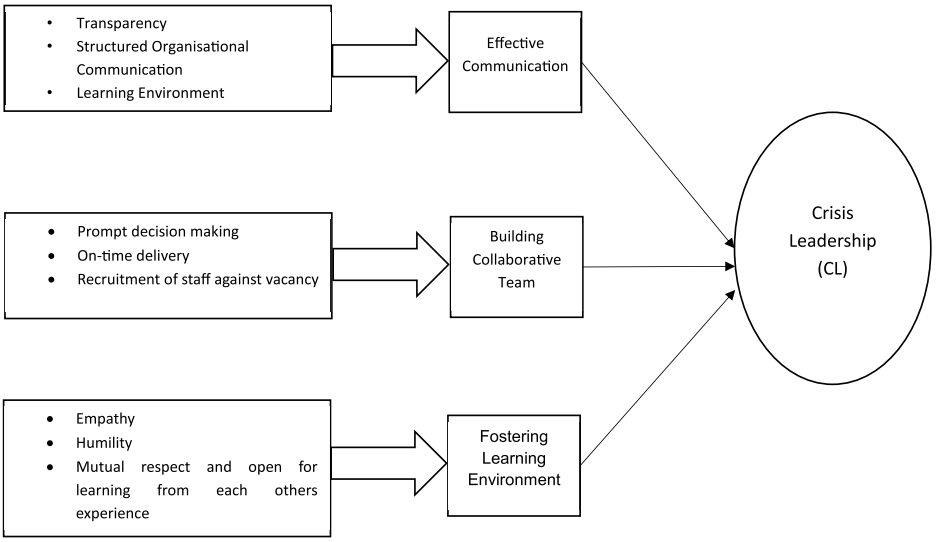

Figure 3. Data structure for Crisis Leadership (CL).

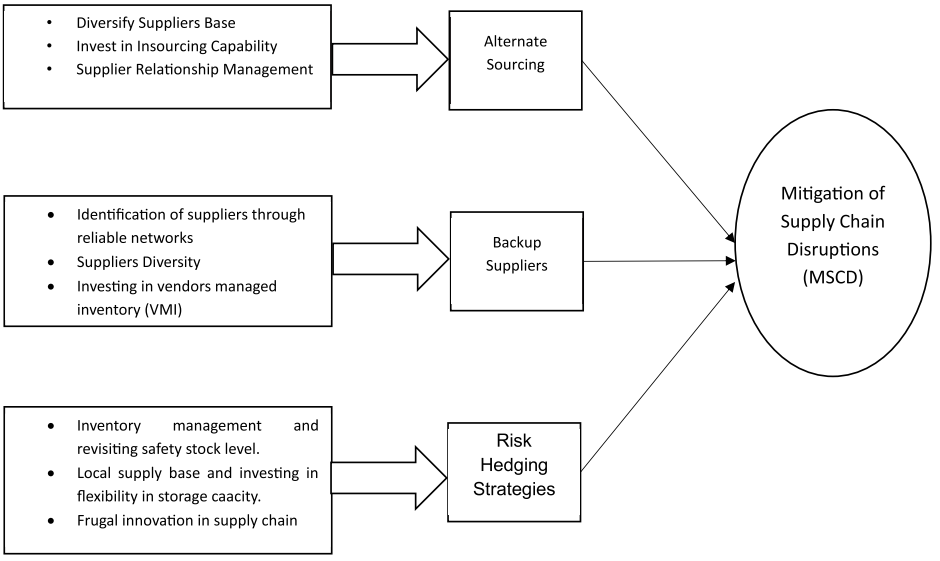

Figure 4. Data structure for Mitigation of Supply Chain Disruptions (MSCD).

Leadership Attention Scope (LAS)

LAS refers to the focus and priorities of leaders during times of uncertainty (Mokhtar et al. 2019; Kull et al. 2019). This dimension examines how leaders allocate attention to various organizational challenges, impacting overall decision-making processes (Zheng, Liu, and Gong 2016; Chen et al. 2021). Based on Table 3, three-order themes emerged from our qualitative data, which refer to the leaders' attention, which are generally psychological factors that reflect the organizational strategies (Hambrick and Mason 1984): sensing, *speed and flexibility*. These three second-order themes reflect the leaders' attention and are often regarded as the mix of leaders' ability to interpret the issues and socio-emotional information (Smith and Tushman 2005). We further illustrate each of the second-order themes in greater detail (refer to Figure 2).

Table 3. Leadership Attention Scope (LAS).

Coding	Quotes of the Participant
Sensing	In a dynamic environment, we are faced with a high level of uncertainties resulting from trade wars, geopolitical tension and the disasters resulting from the nature and the health crises such as Ebola, or COVID-19 reminds us that the organization needs to develop a mechanism to capture the information which is important for decision making. Unfortunately, our country leaders or heads of the organizations do not pay much attention to building information sourcing ability. [P13]
	…. I raised my concerns that we do not have a proper mechanism to track the flow of materials or information, but the higher authorities have not paid much attention to my voice …. The organization's top boss did not pay much attention to my voice …. [P18]
	… we lack the learning ability as in 2017 we had faced a similar situation. In one of the hospitals, we saw severe casualties leading to the death of newborn babies due to the shortages of oxygen cylinders. However, the matter was buried as time passed, and we faced a similar situation during the pandemic. If we had fixed our root problems, we could have saved many lives …. [P28]
Speed	I am more concerned about the action on time. I and my team members alerted me on time that we were running out of stock of necessary equipment and medicine. However, the approval process is so lengthy, and higher authority delayed the purchase requisition […] after that we faced acute shortages of PPEs, medicine and ran out of bed. [P24]
	We could have avoided the negative consequences of the pandemic if the hospital administration had made a decision on time. We lacked protective equipment such as caps, goggles, and N95 face masks. We were managing using available resources which were not safe. [P21]
	I have told my seniors multiple times that our suppliers often do not adhere to their committed times. We should change the suppliers and select more reliable suppliers in case of critical healthcare items. However, no action was taken. We faced a severe crisis during the pandemic due to supplier failure to deliver PPEs on time, putting all of us in a state of helplessness. [P16]
	I have sent requests multiple times to the secretary of the Ministry of Health to fill the vacant positions. We now face acute shortages of qualified, trained staff for critical cases. We cannot operate like this with our trainee. We could have avoided the crisis during the pandemic if the government had paid attention to our request for staff recruitment. [P10]
Flexibility in decision-making	We could have tackled the situation (pandemic crisis) far more efficiently and effectively if we would have been slightly open for the adjustment in terms of suppliers selection and staff selection to respond to the immediate needs of the time. [P1]
	I believe that making decisions in government-managed hospitals is challenging, and often, we try to avoid controversies. We need to operate within rigid boundaries, and thus, decision-making on time, related to the appointment of staff or selection of suppliers, becomes challenging to avoid controversies. I know it is demoralizing sometimes, but we lack much freedom on several fronts. [P4]
	I offered bonuses and additional allowances to our staff during the pandemic to motivate them to work in extremely challenging times. I also convinced my governing body to clear the pending bills to motivate our critical item suppliers. [P3]
	I recommended that the Secretary of the Ministry of Health consider allowing graduates of alternative medicine and other support staff with basic knowledge of medicine and procedures to assist healthcare centers and hospitals in addressing the significant shortages of medical professionals during times of crisis. [P26]

Sensing capability

External environments are vital in offering managers crucial information that enables them to assess various situations, particularly concerning risk identification and exploring external opportunities (Jansen, Vera, and Crossan 2009; Oc 2018). Managers adept at interpreting these external signals can better navigate challenges and recognize potential benefits (Hodgkinson and Healey 2011). This critical skill, often called dynamic sensing capability, allows leaders to remain agile and responsive in the face of turbulence and rapid shifts in their operating environments (Bacha and Niesten 2024). By developing this capability, leaders can make informed decisions that enhance organizational resilience and strategically position their organizations for success in an ever-changing landscape (Napier, Liu, and Liu 2024). The leaders possess a keen sensing ability to accurately identify and assess emerging organizational challenges (Day et al. 2014). This skill helps them address issues effectively and is crucial in cultivating an environment conducive to continuous learning and development. By fostering open communication and promoting a growth mindset, the team creates an environment where members feel empowered to explore new ideas and learn from their successes and failures. Participants P13, P18, and P28 emphasized the

importance of developing the ability to *source accurate information*, enhancing *visibility* and *transparency*, and cultivating a *learning environment* to improve dynamic sensing capabilities.

Speed of decision making

Through our in-depth interviews with various participants, we understood that the ability to make rapid decisions and adapt to dynamically changing circumstances is not just beneficial but crucial during periods of crisis (Maitlis and Sonenshein 2010). Participants stressed that timely decision-making could significantly impact outcomes—in many cases, it can determine whether a situation worsens or can be managed effectively (Hess et al. 2015). Moreover, responsiveness is vital for organizations aiming to navigate through uncertainty more successfully. This critical insight underscores the importance of robust and effective communication practices and flexibility when confronting high-stakes situations (Ortiz-Barrios et al. 2020). Both factors can ultimately dictate the success or failure of crisis management initiatives. Participant P24 expressed significant concerns about the frequent delays in approving purchase requisitions. These delays adversely affected the availability of essential healthcare items, creating a bottleneck that hampered effective patient care. Similarly, Participant P21 highlighted issues related to the sluggish approach to procuring necessary healthcare supplies, which severely exacerbated the supply chain problems witnessed during the pandemic. Additionally, Participant P16 raised alarming concerns regarding the reliability of key suppliers. This unreliability impacted inventory levels and significantly diminished the quality of services provided by hospitals and healthcare centers, ultimately affecting the lives of the COVID-affected patients. Furthermore, Participant P10 discussed delays in the recruitment process for healthcare staff, which resulted in acute staffing shortages. These shortages introduced considerable challenges, particularly during the pandemic's peak, when the demand for healthcare services surged. Collectively, these issues underscore an urgent need for top managers and organizational leaders to enhance the speed and efficiency of their decision-making processes. Improving responsiveness at the management level will directly and positively affect the healthcare supply chain, ultimately leading to better patient care and more effective crisis management.

Flexibility in decision making

Through our interviews with participants, we found that the ability to adapt decision-making processes during a crisis is essential. The participants emphasized that flexibility allows organizations to respond more effectively to rapidly changing circumstances, enabling them to address urgent challenges and seize emerging opportunities. This adaptability in the decision-making capabilities of senior leaders and managers enhances the effectiveness of their responses and fosters a proactive approach to managing uncertainty and risk (Smith 2014). Participant P1 highlighted the necessity of flexibility in supplier selection and recruitment during times of crisis or turbulence, which can help tackle adverse situations effectively and efficiently. Additionally, Participant P4 expressed the need for greater autonomy in publicly managed hospitals and healthcare centers to facilitate quick decision-making. Participant P3 discussed the practices of privately owned hospitals that allow them to offer additional perks and bonuses to their healthcare staff during crises, motivating them to work in highly challenging environments. Finally, Participant P26 noted the importance of flexible policies that accommodate alternative medicine degree holders or medical technologists to address staffing shortages during emergencies. Therefore, flexibility in decision-making during crises is of critical importance.

Crisis leadership (CL)

CL encompasses the various strategies and approaches leaders employ to effectively respond to immediate and pressing crises (Dubey 2023; Riggio and Newstead 2023). This concept underlines

Table 4. Crisis Leadership (CL).

