

2022

Emergency Department Operational Strategies

Joyce W. Davis
Walden University

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Walden University

College of Management and Technology

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Joyce W. Davis

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Review Committee

Dr. Roger Mayer, Committee Chairperson, Doctor of Business Administration Faculty

Dr. Michael Campo, Committee Member, Doctor of Business Administration Faculty

Dr. Brenda Jack, University Reviewer, Doctor of Business Administration Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2022

Abstract

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by

Joyce W. Davis

MBA/MHA, Pfeiffer University, 2011

BS, North Carolina A&T State University, 1980

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

Walden University

December 2022

Abstract

Developing effective operational strategies in emergency departments (ED) is one of the most pressing challenges for hospital leaders. Key operational concerns include long wait times for patients, extended visit lengths, overburdened medical staff resulting in low throughput, and patients leaving the ED without receiving appropriate care. Grounded in complex adaptive system theory, the purpose of this qualitative multiple-case study was to explore ED operational strategies used by hospital leaders. Participants included 13 clinical and operational leaders from four hospitals in a healthcare network in North Carolina who developed successful ED operational strategies. Data were collected from interviews supplemented with organization documents. Yin's five-step thematic analysis process yielded four themes: triage operation strategies; wait-time protocol; use of technology; and communication among physicians, staff, and patients. A key recommendation is to increase face-to-face communication among physicians, staff, and patients to clarify the meaning of interactions. The implications for positive social change include the potential to increase the efficiency and availability of critical medical services to residents of local communities.

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Dedication

I would like to dedicate my doctoral study to my family for their support and love throughout this journey. A journey it has been and one that I will never forget. I dedicate the perseverance to my mother, who is no longer with us, for encouraging me to strive to be the best that I can. She always said that you can never get too much education and that is the one thing that no one can take away from you. To my siblings, thank for understanding the times when I could not always talk as long as we would like or to see you except briefly or on special occasions.

To my friends, thank you for not disowning me over the years when I missed out on our social gatherings, little talks, and even coffee breaks. Thank you for answering the phone when I did take a moment to say hi. To my Emmanuel Word church family, thank you for your encouragement during this task that God equipped me to complete. Your prayers and support are never ending.

To my son, Joshua, thank you for understanding the task before your mother and praying for her strength as my late hours sometimes surpassed yours. You showed me what it means to have challenges, big or small, during adverse situations. Nothing is easy that is worth having. To my beloved husband and pastor, Harry, I appreciate all your kindness, patience, and support during this mission. Thank you for reminding me to take a break, preparing our meals, bringing me something to drink, and picking up after me. You have been relentless in holding my hand when times seemed overwhelming. I appreciate you sharing our resting place with my laptop, notebook, and paperwork. Your prayers and love mean everything.

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Section 1: Foundation of the Study

A challenge for hospital leaders is improving the effectiveness and efficiency of health care services while maintaining quality requirements and cost restrictions (Kriegel et al., 2015). Hospitals that reduce patient wait time in the emergency department (ED) will reduce costs and increase patient outcomes (Kelley & Gravina, 2018). Thus, hospital leaders should explore practical ED operating strategies to enhance patient care efficiency (Pinsonneault et al., 2017).

Background of the Problem

The development of effective operational strategies in the ED is one of the chief challenges of-hospital leaders. Some of the issues faced by EDs include long wait times for patients, extended visit lengths, over-burdening of medical staff resulting in low throughput, and patients leaving the ED without receiving appropriate care, resulting in severe consequences, especially for patients with acute illnesses (Joshi et al., 2016). Most hospital EDs receive patients for treatment 24 hours per day, 7 days per week, and 365 days per year with no restrictions on who receives care (Alijani et al., 2015).

Understanding the impacts of changes in volume, mix, and complexity of patients is critical for aligning physician and staff incentives to improve patient care (Venkat et al., 2015).

Through a review of operational strategies hospital leaders may find opportunity for improvement to ensure that patients receive the best quality care in a safe and timely manner. Overcrowding of EDs often leads to increased wait time, delayed patient care, inappropriate care delivery (e.g., patients being treated in hallways), reduced patient

satisfaction, and decreased productivity among health care providers (Tang et al., 2015). Part of the review of operational strategies is ensuring that technology contains current patient information. Hospital leaders need to identify solutions that span several organizational forms, provide population-based information, and deliver personalized solutions for individual patients (Kane & Luz, 2015). ED services have to be in tune with the changing needs of daily operations based on varying volumes, complexity mix, and revenue potential.