Coding	Quotes of the Participant
Effective Communication	I expect my organization and the directors to share accurate information in times of crisis. We work under constant pressure, and information asymmetry creates much confusion. [P27]
	I felt lost during the COVID-19 pandemic. We received no communication from our line managers about the situation. We lived in constant fear and were overwhelmed by the rising COVID-19 cases, with our resources being minimal. [P22]
	During the pandemic, I noticed that the healthcare staff felt confused and depressed. We were navigating an unprecedented situation for the first time, and the news we consumed from social media was overwhelming. Our leaders and senior management could have communicated with us more effectively. We were all feeling low and anxious. Our families at home were also under extreme stress due to the nature of the virus, and we did not feel safe either.[P29]
Building Collaborative Team	We could have better addressed the pandemic crisis by building trust among stakeholders. In most cases, each party blamed the others, which further worsened the situation. [P25]
	I believe the crisis tests our character. I was shocked to see that the blame game has escalated to the next level. Some colleagues have used this situation as an opportunity to gain authority and eliminate their opponents. For the first time, I witnessed qualified medical professionals behaving like a beast. We seem to have forgotten our original goal, and we could have handled this crisis much more effectively. [P32]
	In the initial days, we were not sharing information freely. We were under extreme stress due to a lack of support from society and the government. Many of our colleagues even faced discrimination from the public, as people believed we were spreading the virus. We felt isolated and, for the first time, regretted choosing this noble profession. [P31]
Fostering learning environment	I believe the pandemic has taught valuable lessons to all of us. Through this challenging time, I have understood that while every good thing eventually reaches its conclusion, the same holds for the difficult periods we face. This realization has been humbling and enlightening (empathetic toward others). [P 19]
	… I hope we can be empathetic to one another. COVID-19 has taught us the importance of caring for each other's emotions. …. [P12]
	During these tough times, we are often forced to reflect on our lives and our relationships with others. I have learned that hardship can teach us resilience and the importance of gratitude. It encourages us to be humble, recognizing that our circumstances can change in an instant. Moreover, this experience has highlighted the significance of showing respect and compassion toward one another, as we all navigate our own struggles. Ultimately, these lessons have fostered a deeper sense of empathy and connection among us. [P17]
	We need to remain humble during difficult times. Seniors should respect their colleagues, as we are all facing this situation for the first time. Humility is the best way to address the confusion and fear we are experiencing right now. [P33]
	I believe in fostering a culture of mutual respect where we can share our expertise and ideas freely. We should minimize the fear of failure, as this encourages us to grow and work better together, especially during challenging times.[P5]

the critical importance of having decisive and adaptable leaders, as these qualities are essential for navigating organizations through significant disruption and uncertainty. Effective crisis leadership not only facilitates the immediate survival of an organization but also lays the groundwork for potential recovery and sustainable long-term growth (Azadegan, Shaheen, et al. 2021). Our research findings identify three key themes that capture the behavioral aspects of leadership during crises (see Table 4). These themes set crisis leadership apart from other leadership styles by highlighting the specific actions and mindsets required to address disruptions effectively, particularly in the context of the healthcare supply chain. The themes are *effective communication*, *building collaborative teams* and *fostering a learning environment*. By focusing on these three themes, leaders can more effectively manage the complexities and disruptions inherent in crises, particularly in the healthcare sector. Next, we will illustrate these three themes based on the participants' interviews.

Effective communication

Effective communication during a crisis is essential for conveying critical information clearly and promptly, ensuring that all stakeholders are informed and aligned (Coombs and Holladay 1996).

Leaders who excel in communication can reduce misunderstandings and build trust, which is crucial for team cohesion. Participant P27 emphasized the importance of sharing accurate information in challenging times. Participant P22 also reflected on the significance of communicating individually during these difficulties. Participant P29 noted that addressing rumors and providing support through clear communication can help manage uncertainties and emotional stress during a crisis. Overall, effective communication is significantly important in times of crisis.

Building collaborative teams

Successful crisis leadership involves forming collaborative teams that can work together seamlessly (Waugh and Streib 2006). This theme emphasizes the importance of fostering a culture of teamwork and open dialogue among team members, which enhances problem-solving capabilities and encourages innovative solutions during high-pressure situations. Participant P25 highlighted the significance of building trust among team members and stakeholders in times of crisis. P32 pointed out that opportunistic behavior can undermine collaborative efforts during such times. Additionally, Participant P31 emphasized the importance of information sharing, which helps reduce behavioral uncertainties and promotes collaboration. Overall, the ability to initiate collaboration is a crucial trait for leaders in times of crisis.

Fostering a learning environment

Crisis scenarios often serve as significant opportunities for learning and growth within organizations, as noted by Boin and Hart (2003). In these challenging times, it is crucial for leaders to cultivate an environment that encourages team members to open up about their experiences, share valuable insights, reflect on the difficulties they face, and collaboratively develop innovative strategies to address ongoing challenges. By promoting a culture of continuous learning, organizations not only enhance their immediate response capabilities but also fortify their resilience against potential future crises. For instance, Participant P19 highlighted the lessons learned during the recent crisis, expressing confidence that these insights will prove beneficial in managing future crises more effectively. This reflection underscores the importance of taking lessons from past experiences to inform future actions. Meanwhile, Participant P17 expanded on the theme of mutual learning, stressing the significance of embracing humility and empathy during times of crisis. They emphasized that recognizing our shared vulnerabilities can foster stronger connections among team members, ultimately leading to more effective collaboration and support. Furthermore, Participant P5 advocated for the establishment of a robust continuous learning culture within the organization. They argued that fostering an environment where skills and knowledge acquired during crises are shared and exchanged can enhance the overall competency of the team and prepare them more effectively for unforeseen challenges. By implementing such a culture, organizations can ensure that the lessons learned during crises are preserved and utilized to strengthen future responses.

Mitigation of Supply Chain Disruptions (MSCD)

Mitigation of Supply Chain Disruptions (MSCD) encompasses proactive and reactive strategies designed to lessen the effects of unforeseen disruptions within the supply chain (Azadegan, Modi, et al. 2021). These disruptions can arise from various factors, including natural disasters, geopolitical tensions, or unexpected demand fluctuations, making effective mitigation essential for operational stability (Falagara Sigala et al. 2022). This concept underscores the critical need for comprehensive strategic planning and the development of flexible operational frameworks. Such frameworks enable organizations to adapt quickly to changing circumstances, ensuring continuity and efficiency throughout their supply chains (Kamalahmadi and Parast 2017). Each of these themes plays a vital role in creating a robust supply chain that can weather unexpected challenges

Table 5. Mitigation of Supply Chain Disruptions (MSCD).

Coding	Quotes of the Participant
Alternate Sourcing	In today's competitive environment and amidst geopolitical crises, it is crucial to identify alternative sourcing options. During the pandemic, we experienced shortages of raw materials due to our reliance on a limited number of suppliers. This has taught us an important lesson. We need to develop alternative sourcing strategies to prevent supply disruptions. [P18]
	We are currently exploring the option of developing our local suppliers to enhance our supply chain resilience. Our heavy dependence on suppliers located in China and other international markets has raised concerns, especially in light of recent geopolitical tensions. These tensions have shown us that such reliance can lead to significant disruptions, as we experienced during the pandemic, which affected our production capabilities. By investing in our local suppliers, we aim to mitigate these risks and ensure a more stable and efficient supply chain moving forward. [P19]
	… We need to improve our insourcing capabilities to avoid embarrassment … [P7]
	It is essential for us to enhance and solidify our relationship with our trusted suppliers. By fostering stronger ties and maintaining open lines of communication, we can ensure that we will be able to count on their support and resources during times of crisis. This collaboration will not only strengthen our supply chain but also help us navigate challenges more effectively together. [P23]
Backup Suppliers	It is essential to establish a diverse network of suppliers for each healthcare item we require. Over-reliance on a limited number of suppliers poses significant risks, particularly during times of crisis. By having multiple suppliers, we can ensure a more stable and reliable supply chain, reducing the likelihood of shortages and improving our ability to respond effectively when unexpected challenges arise. [P2]
	I suggest that our senior officials review the supplier selection process, as it remains unclear and requires immediate attention. [P14]
	We should ensure that we engage a diverse range of suppliers from various countries for every critical item we need. This approach will not only strengthen our sourcing strategy but also reduce the risks associated with relying on a single supplier or region, ultimately promoting a more resilient supply chain. Additionally, we must place a greater emphasis on supplier diversity, which has not been given the attention it deserves. [P6]
	….to effectively address challenges like those we encountered during the pandemic, it is essential that we adopt strategies from other industries, particularly the automotive sector. One such strategy is Vendor Managed Inventory (VMI), a system that allows suppliers to take responsibility for managing inventory levels. By implementing VMI in healthcare, we can improve our supply chain efficiency, reduce stockouts, and ensure that critical medical supplies are available when needed most. While I may not be an expert in supply chain management, I believe that learning from the successful practices of other industries, like automotive manufacturing, could greatly enhance our preparedness for future crises in the healthcare sector …. [P11]
Risk-hedging strategies	We need to prioritize the development of an inventory of essential health items to better prepare for and respond to emergencies, similar to the challenges we faced during the pandemic. This involves not only increasing our stock but also implementing effective management strategies. However, the task is complicated by the fact that the products we deal with have varied life cycles, which makes forecasting demand and ensuring items are used before expiration difficult. In contrast to other commercial sectors, where products may have more predictable turnover, the healthcare sector presents specific challenges that require careful planning and coordination to ensure we can meet urgent needs effectively.[P9]
	… we must focus on strengthening our local suppliers and enhancing our manufacturing capabilities to ensure greater resilience […] during crises such as the pandemic, accurate forecasting becomes extremely challenging, as we have encountered circumstances that are entirely unique and unprecedented in nature. By investing in local supply chains and manufacturing, we can reduce our dependence on external resources and better prepare for future disruptions, ultimately leading to a more stable and self-sufficient economy … [P18]
	I recommend using 'jugaad' during crises like these. My team and I managed to navigate the early days of the pandemic by optimally utilizing all the resources available to us. While I do not endorse such practices, it was our only option during this extreme situation. [P30]

while continuing to meet customer demands (Handfield et al. 2024). In our analysis, as illustrated in Table 5, three primary themes emerged from the empirical data collected. We discuss each one of them in detail.

Alternate sourcing

Alternate sourcing involves the comprehensive process of identifying, evaluating, and establishing relationships with multiple suppliers for essential materials or components. This strategy

empowers businesses to swiftly adapt when one supplier becomes unavailable, thereby minimizing potential disruptions. Participant P18 underscored the critical need to expand the supplier base, acknowledging that an overreliance on a limited number of suppliers during periods of uncertainty and volatility can pose serious threats. They pointed out that such dependency can lead to significant operational risks, including service delays, increased costs, and loss of market competitiveness. Participant P19 further stressed the urgency of diversifying sourcing options beyond China. P19 explained that during the pandemic, the heavy reliance on Chinese suppliers not only created logistical challenges but also exposed vulnerabilities that weakened the country's geopolitical standing. By seeking alternative suppliers in various regions, businesses can enhance their resilience against similar future crises.