Problem and Purpose

Some U.S. EDs have severe overcrowding problems that cause people to remain untreated or receive low-quality treatments due to the lack of time for individual patients (Bal et al., 2017). Every additional minute of wait time in the ED costs an organization an estimated \$1.27; reducing excess time can save money (Kelley & Gravina, 2018). The general business problem is that hospitals lose revenue and clinical care suffers when delays occur in the ED. The specific problem is that some hospital leaders lack effective ED operational strategies.

The purpose of this multiple-case study was to explore effective ED operational strategies used by hospital leaders. The population for this study included 13 participants from four separate hospitals in a health care network in North Carolina who had developed successful ED operational strategies. Hospital leaders can potentially use this study's results to effect social change by implementing operational strategies in the ED to increase efficiency and availability of critical medical services to residents of local communities.

Nature of the Study

For this study, I considered qualitative, quantitative, and mixed methods. The method is a plan that informs the investigator's collection, analysis, and interpretation of data (Dasgupta, 2015). Qualitative researchers seek to understand the *what*, *why*, and *how* of a phenomenon (Barnham, 2015). Quantitative researchers use numeric data to test hypotheses and form conclusions (Baglin et al., 2015). Mixed-methods researchers seek to understand and verify their research's theoretical foundations by combining quantitative and qualitative methods (Alavi et al., 2018; Salmon, 2016). It was not my goal to test hypotheses or conduct a detailed statistical analysis of numeric data. Therefore, I rejected both quantitative and mixed methods. My goal was to explore the what, why, and how of a phenomenon. Thus, I chose the qualitative method.

When deciding on a design, I considered case study, phenomenology, and ethnography. Researchers use a case study design to conduct an in-depth exploration of a phenomenon within a bounded system (Yin, 2018). Case study researchers incorporate different approaches for the collection and analysis of data (Ridder, 2017). They explore real-life phenomena within an environmental context (Ridder, 2017). Moustakas (1994) indicated that researchers use a phenomenological design to gain insights into participants' lived experiences. Ethnographic researchers go beyond observation and actively engage with participants to understand groups' cultures (Baskerville & Myers, 2015). I did not seek to explore the lived experiences or the culture of participants. Thus, I rejected phenomenology and ethnography. I explored a bounded system of ED operational strategies used by hospitals leaders. A multiple-case study allows for a more

robust exploration of phenomena (Mojtaba & Nonino, 2017). I, therefore, chose a multiple-case study design as the most appropriate design for the study.

Research Question

What effective ED operational strategies do hospital leaders use?

Interview Questions

1. What operational strategies do you use in your ED?
2. What approaches do you use to identify problems and solutions with operational strategies in the ED?
3. How do you mitigate the number of patients leaving before treatment begins or complete in the ED?
4. How do you track the wait time of patients in the ED?
5. What training have you provided to the ED staff about operational strategies?
6. What communication strategies do the ED physicians and staff use?
7. How do you use technology in the ED to increase the effectiveness of the ED operation?
8. Based upon your hospital's experience, how do you triage patients in the ED?
9. What additional comments do you have about ED operational strategies?

Conceptual Framework

This study's conceptual framework was the complex adaptive system (CAS) theory developed by K. E. Weick in 1985. The CAS model provides a framework for researchers and practitioners to locate problems and find solutions (Hodiamont et al., 2019; Weick, 1985). A CAS is a collection of diverse interconnecting parts that enable an

organization to grow without solid centralization of control and that facilitate its components' adaptive interactions (Kitson et al., 2018; Lehmann, 2018).

According to the CAS framework, individual agents cohere to a common purpose (Sweetman & Conboy, 2018). A complex system interacts and exchanges information with the changing environment, where key inputs lead to significant changes (Sweetman & Conboy, 2018). CAS researchers seek to understand the project portfolio dynamics of project-based organizations; such dynamics include autonomy, cooperation, aggregation, and self-organization (Sweetman & Conboy, 2018). The CAS framework was appropriate for this study because I sought to understand the complexities of ED operational strategies.

Operational Definitions

Information technology (IT): In the context of this study, technology that connects doctors and patients to more complete and accurate health records (Quang et al., 2018).

Leadership: The duty, management, and methods leaders use to assure an organization's success (Allameh et al., 2016).

Operational services: The movement of patients between various activities, each requiring a unique set of resources and consuming time (Bard et al., 2016).

Teamwork: Teamwork is an adaptive, dynamic, and episodic process that encompasses the thoughts, feelings, and behaviors among team members while interacting to achieve a common goal (Salas et al., 2015).

Assumptions, Limitations, and Delimitations

Assumptions

An assumption is a position that a researcher takes until finding evidence that either supports or discredits the position (Simonson, 2016). Simonson (2016) defined assumptions as ideas that are formed without evidence and are taken for granted. I had three primary assumptions when conducting this study. The first assumption was that participants would provide truthful information. The second assumption was that ED staff have the necessary tools to accommodate care for the patient. The third assumption was that the ED staff use appropriate operational strategies to provide effective patient services.

Limitations

Limitations are constraints outside the researcher's control that may affect the research (Moed & Halevi, 2015). Limitations include features of the research that are beyond the control of the researcher (Salkin, 2018). The general limitation for this study is that participants may not have presented best practices in their interview responses. A change in the Health Insurance Portability and Accountability Act of 1996 (HIPAA) or other regulations could also change how the ED operates; thus, the findings may reflect ED leadership practices at the time of the study and not more current practices. The final limitation was that participants might have been biased in favor of their employer organization.

Delimitations

Delimitations are constraints that a researcher defines for their investigation (Wegerer, 2018). The first delimitation for this study was the small number of participants who had effective operational strategies in EDs. The second delimitation was the number of participants for each case. The third delimitation was the geographical location of the community that the area facility serves.

Significance of the Study

ED operational strategies affect patients' health and satisfaction. The delivery of patient care in an ED also impacts the health care facility's financial sustainability. Developing ED operational strategies is a significant challenge for health care leaders as they focus on operational efficiency and quality of care (Sharafat & Bayati, 2021). The results of this study could contribute to business practices and impact social change by identifying operational strategies that hospital leaders can use to increase the effectiveness and efficiency of the ED.

Contribution to Business Practice

Hospital leaders could benefit from this study's results by identifying effective operational strategies that increase hospital revenue. Analyzing barriers and implementing cost-effective strategies may enhance the effectiveness and efficiency of hospital operations (Hampton, 2018). The study could generate ideas for hospital leaders struggling with operational strategies in the ED to increase patient care.

Implications for Social Change

Local communities could benefit from improved operational strategies in hospital EDs. Delays in patient care and unnecessary wait times exacerbate pain and discomfort for patients (Wright et al., 2017). Social change may come from increased attention and clinical support for community members, especially those at the margins who rely on ED treatment for diagnosis and administration of necessary clinical treatments.

A Review of the Professional and Academic Literature

In the literature review, I explore the study topic, focusing on previous researchers' findings. A literature review is an analysis that encompasses several dimensions of research, including (a) general data analysis, (b) research perspectives, and (c) content analysis (Mikelsone & Liela, 2015). In the literature review, I analyze research on IT, management structure, and social involvement. This information helps the reader to understand the scope of the research. The purpose of this multiple-case study was to identify and explore effective operational strategies in EDs. In the review of the professional and academic literature in this section, I elaborate on the theories that provided a framework for the study.

To find articles, I used the following Walden University Library databases: Academic Search Complete, ABI/INFORM Collection, Business Source Complete, Dissertations & Theses at Walden University, Education Source, Health and Psychosocial Instruments, ProQuest Central, ScienceDirect, SAGE Journals, and Ulrich's Periodicals Directory. The Agency for Healthcare Research and Quality's Healthcare Cost and Utilization Project was another resource that I used, as was the search engine Google

Scholar. I In conducting these searches, I sought to narrow my searches to effective ED operational strategies.

Researching a study requires several components. As integral components of science, concepts and definition statements are essential in laying the groundwork upon which understanding is developed (Solomon & Steyn, 2017). In line with the study purpose, I used keywords including *leadership*, *operational strategies*, *teamwork*, *electronic medical records*, *emergency medicine*, and *information technology* in my searches. I cite 207 sources throughout the capstone.

The literature review begins with a comprehensive review of the conceptual framework. In the next section, I discuss alternative theories that help support the study. After I review my conceptual framework, I then provide an application of literature to my research question. The final sections include the role of emergency medicine in the U.S. health care system and emergency medicine operational issues.