Moreover, Participant P23 highlighted the importance of effective supplier relationship management as a strategic approach to navigating crises. P23 further emphasized that building strong, collaborative partnerships with a diverse range of suppliers can lead to better communication, increased flexibility, and improved problem-solving capabilities during challenging times. Based on the participants' reflections, adopting alternative sourcing strategies is an essential and proactive method for mitigating supply chain disruptions and ensuring long-term operational stability.

Backup suppliers

Organizations can significantly mitigate the risk in the healthcare sector by maintaining a comprehensive list of backup suppliers. This strategy allows organizations to quickly pivot and secure alternative sources in the event of disruptions with their primary suppliers, ultimately ensuring a more reliable supply chain. Participant P2 highlighted the critical need for healthcare organizations to establish relationships with multiple suppliers for each healthcare item. This approach is essential in mitigating the risks associated with over-dependence on a single supplier, particularly during crises where supply chain interruptions are common. By having a diverse supplier base, companies can better navigate challenges and maintain the uninterrupted flow of necessary goods and services. Furthermore, Participant P6 advocated for the exploration of suppliers from various countries. This expansion of the supplier network can be particularly beneficial in times of geopolitical tensions, which can disrupt supply chains. By diversifying geographical sources, companies can reduce their vulnerability to localized disruptions and enhance their ability to respond to global challenges. Additionally, Participant P11 recommended that healthcare organizations look to adopt best practices from other industries, such as vendor-managed inventory (VMI) systems used in the automotive sector. Implementing VMI can lead to greater efficiency in managing supplies, as it allows suppliers to oversee inventory levels and replenish stock as needed. This proactive approach can be invaluable in addressing supply disruptions during unprecedented crises, such as pandemics or other significant global health emergencies. In summary, a multifaceted strategy involving backup suppliers, geographic diversification, and the adoption of industry best practices can empower companies to maintain supply chain integrity during challenging times.

Risk-hedging strategies

Implementing effective strategies to mitigate potential risks in supply chains requires a comprehensive approach, encompassing robust inventory management practices, and the diversification of supply sources. These strategies are essential for minimizing losses during periods of disruption. Participant P9 highlighted the critical importance of prioritizing inventory management, specifically by developing a detailed inventory management strategy that addresses the unique needs of essential healthcare items. This strategy should include procedures for regular audits, stock level monitoring, and contingency planning to ensure that critical supplies are always available, especially in times of crisis. Expanding on this theme, Participant P18 stressed

the necessity of investing in the capabilities of local suppliers. By doing so, organizations can cultivate a more reliable network of suppliers that can respond quickly to emergencies or disruptions. Building local supplier capacity could involve providing training, resources, and support to help these suppliers meet stringent standards, thereby ensuring a steady supply of necessary goods during critical times. Furthermore, Participant P30 discussed the concept of "jugaad," which refers to frugal engineering and creative problem-solving. This approach emphasizes resourcefulness and innovation in addressing challenges, particularly during crises. By adopting "jugaad", organizations can optimize their existing resources, reduce costs, and develop practical solutions to supply chain disruptions without significant investments. Collectively, these participants' reflections underscore that effective risk-hedging strategies should involve a multifaceted approach. This includes not only more effectively managing the inventory of critical healthcare items but also investing in the development of local supplier capabilities and embracing the principles of frugal engineering. Together, these methods can form a strong framework to mitigate the impact of supply disruptions and enhance overall resilience in the supply chain.

Discussions

We introduce a detailed conceptual model, as depicted in Figure 5, which outlines the key aggregate dimensions that emerged from our analysis of the empirical data. These dimensions include leadership attention scope, crisis leadership, and strategies for mitigating supply chain disruptions. The model illustrates the intricate relationship between leadership attention scope—defined as the extent to which leaders focus on and prioritize various aspects of their operations—and crisis leadership, which refers to the ability of leaders to navigate and respond to unforeseen challenges effectively. These dimensions significantly influence the strategies to mitigate supply chain disruptions during the crisis. By understanding how leadership attention and crisis management intersect, organizations can enhance their resilience and improve their response mechanisms in crises, ultimately leading to more effective management of supply chain challenges.

Our empirical findings provide meaningful insights that significantly contribute to theory and practice. In the following sections, we will discuss each aspect of our research in detail, highlighting its implications and relevance to the field. Our analysis aims to enhance understanding and encourage further exploration of these concepts.

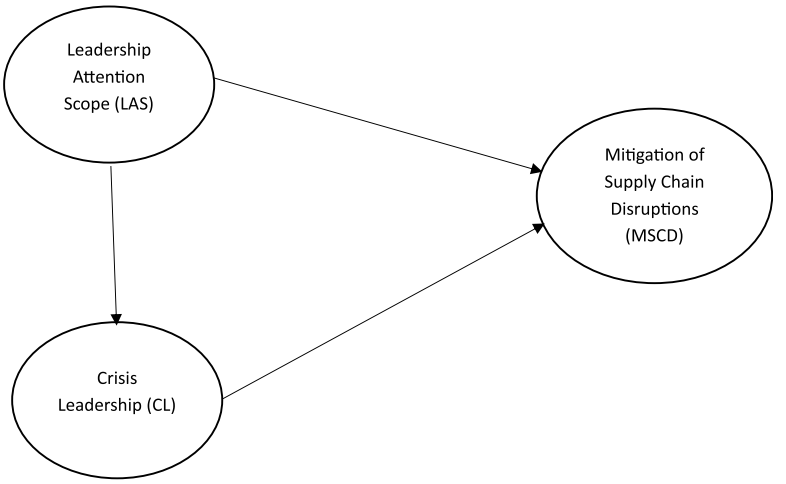

Figure 5. Conceptual model.

Implications for theory

The study provides two significant theoretical contributions that enhance our understanding of leadership behavior in times of crisis. Firstly, it highlights the necessity of integrating the ABV and UET. By combining these frameworks, the study aims to offer a more comprehensive explanation of how leaders respond to challenging situations. The ABV focuses on how leaders selectively pay attention to certain information and stimuli. At the same time, the UET emphasizes the influence of leaders' backgrounds, experiences, and personalities on their decision-making processes. These theories provide insights into how leaders prioritize issues and make crucial decisions under pressure. Secondly, the research explores how the combined insights from ABV and UET can elucidate leaders' specific actions to address and mitigate supply chain disruptions that arise during crises. These two theoretical contributions enrich the existing literature on leadership in crises and offer valuable guidance for practitioners seeking to enhance their crisis management strategies and improve organizational resilience. Next, we present each research proposition that we have drawn based on our data analyses.

Leadership action Scope and crisis leadership

The organizational response to challenges and crises is often viewed as a direct reflection of top managers' cognitive frameworks and thought processes, as suggested by Hambrick and Mason (1984). This concept serves as the foundation for what is known as Upper Echelons Theory (UET), which posits that the characteristics and experiences of senior executives significantly shape their interpretations and decisions. However, while UET provides valuable insights, the influence of psychological factors on managerial cognition and behavior remains underexplored in the existing literature. In our study, we gathered empirical data through comprehensive, in-depth, semi-structured interviews with various participants from the healthcare sector. Our research highlights the significant role that psychological factors play in shaping leaders' behaviors, particularly during crises. We have defined these psychological factors regarding the scope of leadership attention, which is rooted in the attention-based view. This perspective emphasizes how leaders prioritize and focus on specific issues, challenges, and opportunities in their environment.

Building on the foundational concepts that Zheng, Liu, and Gong (2016) presented, we argue that the ABV can effectively address the gaps in UET. By integrating insights from both frameworks, we demonstrate that leaders' behaviors during crises can be more accurately predicted by considering the interplay between their psychological influences and cognitive attention management. Our findings suggest that a comprehensive understanding of leadership behavior in crises requires an examination of both the upper management echelons and the psychological factors that shape how leaders perceive, focus on, and respond to critical challenges. This integration enhances the ability to predict leaders' actions and decisions during turbulent times, leading to more effective organizational responses. Based on this argument, we propose our first research proposition:

P1: The Leadership Attention Scope (LAS) influences leaders' behavior during crises (CL).

Leadership action scope, crisis leadership and supply chain disruptions mitigation strategies

In this section, we outline the second theoretical contribution of this study, which addresses a significant gap in the existing literature regarding the role of crisis leaders in mitigating supply chain disruptions. Despite numerous studies on supply chain management, the specific ways crisis leaders can effectively influence outcomes during disruptions remain largely unexplored. Our research draws on firsthand accounts from participants who navigated the challenges posed by the

pandemic, providing rich qualitative data that sheds light on this critical area. These personal experiences highlight the nuanced decision-making processes and adaptive strategies employed by leaders in times of crisis, offering insights that previous studies, such as those by Azadegan, Modi, et al. (2021), Falagara Sigala et al. (2022), and Dubey (2023), have not fully captured. By extending the findings of earlier research, this study leverages empirical data to argue that the scope of leadership attention—conceptualised through the ABV—and the principles of crisis leadership framed by the UET play crucial roles in shaping the effectiveness of supply chain mitigation strategies. This relationship is vital during health crises or other disruptions, where swift and informed leadership can significantly impact an organization's resilience and adaptation capacity. Our detailed exploration aims to clarify how these theoretical frameworks can inform practical leadership practices in crises, enhancing overall supply chain robustness. We present our second research proposition as:

P2: The scope of leadership attention and crisis leadership help develop strategies to address supply chain disruptions caused by health crises.

Implications for practice

This study was conducted in the context of the COVID-19 crisis, which has significantly impacted the healthcare supply chain. However, we believe our research findings may also be relevant to a wider range of crises. Previous studies have emphasized the importance of leadership and its role in mitigating disruptions within the supply chain (Finkenstadt and Handfield 2021; Handfield et al. 2024). The insights gained can help predict leadership behaviors during crises that lead to supply chain disruptions—disruptions that can severely affect communities and potentially result in even more significant and far-reaching consequences (Zhao et al. 2024). Our study offers a detailed examination of several psychological factors that play a vital role in influencing the behavior of top managers during a crisis. Key factors include the ability to identify and assess potential threats or opportunities emerging from the external environment, the speed at which decisions are made, and the flexibility of those decisions. Each of these elements significantly shapes how leaders respond in critical situations. For example, communication effectiveness among top managers becomes critical during a crisis. Clear and timely communication can enhance collaboration across teams and departments, fostering a more unified approach to problem-solving. Furthermore, establishing a learning environment encourages innovation and adaptability, allowing organizations to respond more effectively to unexpected challenges. We also examine the cognitive aspects of leadership that influence decision-making during crises. These aspects can lead to proactive strategies, such as building alternate sourcing channels, establishing backup suppliers, and developing robust risk-hedging strategies. These actions safeguard the organization against immediate disruptions and contribute to long-term resilience in an ever-changing business landscape. In brief, our research highlights that a deeper understanding of these psychological factors and the strategic actions they inspire can empower top managers to navigate crises more effectively, ultimately benefiting their organizations and communities.

Limitations and future research directions

We acknowledge our study's limitations, a common characteristic of all research endeavors. It is essential to take these limitations into account when interpreting the findings. The research is rooted in an interpretivist philosophy and utilizes an inductive approach to develop theoretical insights based on semi-structured interviews with participants. To analyze the data, we have adopted the framework established by Gioia, Corley, and Hamilton (2013), which guides us in constructing a robust data structure derived from the empirical evidence gathered. The

methodology forms the cornerstone of our study, allowing us to draw substantial conclusions from participants' experiences. Consequently, the research propositions presented are based on insights gained from 33 semi-structured qualitative interviews. It is important to note that, due to the nature of this research, we have not tested our conceptual model. Moreover, this study targets explicitly the healthcare crisis triggered by the COVID-19 pandemic. As such, the experiences, perspectives, and insights drawn upon in this study are predominantly related to the context of the pandemic. This raises important questions regarding the applicability of our findings to other types of crises. Future research must explore and examine how the insights gained from this study can be generalized or adapted to different crises, ensuring a broader understanding of crisis management in various contexts. Furthermore, the proposed conceptual model illustrated in Figure 5 offers a framework that can be empirically tested using panel data analysis. This approach will enable researchers to examine the relationships between variables over time, allowing for a clearer understanding of the causal pathways. By analyzing the panel data, we can identify and confirm the directionality of the paths proposed in the model, enhancing the validity of our findings and contributing to a deeper insight into the dynamics at play.

Conclusion

This study empirically examines leadership's critical role during times of crisis, particularly its influence on mitigating supply chain strategies within the healthcare sector. Supply chain leadership has received attention in previous research; however, many studies have demonstrated a lack of theoretical depth and practical relevance. This deficiency often contributes to a limited understanding of the complexities involved in supply chain management from a broader, more holistic perspective. To address these shortcomings, we have adopted an inductive research approach to develop a comprehensive theory of crisis leadership, specifically within the context of the healthcare supply chain. By doing so, we intend to expand the existing theoretical boundaries and offer new and intriguing insights that warrant further exploration. Our analysis focuses on the various challenges healthcare supply chains face during crises—such as pandemics—and how effective leadership can facilitate swift and strategic responses to these challenges. This study will serve as a valuable guide for academics, practitioners, and leaders alike, providing them with a deeper understanding of the intricate link between established leadership theories and effective supply chain risk management practices. Through our findings, we contribute to developing best practices that can enhance resilience and adaptability in healthcare supply chains during uncertain times.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Dr. Manisha Tiwari is a Lecturer (Assistant Professor) at Hull University Business School, The University of Hull, specializing in Logistics and Supply Chain Management. She holds a PhD in Management from Liverpool John Moores University, UK. Prior to her position at the University of Hull, Dr. Tiwari served as an adjunct lecturer at Leeds Beckett University and worked as a consultant for firms such as Ernst & Young (E&Y), Tata Consultancy Services (TCS), and Infosys. Her research interests focus on the intersection of healthcare operations management, information systems, supply chain finance, and organizational theories. Dr. Tiwari has published in several leading international journals, including Transportation Research: E, Technovation, the International Journal of Production Research, Supply Chain Management: An International Journal, and the International Studies of Management & Organization.

Professor George Lodorfos is Dean of Leeds Business School at Leeds Beckett University, UK, and a Professor of Strategic Management and Innovation. He holds a PhD in the Management of Research and Development from

the University of Manchester/UMIST and has extensive experience in academic leadership, research, and business engagement. His research focuses on innovation, enterprise and change, consumer behaviour, and organizational resilience, with a particular emphasis on SMEs' sustainable development. He has published extensively in refereed high-impact journals and has received multiple research awards. He also serves on the editorial boards of several academic journals and is an active reviewer for leading publications and funding bodies, including the Economic and Social Research Council (UK). Professor Lodorfos is an active member of professional associations, contributes to national policy discussions, and collaborates with business networks to support sustainable and inclusive business growth.

Zoe McClelland is the Head of Business Strategy, Operations, and Enterprise at Leeds Business School, where she provides academic leadership and is part of the School Leadership Team, overseeing Employability & Employer Engagement. Since joining the University in 2000, she has developed numerous courses for working professionals and established undergraduate and master's programs in Business and Management. Zoe has also led successful franchise partnerships in Turkey, Mauritius, Singapore, and Indonesia. Her work emphasizes employability, work-based learning, and collaboration with industry. She has experience in management roles in the Hospitality and Leisure industries and her research focuses on employability, work-based learning, and enhancing the student experience.

Mr. Shravan Nair is an experienced security operations professional with over six years of dedicated service in various sectors, including healthcare, warehouse management, and security enforcement. His skill set includes risk assessment, emergency response, and operational efficiency, all aimed at ensuring a safe environment for both staff and patients in healthcare settings. Shravan earned a Master of Science degree in International Business Management from Leeds Beckett University in Leeds, UK. His academic focus on healthcare supply chain management provided him with valuable insights into the complexities of logistics and resource allocation within the healthcare industry.

ORCID

Manisha Tiwari http://orcid.org/0000-0003-1521-4848

References

Ahmed, S. K. 2024. "The Pillars of Trustworthiness in Qualitative Research." *Journal of Medicine, Surgery, and Public Health* 2:100051. https://doi.org/10.1016/j.glmedi.2024.100051.

Akinyele, A. I., and Z. Chen. 2024. "Dark Clouds of Leadership: Causes and Consequences of Toxic Leadership." *International Studies of Management & Organization* : 1–28. https://doi.org/10.1080/00208825.2024.2442185.

Altay, N., and R. Pal. 2014. "Information Diffusion Among Agents: Implications for Humanitarian Operations." *Production and Operations Management* 23 (6):1015–1027. https://doi.org/10.1111/poms.12102.

Al Owad, A., P. Samaranayake, A. Karim, and K. B. Ahsan. 2018. "An Integrated Lean Methodology for Improving Patient Flow in an Emergency Department–Case Study of a Saudi Arabian Hospital." *Production Planning & Control* 29 (13):1058–1081. https://doi.org/10.1080/09537287.2018.1511870.

Alvesson, M., and J. Sandberg. 2024. "The Art of Phenomena Construction: A Framework for Coming Up With Research Phenomena Beyond 'the Usual Suspects'." *Journal of Management Studies* 61 (5):1737–1765. https://doi.org/10.1111/joms.12969.

An, B. Y., and S. Y. Tang. 2020. "Lessons from COVID-19 responses in East Asia: Institutional infrastructure and enduring policy instruments." *The American Review of Public Administration* 50 (6–7): 790–800.

Azadegan, A., I. Shaheen, K. Linderman, and A. Fereidooni. 2021. "Leadership Styles in Supply Chain Disruptions: A Multimethod Evaluation Based on Practitioner Insights." *International Journal of Operations & Production Management* 41 (10):1615–1632. https://doi.org/10.1108/IJOPM-10-2020-0684.

Azadegan, A., S. Modi, and L. Lucianetti. 2021. "Surprising Supply Chain Disruptions: Mitigation Effects of Operational Slack and Supply Redundancy." *International Journal of Production Economics* 240:108218. https://doi.org/10.1016/j.ijpe.2021.108218.

Bacha, E., and E. Niesten. 2024. "Cognitive Capabilities of Moral Leaders in Turbulent Environments: A Review, Theory Integration and Way Forward." *Journal of Managerial Psychology* 39 (8):1046–1062. https://doi.org/10.1108/JMP-07-2023-0393.

Bag, S., P. Dhamija, R. K. Singh, M. S. Rahman, and V. R. Sreedharan. 2023. "Big Data Analytics and Artificial Intelligence Technologies Based Collaborative Platform Empowering Absorptive Capacity in Health Care Supply Chain: An Empirical Study." *Journal of Business Research* 154:113315. https://doi.org/10.1016/j.jbusres.2022.113315.

Bag, S., S. Gupta, T. M. Choi, and A. Kumar. 2024. "Roles of Innovation Leadership on Using Big Data Analytics to Establish Resilient Healthcare Supply Chains to Combat the COVID-19 Pandemic: A Multimethodological Study." *IEEE Transactions on Engineering Management* 71:13213–13226. https://doi.org/10.1109/TEM.2021.3101590.

Bailey, K., and D. Breslin. 2021. "The COVID-19 Pandemic: What Can We Learn from Past Research in Organizations and Management?" *International Journal of Management Reviews* 23 (1):3–6. https://doi.org/10.1111/ijmr.12237.

Balcik, B., B. M. Beamon, C. C. Krejci, K. M. Muramatsu, and M. Ramirez. 2010. "Coordination in Humanitarian Relief Chains: Practices, Challenges and Opportunities." *International Journal of Production Economics* 126 (1): 22–34. https://doi.org/10.1016/j.ijpe.2009.09.008.

Bansal, P., W. K. Smith, and E. Vaara. 2018. "New Ways of Seeing Through Qualitative Research." *Academy of Management Journal* 61 (4):1189–1195. https://doi.org/10.5465/amj.2018.4004.

Bansal, P., J. Gualandris, and N. Kim. 2020. "Theorizing Supply Chains With Qualitative Big Data and Topic Modeling." *Journal of Supply Chain Management* 56 (2):7–18. https://doi.org/10.1111/jscm.12224.

Bansal, P., K. Corley, and C. E. Devers. 2024. "Journal of Management Is Pushing the Frontiers of Qualitative Research." *Journal of Management* 50 (6):1979–1983. https://doi.org/10.1177/01492063241252071.

Barratt, M., T. Y. Choi, and M. Li. 2011. "Qualitative Case Studies in Operations Management: Trends, Research Outcomes, and Future Research Implications." *Journal of Operations Management* 29 (4):329–342. https://doi.org/10.1016/j.jom.2010.06.002.

Bealt, J., and S. A. Mansouri. 2018. "From Disaster to Development: A Systematic Review of Community-Driven Humanitarian Logistics." *Disasters* 42 (1):124–148. https://doi.org/10.1111/disa.12232.

Beaulieu, M., O. Bentahar, S. Benzidia, and A. Gunasekaran. 2024. "Digitalization Initiatives of Home Care Medical Supply Chain: A Case-Study-Based Approach." *IEEE Transactions on Engineering Management* 71: 6481–6494. https://doi.org/10.1109/TEM.2023.3265624.

Beecham, S., I. Richardson, I. Sommerville, P. O'Leary, S. Baker, and J. Noll. 2018. "Triangulating Research Dissemination Methods: A Three-Pronged Approach to Closing the Research–Practice Divide." *Software Technology: 10 Years of Innovation in IEEE Computer* :58–89. IEEE Computer Society.

Behl, A., and P. Dutta. 2019. "Humanitarian Supply Chain Management: A Thematic Literature Review and Future Directions of Research." *Annals of Operations Research* 283 (1-2):1001–1044. https://doi.org/10.1007/s10479-018-2806-2.

Behl, A., N. Jayawardena, A. Nigam, V. Pereira, A. Shankar, and C. Jebarajakirthy. 2023. "Investigating the Revised International Marketing Strategies During COVID-19 Based on Resources and Capabilities of the Firms: A Mixed Method Approach." *Journal of Business Research* 158:113662. https://doi.org/10.1016/j.jbusres.2023.113662.

Betcheva, L., F. Erhun, and H. Jiang. 2021. "OM Forum—Supply Chain Thinking in Healthcare: Lessons and Outlooks." *Manufacturing & Service Operations Management* 23 (6):1333–1353. https://doi.org/10.1287/msom.2020.0920.