Complex Adaptive System Theory

I used CAS as the conceptual framework for this study because it was helpful in understanding effective ED operational strategies. Using CAS theory, Dooley (1997) articulated how interacting agents such as organism adaptation and co-evolve over time in spontaneous ways. Holland (1995) defined CAS as a system composed of interacting agents, which undergo constant change, both autonomously and in interaction with their environment. The ED constantly faces health care challenges. A CAS is a collection of interrelated components that work together toward some objective, which can include large, macro, or smaller in sub-systems (Slaper, 2019). How knowledge is creatable and

mobile within social CASs is determined by the relationships and shared understandings of the benefits and incentives for that knowledge's movement (Kitson et al., 2018). Grasping an understanding of operational strategies in the ED will enlighten challenges faced by hospital leaders.

Embedded in the CAS are functional processes. Hartman (2016) found co-evolutionary and path-dependent processes in a complex and potentially adaptive system. To overcome the limitations, which focus on the diffusion of existing innovations, theorists employ a CAS perspective to address how innovations emerge and are sustained (Nair et al., 2016). Employing the CAS in cities, co-evolution means that physical infrastructure, social structures are influencing each other. Specific processes reinforce each other by creating path dependencies bound to different infrastructure types (Butsch et al., 2016). Infrastructure is essential for the operation of the organization to function correctly.

By their nature, complex systems are challenging and hard to understand. Bohórquez Arévalo and Espinosa (2015) stated that complexity increases as the system emerges and evolves in response to external and internal stimuli. Butsch et al. (2016) found that changes in the system are dynamic and unforeseeable due to the high number of inter-linkages and feedback mechanisms. Minimal changes can trigger maximum changes. Eventually, these dynamic systems will produce stable patterns and structures as external influences stabilize (Bohórquez Arévalo & Espinosa, 2015). Thus, understanding where a system is in the system life cycle is critical to an examination.

Historical Development of Complex Adaptive Theory

Researchers have developed a framework to help understand complex systems. Arthur (1994) identified complex system characteristics, including dispersed interaction, the absence of central control, cross-cutting hierarchical organizations, continual adaptation, perpetual novelty, and far-from-equilibrium dynamics. Hierarchy and scale in CASs refer to each system made up of a mosaic of other complex adaptive subsystems that are a makeup of other complex adaptive subsystems (McGreevy & Wilson, 2017). A central principle of complex systems is that they are scalar and hierarchical (Mitchell, 2009). Organization arises from microbehavior that is dispersed among individual agents who cooperate and compete to survive and flourish, allowing CASs to gain spontaneous order and self-organization (Holland, 1995; Johnson, 2004; Mitchell, 2009). The organization represents the sum of individual components, which explains the complexity of systems.

CASs are a special kind of self-organizing system with emergent properties and adaptive capacity. A complex system remains efficient if the system can adapt to changing external conditions (Kim & Mackey, 2014). CAS allows planners to engage in a meaningful way with a constantly changing system (Nel et al., 2018). CASs interact with the environment, learn autonomously from their experience, and modify their behaviors to adapt to external changes (Rammel et al., 2007). Although researchers describe the system as autonomous, the reality is that leaders are the driving force of change in an organization.

CASs include individuals who act and interact with one another in unpredictable ways. Glass and Bloom (2016) suggested that a CAS emerges through individual actors' self-organization. These individual group members produce emergent actions as they oscillate between stability and instability (Plowman et al., 2007). One of the characteristics of CASs leading to emergent behavior is self-organization, which many researchers have suggested is the critical concept drawn from complexity theory.

Leadership Roles in the Complex Adaptive System Framework

Leadership roles in the CAS can impact the organization. Schneider and Somers (2015) proposed that leadership in a CAS framework might indirectly affect the organization through the mediating variables of organizational identity and social movements. Health care leaders can improve their organization by understanding the potential barriers it may encounter. The message of leaders and the means by which they communicate their vision of the future are key factors (Carton et al., 2015). Complexity theorists have promoted a reexamination of leadership, as much of the leadership lexicon developed under general systems theory (Schneider & Somers, 2015). Thus, adjusting to change in an organization depends on the skills of leaders.