Bhakoo, V., and T. Choi. 2013. "The Iron Cage Exposed: Institutional Pressures and Heterogeneity across the Healthcare Supply Chain." *Journal of Operations Management* 31 (6):432–449. https://doi.org/10.1016/j.jom.2013.07.016.

Boal, K. B., and R. Hooijberg. 2000. "Strategic Leadership Research: Moving on." *The Leadership Quarterly* 11 (4): 515–549. https://doi.org/10.1016/S1048-9843(00)00057-6.

Bode, C., and S. M. Wagner. 2015. "Structural Drivers of Upstream Supply Chain Complexity and the Frequency of Supply Chain Disruptions." *Journal of Operations Management* 36 (1):215–228. https://doi.org/10.1016/j.jom.2014.12.004.

Boin, A., and P. T. Hart. 2003. "Public Leadership in Times of Crisis: Mission Impossible?" *Public Administration Review* 63 (5):544–553. https://doi.org/10.1111/1540-6210.00318.

Brielmaier, C., and M. Friesl. 2023. "The Attention-Based View: Review and Conceptual Extension Towards Situated Attention." *International Journal of Management Reviews* 25 (1):99–129. https://doi.org/10.1111/ijmr.12306.

Bundy, J., M. D. Pfarrer, C. E. Short, and W. T. Coombs. 2017. "Crises and Crisis Management: Integration, Interpretation, and Research Development." *Journal of Management* 43 (6):1661–1692. https://doi.org/10.1177/0149206316680030.

Caniato, F., G. Graham, J. K. Roehrich, and A. Vereecke. 2023. "Impact Pathways: A Home for Insights from Relevant and Impactful Operations and Supply Chain Management Research." *International Journal of Operations & Production Management* 43 (13):270–288. https://doi.org/10.1108/IJOPM-03-2023-0163.

Carter, C. R., G. Meschnig, and L. Kaufmann. 2015. "Moving to the Next Level: Why Our Discipline Needs More Multilevel Theorization." *Journal of Supply Chain Management* 51 (4):94–102. https://doi.org/10.1111/jscm.12083.

Chatterjee, S., R. Chaudhuri, and D. Vrontis. 2024. "Examining the Impact of Adoption of Emerging Technology and Supply Chain Resilience on Firm Performance: Moderating Role of Absorptive Capacity and Leadership Support." *IEEE Transactions on Engineering Management* 71:10373–10386. https://doi.org/10.1109/TEM.2021.3134188.

Chen, Lujie, Fu Jia, Taiyu Li, and Tianyu Zhang. 2021. "Supply Chain Leadership and Firm Performance: A Meta-Analysis." *International Journal of Production Economics* 235:108082. https://doi.org/10.1016/j.ijpe.2021.108082.

Childe, S. J. 2017. "Case Studies in the Management of Operations." *Production Planning & Control* 28 (1):1.

Choi, T. M., C. H. Chiu, and H. K. Chan. 2016. "Risk Management of Logistics Systems." *Transportation Research Part E: Logistics and Transportation Review* 90:1–6. https://doi.org/10.1016/j.tre.2016.03.007.
Choi, T. M., X. Wen, X. Sun, and S. H. Chung. 2019. "The Mean-Variance Approach for Global Supply Chain Risk Analysis with Air Logistics in the Blockchain Technology Era." *Transportation Research Part E: Logistics and Transportation Review* 127:178–191. https://doi.org/10.1016/j.tre.2019.05.007.
Choi, T. M. 2021a. "Risk Analysis in Logistics Systems: A Research Agenda During and After the COVID-19 Pandemic." *Transportation Research Part E: Logistics and Transportation Review* 145:102190. https://doi.org/10.1016/j.tre.2020.102190.
Choi, T. M., and X. Shi. 2024. "On-Demand Ride-Hailing Service Platforms with Hired Drivers During Coronavirus (COVID-19) Outbreak: Can Blockchain Help?" *IEEE Transactions on Engineering Management* 71: 737–752. https://doi.org/10.1109/TEM.2021.3131044.
Choi, T. M. 2021b. "Fighting Against COVID-19: What Operations Research Can Help and the Sense-and-Respond Framework." *Annals of Operations Research* : 1–17. https://doi.org/10.1007/s10479-021-03973-w.
Conlon, Catherine, Virpi Timonen, Catherine Elliott-O'Dare, Sorcha O'Keeffe, and Geraldine Foley. 2020. "Confused About Theoretical Sampling? Engaging Theoretical Sampling in Diverse Grounded Theory Studies." *Qualitative Health Research* 30 (6):947–959. https://doi.org/10.1177/1049732319899139.
Coombs, W. T., and S. J. Holladay. 1996. "Communication and Attributions in a Crisis: An Experimental Study in Crisis Communication." *Journal of Public Relations Research* 8 (4):279–295. https://doi.org/10.1207/s1532754xjprr0804_04.
Corbin, J. M., and A. Strauss. 1990. "Grounded Theory Research: Procedures, Canons, and Evaluative Criteria." *Qualitative Sociology* 13 (1):3–21. https://doi.org/10.1007/BF00988593.
Corley, K., P. Bansal, and H. Yu. 2021. "An Editorial Perspective on Judging the Quality of Inductive Research When the Methodological Straightjacket is Loosened." *Strategic Organization* 19 (1):161–175. https://doi.org/10.1177/1476127020968180.
Day, D. V., J. W. Fleenor, L. E. Atwater, R. E. Sturm, and R. A. McKee. 2014. "Advances in Leader and Leadership Development: A Review of 25 Years of Research and Theory." *The Leadership Quarterly* 25 (1):63–82. https://doi.org/10.1016/j.leaqua.2013.11.004.
De Foo, Chuan, Monica Verma, Si Ying Tan, Jess Hamer, Nina van der Mark, Aungsumalee Pholpark, Piya Hanvoravongchai, Paul Li Jen Cheh, Tiara Marthias, Yodi Mahendradhata, et al. 2023. "Health Financing Policies during the COVID-19 Pandemic and Implications for Universal Health Care: A Case Study of 15 Countries." *The Lancet. Global Health* 11 (12):e1964–e1977. https://doi.org/10.1016/S2214-109X(23)00448-5.
Dixit, A., and P. Dutta. 2024. "Thematic Review of Healthcare Supply Chain in Disasters with Challenges and Future Research Directions." *International Journal of Disaster Risk Reduction* 100:104161. https://doi.org/10.1016/j.ijdrr.2023.104161.
Dubey, R. 2023. "Unleashing the Potential of Digital Technologies in Emergency Supply Chain: The Moderating Effect of Crisis Leadership." *Industrial Management & Data Systems* 123 (1):112–132. https://doi.org/10.1108/IMDS-05-2022-0307.
Dubey, R., D. J. Bryde, Y. K. Dwivedi, G. Graham, C. Foropon, and T. Papadopoulos. 2023. "Dynamic Digital Capabilities and Supply Chain Resilience: The Role of Government Effectiveness." *International Journal of Production Economics* 258:108790. https://doi.org/10.1016/j.ijpe.2023.108790.
Duensing, S., M. C. Schleper, and C. Busse. 2023. "Wildlife Trafficking as a Societal Supply Chain Risk: Removing the Parasite without Damaging the Host?" *Journal of Supply Chain Management* 59 (2):3–32. https://doi.org/10.1111/jscm.12297.
Falagara Sigala, I., M. Sirenko, T. Comes, and G. Kovács. 2022. "Mitigating Personal Protective Equipment (PPE) Supply Chain Disruptions in Pandemics–a System Dynamics Approach." *International Journal of Operations & Production Management* 42 (13):128–154. https://doi.org/10.1108/IJOPM-09-2021-0608.
Fernandes, E., and A. Burcharth. 2024. "Why Traditional Firms from the Same Industry Reject Digital Transformation: Structural Constraints of Perception and Attention." *Long Range Planning* 57 (2):102426. https://doi.org/10.1016/j.lrp.2024.102426.
Finkenstadt, D. J., and R. Handfield. 2021. "Blurry Vision: Supply Chain Visibility for Personal Protective Equipment During COVID-19." *Journal of Purchasing and Supply Management* 27 (3):100689. https://doi.org/10.1016/j.pursup.2021.100689.
Finkenstadt, D. J., and R. Handfield. 2023. "The Influence of Supply Chain Immunity Perceptions on COVID-19 Vaccine Willingness in Supply Chain Professionals." *The International Journal of Logistics Management* 34 (1): 84–105. https://doi.org/10.1108/IJLM-03-2022-0111.
Flynn, B. B., X. Koufteros, and G. Lu. 2016. "On Theory in Supply Chain Uncertainty and Its Implications for Supply Chain Integration." *Journal of Supply Chain Management* 52 (3):3–27. https://doi.org/10.1111/jscm.12106.
Friday, D., S. Ryan, R. Sridharan, and D. Collins. 2018. "Collaborative Risk Management: A Systematic Literature Review." *International Journal of Physical Distribution & Logistics Management* 48 (3):231–253. https://doi.org/10.1108/IJPDLM-01-2017-0035.

Gioia, D. A., K. G. Corley, and A. L. Hamilton. 2013. "Seeking Qualitative Rigor in Inductive Research: Notes on the Gioia Methodology." *Organizational Research Methods* 16 (1):15–31. https://doi.org/10.1177/1094428112452151.
Gleibs, I. H. 2024. "A Social Identity Approach to Crisis Leadership." *The British Journal of Social Psychology*. https://doi.org/10.1111/bjso.12805.
Govindan, K., S. P. Sethi, T. C. E. Cheng, and S. F. Lu. 2023. "Designing Supply Chain Strategies against Epidemic Outbreaks Such as COVID-19: Review and Future Research Directions." *Decision Sciences* 54 (4):365–374. https://doi.org/10.1111/deci.12609.
Grimm, J., A. Langley, and J. Reinecke. 2024. "Process Research Methods for Studying Supply Chains and Their Management." *Journal of Supply Chain Management* 60 (4):3–26. https://doi.org/10.1111/jscm.12331.
Grodal, S., M. Anteby, and A. L. Holm. 2021. "Achieving Rigor in Qualitative Analysis: The Role of Active Categorization in Theory Building." *Academy of Management Review* 46 (3):591–612. https://doi.org/10.5465/amr.2018.0482.
Gupta, S., M. K. Starr, R. Z. Farahani, and N. Matinrad. 2016. "Disaster Management from a POM Perspective: Mapping a New Domain." *Production and Operations Management* 25 (10):1611–1637. https://doi.org/10.1111/poms.12591.
Gupta, S., M. K. Starr, R. Zanjirani Farahani, and M. M. Ghodsi. 2020. "Prevention of Terrorism–an Assessment of Prior POM Work and Future Potentials." *Production and Operations Management* 29 (7):1789–1815. https://doi.org/10.1111/poms.13192.
Haldane, Victoria, Chuan De Foo, Salma M. Abdalla, Anne-Sophie Jung, Melisa Tan, Shishi Wu, Alvin Chua, Monica Verma, Pami Shrestha, Sudhvir Singh, et al. 2021. "Health Systems Resilience in Managing the COVID-19 Pandemic: Lessons from 28 Countries." *Nature Medicine* 27 (6):964–980. https://doi.org/10.1038/s41591-021-01381-y.
Hällgren, M., L. Rouleau, and M. De Rond. 2018. "A Matter of Life or Death: How Extreme Context Research Matters for Management and Organization Studies." *Academy of Management Annals* 12 (1):111–153. https://doi.org/10.5465/annals.2016.0017.
Hambrick, D. C., and P. A. Mason. 1984. "Upper Echelons: The Organization as a Reflection of Its Top Managers." *The Academy of Management Review* 9 (2):193–206. https://doi.org/10.2307/258434.
Hambrick, D. C. 2007. "Upper Echelons Theory: An Update." *Academy of Management Review* 32 (2):334–343. https://doi.org/10.5465/amr.2007.24345254.
Handfield, R. B., G. Graham, and L. Burns. 2020. "Corona Virus, Tariffs, Trade Wars and Supply Chain Evolutionary Design." *International Journal of Operations & Production Management* 40 (10):1649–1660. https://doi.org/10.1108/IJOPM-03-2020-0171.
Handfield, R. B., A. S. Patrucco, Z. Wu, C. Yukins, and T. Slaughter. 2024. "A New Acquisition Model for the Next Disaster: Overcoming Disaster Federalism Issues Through Effective Utilization of the Strategic National Stockpile." *Public Administration Review* 84 (1):65–85. https://doi.org/10.1111/puar.13656.
Harland, Christine Mary, Louise Knight, Andrea S. Patrucco, Jane Lynch, Jan Telgen, Esmee Peters, Tünde Tátrai, and Petra Ferk. 2021. "Practitioners' Learning About Healthcare Supply Chain Management in the COVID-19 Pandemic: A Public Procurement Perspective." *International Journal of Operations & Production Management* 41 (13):178–189. https://doi.org/10.1108/IJOPM-05-2021-0348.
Hartwell, C. A., and T. Devinney. 2021. "Populism, Political Risk, and Pandemics: The Challenges of Political Leadership for Business in a post-COVID World." *Journal of World Business* 56 (4):101225. https://doi.org/10.1016/j.jwb.2021.101225.
Henderson, L. R. 2024. "Developing Attributes of the Leader: From Military Service to the Civilian Workforce." *Advances in Developing Human Resources* 26 (1):5–19. https://doi.org/10.1177/15234223231212444.
Hess, E. P., C. R. Grudzen, R. Thomson, A. S. Raja, and C. R. Carpenter. 2015. "Shared Decision-Making in the Emergency Department: Respecting Patient Autonomy When Seconds Count." *Academic Emergency Medicine: official Journal of the Society for Academic Emergency Medicine* 22 (7):856–864. https://doi.org/10.1111/acem.12703.
Ho, A., and S. Pinney. 2016. "Redefining Ethical Leadership in a 21st-Century Healthcare System." *Healthcare Management Forum* 29 (1):39–42. https://doi.org/10.1177/0840470415613910.
Hodgkinson, G. P., and M. P. Healey. 2011. "Psychological Foundations of Dynamic Capabilities: Reflexion and Reflection in Strategic Management." *Strategic Management Journal* 32 (13):1500–1516. https://doi.org/10.1002/smj.964.
Horner, M. 1997. "Leadership Theory: Past, Present and Future." *Team Performance Management: An International Journal* 3 (4):270–287. https://doi.org/10.1108/13527599710195402.
House, R. J., and M. Javidan. 2004. "Overview of GLOBE." *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* :9–28.
Hossain, M. K., V. Thakur, and Y. Kazancoglu. 2023. "Developing a Resilient Healthcare Supply Chain to Prevent Disruption in the Wake of Emergency Health Crisis." *International Journal of Emerging Markets* 18 (6):1307–29. https://doi.org/10.1108/IJOEM-10-2021-1628.

Iftikhar, A., L. Purvis, I. Giannoccaro, and Y. Wang. 2023. "The Impact of Supply Chain Complexities on Supply Chain Resilience: The Mediating Effect of Big Data Analytics." *Production Planning & Control* 34 (16):1562–82. https://doi.org/10.1080/09537287.2022.2032450.

Ivanov, D. 2020. "Predicting the Impacts of Epidemic Outbreaks on Global Supply Chains: A Simulation-Based Analysis on the Coronavirus Outbreak (COVID-19/SARS-CoV-2) Case." *Transportation Research. Part E, Logistics and Transportation Review* 136:101922. https://doi.org/10.1016/j.tre.2020.101922.

James, E. H., L. P. Wooten, and K. Dushek. 2011. "Crisis Management: Informing a New Leadership Research Agenda." *Academy of Management Annals* 5 (1):455–93. https://doi.org/10.5465/19416520.2011.589594.

Jansen, J. J., D. Vera, and M. Crossan. 2009. "Strategic Leadership for Exploration and Exploitation: The Moderating Role of Environmental Dynamism." *The Leadership Quarterly* 20 (1):5–18. https://doi.org/10.1016/j.leaqua.2008.11.008.

Jia, F., Y. Gong, and S. Brown. 2019. "Multi-Tier Sustainable Supply Chain Management: The Role of Supply Chain Leadership." *International Journal of Production Economics* 217:44–63. https://doi.org/10.1016/j.ijpe.2018.07.022.

Johns, G. 2024. "The Context Deficit in Leadership Research." *The Leadership Quarterly* 35 (1):101755. https://doi.org/10.1016/j.leaqua.2023.101755.

Joseph, J., and A. J. Wilson. 2018. "The Growth of the Firm: An Attention-Based View." *Strategic Management Journal* 39 (6):1779–1800. https://doi.org/10.1002/smj.2715.

Kamalahmadi, M., and M. M. Parast. 2017. "An Assessment of Supply Chain Disruption Mitigation Strategies." *International Journal of Production Economics* 184:210–230. https://doi.org/10.1016/j.ijpe.2016.12.011.

Kaufmann, L., and N. Denk. 2011. "How to Demonstrate Rigor When Presenting Grounded Theory Research in the Supply Chain Management Literature." *Journal of Supply Chain Management* 47 (4):64–72. https://doi.org/10.1111/j.1745-493X.2011.03246.x.

Klassen, R. D., and A. Vereecke. 2012. "Social Issues in Supply Chains: Capabilities Link Responsibility, Risk (Opportunity), and Performance." *International Journal of Production Economics* 140 (1):103–115. https://doi.org/10.1016/j.ijpe.2012.01.021.

Klebe, L., J. Felfe, and K. Klug. 2021. "Healthy Leadership in Turbulent Times: The Effectiveness of Health-Oriented Leadership in Crisis." *British Journal of Management* 32 (4):1203–1218. https://doi.org/10.1111/1467-8551.12498.

Klebe, L., J. Felfe, and K. Klug. 2022. "Mission Impossible? Effects of Crisis, Leader and Follower Strain on Health-Oriented Leadership." *European Management Journal* 40 (3):384–392. https://doi.org/10.1016/j.emj.2021.07.001.

Kovács, G., and I. Falagara Sigala. 2021. "Lessons Learned from Humanitarian Logistics to Manage Supply Chain Disruptions." *Journal of Supply Chain Management* 57 (1):41–49. https://doi.org/10.1111/jscm.12253.

Kull, T., F. Wiengarten, D. Power, and P. Shah. 2019. "Acting as Expected: Global Leadership Preferences and the Pursuit of an Integrated Supply Chain." *Journal of Supply Chain Management* 55 (3):24–44. https://doi.org/10.1111/jscm.12208.

Kumar, A., R. K. Singh, and D. Singh. 2024. "Supply Chain Resilience in Developing Countries: A Bibliometric Analysis and Future Research Directions." *Benchmarking: An International Journal* 31 (7):2217–2238. https://doi.org/10.1108/BIJ-02-2023-0112.

Kumar, S., T. K. Panda, A. Behl, and A. Kumar. 2021. "A Mindful Path to the COVID-19 Pandemic: An Approach to Promote Physical Distancing Behavior." *International Journal of Organizational Analysis* 29 (5):1117–1143. https://doi.org/10.1108/IJOA-08-2020-2358.

Lim, W. M. 2024. "What is Qualitative Research? An Overview and Guidelines." *Australasian Marketing Journal*. https://doi.org/10.1177/14413582241264619.

Linneberg, M. S., and S. Korsgaard. 2019. "Coding Qualitative Data: A Synthesis Guiding the Novice." *Qualitative Research Journal* 19 (3):259–270. https://doi.org/10.1108/QRJ-12-2018-0012.

Locke, K., M. Feldman, and K. Golden-Biddle. 2022. "Coding Practices and Iterativity: Beyond Templates for Analyzing Qualitative Data." *Organizational Research Methods* 25 (2):262–284. https://doi.org/10.1177/1094428120948600.

Looman, Willemijn, Verena Struckmann, Julia Köppen, Erik Baltaxe, Thomas Czypionka, Mirjana Huic, Janos Pitter, Sabine Ruths, Jonathan Stokes, Roland Bal, et al. 2021. "Drivers of Successful Implementation of Integrated Care for Multi-Morbidity: Mechanisms Identified in 17 Case Studies from 8 European Countries." *Social Science & Medicine (1982)* 277:113728. https://doi.org/10.1016/j.socscimed.2021.113728.

Lord, R. G., C. L. De Vader, and G. M. Alliger. 1986. "A Meta-Analysis of the Relation Between Personality Traits and Leadership Perceptions: An Application of Validity Generalization Procedures." *Journal of Applied Psychology* 71 (3):402–410. https://doi.org/10.1037/0021-9010.71.3.402.

Maitlis, S., and S. Sonenshein. 2010. "Sensemaking in Crisis and Change: Inspiration and Insights from Weick (1988)." *Journal of Management Studies* 47 (3):551–580. https://doi.org/10.1111/j.1467-6486.2010.00908.x.

Marques, L., M. Martins, and C. Araújo. 2020. "The Healthcare Supply Network: Current State of the Literature and Research Opportunities." *Production Planning & Control* 31 (7):590–609. https://doi.org/10.1080/09537287.2019.1663451.

Mervyn, K., N. Amoo, and R. Malby. 2019. "Challenges and Insights in Inter-Organizational Collaborative Healthcare Networks: An Empirical Case Study of a Place-Based Network." *International Journal of Organizational Analysis* 27 (4):875–902. https://doi.org/10.1108/IJOA-05-2018-1415.

Min, H., C. C. Lee, and S. J. Joo. 2022. "Assessing the Efficiency of the Covid-19 Control Measures and Public Health Policy in OECD Countries from Cultural Perspectives." *Benchmarking: An International Journal* 29 (6): 1781–1796. https://doi.org/10.1108/BIJ-05-2021-0241.

Mohammadi, Mahan, Hamid Jafari, Manal Etemadi, Yohani Dalugoda, Heba Mohtady Ali, Hai Phung, Alireza Ahmadvand, Febi Dwirahmadi, Paul Barnes, and Cordia Chu. 2023. "Health Problems of Increasing Man-Made and Climate-Related Disasters on Forcibly Displaced Populations: A Scoping Review on Global Evidence." *Disaster Medicine and Public Health Preparedness* 17:e537. https://doi.org/10.1017/dmp.2023.159.

Mokhtar, A. R. M., A. Genovese, A. Brint, and N. Kumar. 2019. "Supply Chain Leadership: A Systematic Literature Review and a Research Agenda." *International Journal of Production Economics* 216:255–273. https://doi.org/10.1016/j.ijpe.2019.04.001.