Researchers who have used the CAS have argued that the supply network as evolving. When companies make choices related to survival, they must evolve to adapt to new circumstances (Pathak et al., 2007). Olson and Eoyang (2001) argued that in CAS, a formal leader has three jobs: to set the container, focus on the significant differences, and foster transforming exchanges. In this study, Olson and Eoyang found that the leadership team nurtured staff differences to develop effective operating strategies. Dickens (2016)

found that a CAS is challenging to lead because of the characteristics of multiple players in the systems. Leaders need to consider the organization from a holistic perspective as they lead an organization through complexity.

Micromanaging employees is not the best way to lead in a complex system. However, some leaders believe that the best way to lead is by controlling people in a detailed way, including being the person who predicts the future and picks the strategy (Houglum, 2012). Conversely, Psychogios and Garev (2012) argued that there are drawbacks in a CAS where employees cannot self-organize and explore alternative strategies. Leaders must understand that allowing employees flexibility will benefit the organization.

Researchers have highlighted the complexity of organizations. Geer-Frazier (2014) stated that leaders must shift away from viewing their organizations as machines and view them as complex knowledge centers that can generate innovation, learning, and adaptation. Maillet et al. (2015) stated that for professionals, researchers, and administrators to gain more targeted outcomes from adaptation, they need to elicit participation from various stakeholders. Leaders should focus on the consequences of the organization's complex nature (Belrhiti et al., 2018). Conversely, conditions may be less favorable when influenced by various factors, such as budgetary cuts, lack of personnel, centralization of power, and resistance to change (Maillet et al., 2015). In the health sector, where innovation is now high on the policy agenda in many countries, there is a paucity of research on how leadership can foster a culture of innovation (Weintraub & McKee, 2019).

Facilitation of Change Using Complex Adaptive Theory

The capital structure reinforces that capital assets are also a CAS. These assets include complex, adaptive, modular, stratified, and knowledge-generating resources (Harper, 2014). LePoire (2015) found that continuous logistic learning can explore scaling other dimensions of essential processes in CAS. As an emerging research area in the new product development literature, CAS theory provides a framework for explaining the emergence of system-level order arising from the interactions of the system's interdependent agents. Leaders of complex systems focus on the interplay between a system and its environment (McCarthy et al., 2006). Scholars have argued that examining product innovation through a CAS lens is particularly relevant as new product development efforts are complex, iterative, nonlinear, and co-evolutionary (Garud et al., 2011).

Leaders of a health care facility must implement positive change so that it can serve the community in which they house. Enabling conditions are the necessary settings in which complex behaviors and dynamics occur in product development efforts (Baltaci & Balci, 2017). Akgun et al. (2014) found that the CAS context and emergence are essential for developing successful new products, specifically management understanding the diverse knowledge, skills, and outlooks. Marchi et al. (2014) found that the CAS view might amplify the actors, resources and activity on a network model's dynamic capability by including behaviors and effects into the future. Allowing space for addressing unforeseen circumstances increases a promising outcome.

Problems can be confrontational through CAS, encouraging economic innovation, anticipating changes in global trade, understanding markets, and preserving ecosystems (Holland, 2006). For instance, McCarthy (2003) used CAS to explain a technology management model. Rammel et al. (2007) utilized the CAS to build an agenda for natural resource management. Essential elements of CAS models can help shape organizational systems with schemas, self-organizing networks supported by energy imports, systemic evolution, and recombination (Anderson, 1999). The CAS behavior provokes, in the system, effects, characteristics, and different orders as emergent novelties.

What emerges in a complex system is not always positive. Behaviors and characteristics can be contrary to the system, meaning that the whole may be smaller than the sum of its parts (Morin, 1990; Stacey, 1995). The emergent result refers to the combined and synergistic effects of parts; however, it does not refer to the sum of individual results. It occurs that individual performance could give power or mitigate other performance. The butterfly effect is an example of nonlinear effects that CAS may exhibit, which results in extreme events provoked by small actions (Lorenz, 1963). The effect can originate from numerous interactions of positive or negative feedback by agents and nonlinear behaviors, among other small events included in CAS, making it difficult to forecast (Wycisk et al., 2008). Leaders recognize that the complexity of a system may result in negative outcomes.

Successful leaders encourage a degree of diversity among organization members to increase innovations, learning, and reflexivity. Francesconi and Dossena (2016) found that agents must have some level of autonomy and the ability to process information and

adapt their behavior in a complex system. At the same time, Francesconi and Dossena found that innovation in the CAS view is evolutionary. Hartman (2016) found that the CAS perspective draws attention to the importance of diversity in terms of products and experiences. In the context of sustainable tourism, the CAS perspective could help avoid decline and the loss of resources invested in tourism infrastructures and stimulate the pursuit of innovations by entrepreneurs in promising niches such as eco-tourism, sustainable tourism, and community-based tourism (Hartman, 2016).