Napier, E., S. Y. Liu, and J. Liu. 2024. "Adaptive Strength: Unveiling a Multilevel Dynamic Process Model for Organizational Resilience." *Journal of Business Research* 171:114334. https://doi.org/10.1016/j.jbusres.2023.114334.

Narasimhan, R. 2014. "Theory Development in Operations Management: Extending the Frontiers of a Mature Discipline via Qualitative Research." *Decision Sciences* 45 (2):209–227. https://doi.org/10.1111/deci.12072.

Nazar, R., M. S. Meo, and S. Ali. 2022. "Role of Public Health and Trade for Achieving Sustainable Development Goals." *Journal of Public Affairs* 22 (3):e2585. https://doi.org/10.1002/pa.2585.

Nguyen, L. A., O. S. Crocco, O. Tkachenko, and V. Jonathan. 2022. "Crisis Leadership During COVID-19: The Response of ASEAN and EU Regional Leaders." *Human Resource Development International* 25 (3):381–399. https://doi.org/10.1080/13678868.2022.2071096.

Nicolini, D., and M. Korica. 2021. "Attentional engagement as practice: A study of the attentional infrastructure of healthcare chief executive officers." *Organization Science* 32 (5):1273–1299.

Oc, B. 2018. "Contextual Leadership: A Systematic Review of How Contextual Factors Shape Leadership and Its Outcomes." *The Leadership Quarterly* 29 (1):218–235. https://doi.org/10.1016/j.leaqua.2017.12.004.

Ocasio, W. 1997. "Towards an Attention-Based View of the Firm." *Strategic Management Journal* 18 (S1):187–206. https://doi.org/10.1002/(SICI)1097-0266(199707)18:1+<187::AID-SMJ936>3.0.CO;2-K.

Ocasio, W., and J. Joseph. 2018. "The Attention-Based View of Great Strategies." *Strategy Science* 3 (1):289–294. https://doi.org/10.1287/stsc.2017.0042.

Ocasio, W., T. Laamanen, and E. Vaara. 2018. "Communication and Attention Dynamics: An Attention-Based View of Strategic Change." *Strategic Management Journal* 39 (1):155–167. https://doi.org/10.1002/smj.2702.

O'Kane, C., and J. Cunningham. 2012. "Leadership Changes and Approaches During Company Turnaround." *International Studies of Management & Organization* 42 (4):52–85. https://doi.org/10.2753/IMO0020-8825420403.

Ortiz-Barrios, M., M. Gul, P. López-Meza, M. Yucesan, and E. Navarro-Jiménez. 2020. "Evaluation of Hospital Disaster Preparedness by a Multi-Criteria Decision Making Approach: The Case of Turkish Hospitals." *International Journal of Disaster Risk Reduction: IJDRR* 49:101748. https://doi.org/10.1016/j.ijdrr.2020.101748.

Owens, B. P., and D. R. Hekman. 2012. "Modeling How to Grow: An Inductive Examination of Humble Leader Behaviors, Contingencies, and Outcomes." *Academy of Management Journal* 55 (4):787–818. https://doi.org/10.5465/amj.2010.0441.

Park, K. M. 2021. "Navigating the Digital Revolution and Crisis Times: humanitarian and Innovation-Inspired Leadership through the Pandemic." *Journal of Strategy and Management* 14 (3):360–377. https://doi.org/10.1108/JSMA-01-2021-0021.

Pereira, V., S. Munjal, and M. K. Nandakumar. 2016. "Reverse Dependency: A Longitudinal Case Study Investigation into Headquarter-Subsidiary Relationship in the Context of an Emerging Economy." *International Studies of Management & Organization* 46 (1):50–62. https://doi.org/10.1080/00208825.2015.1007014.

Perlow, L. A., G. A. Okhuysen, and N. P. Repenning. 2002. "The Speed Trap: Exploring the Relationship Between Decision Making and Temporal Context." *Academy of Management Journal* 45 (5):931–955. https://doi.org/10.2307/3069323.

Pittinsky, T. L., and S. Simon. 2007. "Intergroup Leadership." *The Leadership Quarterly* 18 (6):586–605. https://doi.org/10.1016/j.leaqua.2007.09.005.

Pradies, Camille, Ina Aust, Rebecca Bednarek, Julia Brandl, Simone Carmine, Joe Cheal, Miguel Pina e Cunha, Medhanie Gaim, Anne Keegan, Jane K. Lê, et al. 2021. "The Lived Experience of Paradox: How Individuals Navigate Tensions During the Pandemic Crisis." *Journal of Management Inquiry* 30 (2):154–167. https://doi.org/10.1177/1056492620986874.

Pratt, M. G. 2009. "From the Editors: For the Lack of a Boilerplate: Tips on Writing up (and Reviewing) Qualitative Research." *Academy of Management Journal* 52 (5):856–862. https://doi.org/10.5465/amj.2009.44632557.

Probst, G., and S. Raisch. 2005. "Organizational Crisis: The Logic of Failure." *Academy of Management Perspectives* 19 (1):90–105. https://doi.org/10.5465/ame.2005.15841958.

Pounder, P. 2022. "Leadership and Information Dissemination: Challenges and Opportunities in COVID-19." *International Journal of Public Leadership* 18 (2):151–172. https://doi.org/10.1108/IJPL-05-2021-0030.

Rahman, T., S. K. Paul, R. Agarwal, N. Shukla, and F. Taghikhah. 2024. "A Viable Supply Chain Model for Managing Panic-Buying Related Challenges: Lessons Learned from the COVID-19 Pandemic." *International Journal of Production Research* 62 (10):3415–3434. https://doi.org/10.1080/00207543.2023.2237609.

Ren, C. R., and C. Guo. 2011. "Middle Managers' Strategic Role in the Corporate Entrepreneurial Process: Attention-Based Effects." *Journal of Management* 37 (6):1586–1610. https://doi.org/10.1177/0149206310397769.

Restrepo-Morales, J. A., M. Valencia-Cárdenas, and D. García-Pérez-de-Lema. 2024. "The Role of Technological Innovation in the Mitigation of the Crisis Generated by COVID-19: An Empirical Study of Small and Medium-Sized Businesses (SMEs) in Latin America." *International Studies of Management & Organization* 54 (2):120–136. https://doi.org/10.1080/00208825.2023.2301213.

Riggio, R. E., and T. Newstead. 2023. "Crisis Leadership." *Annual Review of Organizational Psychology and Organizational Behavior* 10 (1):201–224. https://doi.org/10.1146/annurev-orgpsych-120920-044838.

Rosenhead, J., L. A. Franco, K. Grint, and B. Friedland. 2019. "Complexity theory and leadership practice: A review, a critique, and some recommendations." *The Leadership Quarterly* 30 (5):101304.

Ruesch, L., M. Tarakci, M. Besiou, and N. Van Quaquebeke. 2022. "Orchestrating Coordination among Humanitarian Organizations." *Production and Operations Management* 31 (5):1977–1996. https://doi.org/10.1111/poms.13660.

Sætren, G. B., J. R. Vaag, I. F. Hansen, and G. A. Bjørnfeld. 2023. "Situational Awareness in a Creeping Crisis: How the Initial Phases of the COVID-19 Pandemic Were Handled from a Crisis Management Perspective in the Nursing Home Agency in Oslo." *Journal of Contingencies and Crisis Management* 31 (3):545–559. https://doi.org/10.1111/1468-5973.12458.

Salem, M., N. Van Quaquebeke, and M. Besiou. 2018. "How Field Office Leaders Drive Learning and Creativity in Humanitarian Aid: Exploring the Role of Boundary-Spanning Leadership for Expatriate and Local Aid Worker Collaboration." *Journal of Organizational Behavior* 39 (5):594–611. https://doi.org/10.1002/job.2246.

Salem, M., N. Van Quaquebeke, M. Besiou, and L. Meyer. 2019. "Intergroup Leadership: How Leaders Can Enhance Performance of Humanitarian Operations." *Production and Operations Management* 28 (11):2877–2897. https://doi.org/10.1111/poms.13085.

Samimi, M., A. F. Cortes, M. H. Anderson, and P. Herrmann. 2022. "What is strategic leadership? Developing a framework for future research." *The Leadership Quarterly* 33 (3):101353.

Saunders, B., J. Kitzinger, and C. Kitzinger. 2015. "Anonymising Interview Data: Challenges and Compromise in Practice." *Qualitative Research: QR* 15 (5):616–632. https://doi.org/10.1177/1468794114550439.

Schaedler, L., L. Graf-Vlachy, and A. König. 2022. "Strategic Leadership in Organizational Crises: A Review and Research Agenda." *Long Range Planning* 55 (2):102156. https://doi.org/10.1016/j.lrp.2021.102156.

Senna, P., A. Reis, A. Dias, O. Coelho, J. Guimarães, and S. Eliana. 2023. "Healthcare Supply Chain Resilience Framework: Antecedents, Mediators, Consequents." *Production Planning & Control* 34 (3):295–309. https://doi.org/10.1080/09537287.2021.1913525.

Senna, P., A. Reis, L. G. Marujo, J. C. Ferro de Guimarães, E. A. Severo, and A. C. D. S. G. dos Santos. 2024. "The Influence of Supply Chain Risk Management in Healthcare Supply Chains Performance." *Production Planning & Control* 35 (12):1368–1383. https://doi.org/10.1080/09537287.2023.2182726.

Shaheen, I., and A. Azadegan. 2020. "Friends or Colleagues? Communal and Exchange Relationships During Stages of Humanitarian Relief." *Production and Operations Management* 29 (12):2828–2850. https://doi.org/10.1111/poms.13254.

Sharif, A. M., and Z. Irani. 2012. "Supply Chain Leadership." *International Journal of Production Economics* 140 (1):57–68. https://doi.org/10.1016/j.ijpe.2012.01.041.

Sharma, G. D., S. Kraus, M. Srivastava, R. Chopra, and A. Kallmuenzer. 2022. "The Changing Role of Innovation for Crisis Management in Times of COVID-19: An Integrative Literature Review." *Journal of Innovation & Knowledge* 7 (4):100281. https://doi.org/10.1016/j.jik.2022.100281.

Shondrick, S. J., J. E. Dinh, and R. G. Lord. 2010. "Developments in Implicit Leadership Theory and Cognitive Science: Applications to Improving Measurement and Understanding Alternatives to Hierarchical Leadership." *The Leadership Quarterly* 21 (6):959–978. https://doi.org/10.1016/j.leaqua.2010.10.004.

Singh, A., N. Shukla, and N. Mishra. 2018. "Social Media Data Analytics to Improve Supply Chain Management in Food Industries." *Transportation Research Part E: Logistics and Transportation Review* 114:398–415. https://doi.org/10.1016/j.tre.2017.05.008.

Smith, W. K., and M. L. Tushman. 2005. "Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams." *Organization Science* 16 (5):522–536. https://doi.org/10.1287/orsc.1050.0134.

Smith, W. K. 2014. "Dynamic Decision Making: A Model of Senior Leaders Managing Strategic Paradoxes." *Academy of Management Journal* 57 (6):1592–1623. https://doi.org/10.5465/amj.2011.0932.

Smollan, R. K., and S. K. Mooney. 2024. "The Bright Side and Dark Side of Performance Expectations: The Role of Organizational Culture and the Impact on Employee Performance and Wellbeing." *International Studies of Management & Organization* 54 (3):218–237. https://doi.org/10.1080/00208825.2024.2320580.

Sodhi, M. S., B. G. Son, and C. S. Tang. 2012. "Researchers' Perspectives on Supply Chain Risk Management." *Production and Operations Management* 21 (1):1–13. https://doi.org/10.1111/j.1937-5956.2011.01251.x.
Sodhi, M. S., and C. S. Tang. 2021a. "Extending AAA Capabilities to Meet PPP Goals in Supply Chains." *Production and Operations Management* 30 (3):625–632. https://doi.org/10.1111/poms.13304.
Sodhi, M. S., and C. S. Tang. 2021b. "Supply Chain Management for Extreme Conditions: Research Opportunities." *Journal of Supply Chain Management* 57 (1):7–16. https://doi.org/10.1111/jscm.12255.
Sodhi, M. S., C. S. Tang, and E. T. Willenson. 2023. "Research Opportunities in Preparing Supply Chains of Essential Goods for Future Pandemics." *International Journal of Production Research* 61 (8):2416–2431. https://doi.org/10.1080/00207543.2021.1884310.
Soltani, E., P. K. Ahmed, Y. Ying Liao, and P. U. Anosike. 2014. "Qualitative Middle-Range Research in Operations Management: The Need for Theory-Driven Empirical Inquiry." *International Journal of Operations & Production Management* 34 (8):1003–1027. https://doi.org/10.1108/IJOPM-11-2012-0486.
Sorensen, G., J. T. Dennerlein, S. E. Peters, E. L. Sabbath, E. L. Kelly, and G. R. Wagner. 2021. "The Future of Research on Work, Safety, Health and Wellbeing: A Guiding Conceptual Framework." *Social Science & Medicine (1982)* 269:113593. https://doi.org/10.1016/j.socscimed.2020.113593.
Spieske, A., M. Gebhardt, M. Kopyto, and H. Birkel. 2022. "Improving Resilience of the Healthcare Supply Chain in a Pandemic: Evidence from Europe During the COVID-19 Crisis." *Journal of Purchasing and Supply Management* 28 (5):100748. https://doi.org/10.1016/j.pursup.2022.100748.
Sriharan, Abi, Attila J. Hertelendy, Jane Banaszak-Holl, Michelle M. Fleig-Palmer, Cheryl Mitchell, Amit Nigam, Jennifer Gutberg, Devin J. Rapp, and Sara J. Singer. 2022. "Public Health and Health Sector Crisis Leadership During Pandemics: A Review of the Medical and Business Literature." *Medical Care Research and Review: MCRR* 79 (4):475–486. https://doi.org/10.1177/10775587211039201.
Tavella, E. 2022. "Strategizing in Pluralistic Organizations: Extending Theoretical Frames to Include Disrupted Contexts." *International Studies of Management & Organization* 52 (3-4):185–204. https://doi.org/10.1080/00208825.2022.2131228.
Tiwari, M., D. J. Bryde, F. Stavropoulou, and G. Malhotra. 2024a. "Understanding the Evolution of Flexible Supply Chain in the Business-to-Business Sector: A Resource-Based Theory Perspective." *International Studies of Management & Organization* 54 (4):380–406. https://doi.org/10.1080/00208825.2024.2324245.
Tiwari, M., D. J. Bryde, F. Stavropoulou, R. Dubey, S. Kumari, and C. Foropon. 2024b. "Modelling Supply Chain Visibility, Digital Technologies, Environmental Dynamism and Healthcare Supply Chain Resilience: An Organisation Information Processing Theory Perspective." *Transportation Research Part E: Logistics and Transportation Review* 188:103613. https://doi.org/10.1016/j.tre.2024.103613.
Tracy, B. 2021. "20 Leadership Quotes for Great Leaders by Brian Tracy." [Blog post]. https://www.briantracy.com/blog/leadership-success/leadershipquotes-for-inspiration/
Uhl-Bien, M., R. Marion, and B. McKelvey. 2007. "Complexity Leadership Theory: Shifting Leadership from the Industrial Age to the Knowledge Era." *The Leadership Quarterly* 18 (4):298–318. https://doi.org/10.1016/j.leaqua.2007.04.002.
Queiroz, M. M., D. Ivanov, A. Dolgui, and S. Fosso Wamba. 2022. "Impacts of Epidemic Outbreaks on Supply Chains: Mapping a Research Agenda Amid the COVID-19 Pandemic Through a Structured Literature Review." *Annals of Operations Research* 319 (1):1159–1196. https://doi.org/10.1007/s10479-020-03685-7.
Queiroz, M. M., S. F. Wamba, C. J. C. Jabbour, and M. C. Machado. 2022. "Supply Chain Resilience in the UK During the Coronavirus Pandemic: A Resource Orchestration Perspective." *International Journal of Production Economics* 245:108405. https://doi.org/10.1016/j.ijpe.2021.108405.
Queiroz, M. M., S. Fosso Wamba, and R. M. Branski. 2022. "Supply Chain Resilience During the COVID-19: Empirical Evidence from an Emerging Economy." *Benchmarking: An International Journal* 29 (6):1999–2018. https://doi.org/10.1108/BIJ-08-2021-0454.
Queiroz, M. M., and S. Fosso Wamba. 2021. "A Structured Literature Review on the Interplay between Emerging Technologies and COVID-19–Insights and Directions to Operations Fields." *Annals of Operations Research* 335 (3):1–27. https://doi.org/10.1007/s10479-021-04107-y.
Quy, H. T. K., M. D. Tran, and T. M. Dinh. 2024. "Creative Adaptability and Negative Emotions of Employees During a Crisis: The Role of Servant Leadership." *International Studies of Management & Organization* 54 (1): 48–67. https://doi.org/10.1080/00208825.2023.2277973.
Vázquez-Martínez, J. U., J. Morales-Mediano, A. L. Leal-Rodríguez, and C. Pennano-Villanueva. 2024. "Navigating the Storm: How Managers' Decisions Shape Companies in Crisis." *Review of Managerial Science*. https://doi.org/10.1007/s11846-024-00801-w.
Waldman, D. A., M. Javidan, and P. Varella. 2004. "Charismatic Leadership at the Strategic Level: A New Application of Upper Echelons Theory." *The Leadership Quarterly* 15 (3):355–380. https://doi.org/10.1016/j.leaqua.2004.02.013.
Waugh, W. L., Jr., and G. Streib. 2006. "Collaboration and Leadership for Effective Emergency Management." *Public Administration Review* 66 (s1):131–140. https://doi.org/10.1111/j.1540-6210.2006.00673.x.

Williams, T. A., D. A. Gruber, K. M. Sutcliffe, D. A. Shepherd, and E. Y. Zhao. 2017. "Organizational Response to Adversity: Fusing Crisis Management and Resilience Research Streams." *Academy of Management Annals* 11 (2):733–769. https://doi.org/10.5465/annals.2015.0134.

Wolbers, J., K. Boersma, and P. Groenewegen. 2018. "Introducing a Fragmentation Perspective on Coordination in Crisis Management." *Organization Studies* 39 (11):1521–1546. https://doi.org/10.1177/0170840617717095.

WHO. 2020. "Operational Framework for Primary Health Care: Transforming Vision into Action." https://iris.who.int/bitstream/handle/10665/337641/9789240017832-eng.pdf.

Wu, Y. L., B. Shao, A. Newman, and G. Schwarz. 2021. "Crisis Leadership: A Review and Future Research Agenda." *The Leadership Quarterly* 32 (6):101518. https://doi.org/10.1016/j.leaqua.2021.101518.

Wutich, A., M. Beresford, and H. R. Bernard. 2024. "Sample Sizes for 10 Types of Qualitative Data Analysis: An Integrative Review, Empirical Guidance, and Next Steps." *International Journal of Qualitative Methods* 23:1–14. https://doi.org/10.1177/16094069241296206.

Xu, X., T. M. Choi, S. H. Chung, and B. Shen. 2024. "Government Subsidies and Policies for Mask Production under COVID-19: Is It Wise to Control Less?" *IEEE Transactions on Engineering Management* 71:3172–3188. https://doi.org/10.1109/TEM.2022.3198101.

Xu, X., S. P. Sethi, S. H. Chung, and T. M. Choi. 2023. "Reforming Global Supply Chain Management under Pandemics: The GREAT-3Rs Framework." *Production and Operations Management* 32 (2):524–546. https://doi.org/10.1111/poms.13885.

Zander, L. 2020. "Interpersonal Leadership Across Cultures: A Historical Exposé and a Research Agenda." *International Studies of Management & Organization* 50 (4):357–380. https://doi.org/10.1080/00208825.2020.1850980.

Zaoui, S., C. Foguem, D. Tchuente, S. Fosso-Wamba, and B. Kamsu-Foguem. 2023. "The Viability of Supply Chains with Interpretable Learning Systems: The Case of COVID-19 Vaccine Deliveries." *Global Journal of Flexible Systems Management* 24 (4):633–657. https://doi.org/10.1007/s40171-023-00357-w.

Zhao, G., M. Vazquez-Noguerol, S. Liu, and J. C. Prado-Prado. 2024. "Agri-Food Supply Chain Resilience Strategies for Preparing, Responding, Recovering, and Adapting in Relation to Unexpected Crisis: A Cross-Country Comparative Analysis from the COVID-19 Pandemic." *Journal of Business Logistics* 45 (1):1–36. https://doi.org/10.1111/jbl.12361.

Zheng, X., Z. Liu, and X. Gong. 2016. "Why Does Leader Attention Scope Matter for Innovation Ambidexterity? The Mediating Role of Transformational Leadership." *Leadership & Organization Development Journal* 37 (7):912–935. https://doi.org/10.1108/LODJ-12-2014-0242.

Appendix A. Interview guideline

This study examines the critical role that top managers played during the pandemic, specifically in the health crisis that emerged from significant disruptions in the healthcare supply chain. These disruptions resulted in acute shortages of essential healthcare items, seriously challenging health services. Through this interview, we explore the multifaceted challenges top managers encountered during this turbulent period. We aim to understand their decision-making processes, the specific strategies they employed to respond to the healthcare supply chain crisis, and the innovative mitigation strategies they developed to address these shortages effectively. We aim to gather in-depth insights into how leadership adapted to rapidly changing circumstances and what lessons can be learned for future crises. Rest assured, your organization or personal identity will be completely anonymized in our results, ensuring confidentiality. If you agree, we would like to record our conversation to assist in a thorough analysis of the insights shared.

1. Based on your experiences, what were the main issues in the healthcare supply chain during the COVID-19 crisis?
2. How did your organization's top managers deal with the shortages of personal protective equipment (PPE) during the COVID-19 crisis?
3. Can you think of any measures your organization adopted to address the shortage of necessary healthcare items during the COVID-19 crisis?
4. Can you explain the top management behaviors during the COVID-19 crisis?
5. To what extent do the hospital staff have information related to the inventory of the healthcare items?
6. In your opinion, what steps could have reduced the shortages of healthcare items during the COVID-19 crisis?
7. Based on your experience, how does your hospital have regained normalcy during the COVID-19 crisis?

8. Is there anything else relevant for us to understand?
9. Do you have any questions or comments regarding the interview?

We have reached the end of the interview. Thank you very much for your information and the time you have invested!