Complex systems do not remain in a state of stasis. McGreevy and Wilson (2017) found that CASs evolve and change due to internal and external stimuli. The creation of new orders is not explicable from a purely reductionist viewpoint but that the whole is greater than the sum of the parts (Kauffman, 1993). A CAS exhibits learning, self-organization, emergence, and co-evolution (Francesconi & Dossena, 2016). The CAS is adaptive because different elements interact with the environment, learn from the experience, and adapt to events as a result (Gell-Mann, 1995). Insufficient information process may be due to the time lag between the influence of surroundings on actions and vice versa (Næss, 2015). Organizations learn from experience even though they suffer from imperfect information processing.

A CAS creates nonlinear dynamics and growth versus constant bifurcation, which evolves diversity and mass beyond what would be possible without the relationships made possible by networked connection (Allen, 1997). One of the ways that coherence could emerge is by applying minimum specifications to the system, therefore, are the simple rules that guide self-organization (Dickens, 2016). Taking a CAS perspective

implies that regional economies must be understood as broad and diverse entities driven by the decision-making of an array of different individual actors: firms, policy makers, labor, consumers, and civil society (Bristow & Healy, 2014). The complexity of CAS emerges from the unexpected dynamics characterizing these systems. More commonly, CASs are definable by pointing to certain features that they share. For the purposes of this study, these can be summarized as (a) dispersed interaction between many heterogeneous agents, (b) leading to emergent, self-organized collective behavior, (c) having no global controller, and (d) continual adaptation with out of equilibrium dynamics (Arthur et al., 2018). The retention of CAS can potentially influence the environment through mechanisms, such as diffusion and imitation (Chae, 2014). Chae (2014) found that as a result, a population of similar CAS is likely to grow, leading to the diffusion of similar kinds in the population level.

Characteristics of Complex Adaptive Systems

Making CASs robust and resilient allows the organization to ride out upheavals and difficult circumstances. Ecosystems are CASs that contain a diversity of biotic agents along with abiotic elements, which in combination create systems of rich and exquisite complexity (Collins et al., 2000). As an organization adapts, it may change in unpredictable ways (Loreau, 2000). Characteristics of CASs include resources that drive the level of complexity.

Not every emergent adaptation increases the system's chances of survival. A CAS lens might reveal quite a different means of attitude formation than a more conventional construct measurement and linear causality regression (Porter & Zivanovic-Nenadovic,

2014). When the new order is one of greater 'fitness' that improves the fitness of the entire system's resilience, the system is said to be adaptive, or a CAS (Kauffman, 1993; Rihani, 2002). Robertson (2016) assumed that agents interact to generate patterns of behavior, discourse, and expectations in CASs. An agent within the system can look for those patterns, name them, interpret them, and generate options for action that may potentially shift those patterns. The CAS perspective holds significant potential to generate useful insights into the meaning and determinants of regional economic resilience, particularly given its capacity to align with evolutionary thinking around how economies develop and grow over time (Bristow & Healy, 2014). Bristow and Healy (2014) found that CASs improve through decentralization and localization interactions between their diverse range of constituent agents.

Taking a CAS perspective implies that regional economies must be understood as broad and diverse entities driven by the decision-making of an array of different individual actors, including firms, policymakers, labor, consumers, and civil society (Bristow & Healy, 2014). CAS is grounded in models developed by examining simulations in computers and in scientific domains of physics, chemistry, and biology, where the instruments are honed for many years by technology, applications, and reductionist peer review (Best, 2014). Best (2014) noted that researchers who closely examine models and adopt a hypothetic-reductionist lens (vs. traditional methods of inquiry) gain a deeper understanding of human systems.

Social-Ecological Systems

Facing the current socioeconomic contingency while guaranteeing a high level of care quality is particularly challenging in the field of health care (Crema & Verbano, 2017). Coetzee et al. (2016) found the inherent similarities between the concept of resilience and CAS could provide ample practical and theoretical contributions to the field of disaster risk studies and therefore warrants further investigation (Coetzee et al., 2016). A better understanding of disaster resilience and its underlying dynamics, as illuminated by the application of CAS and hazard, could provide an effective tool to manage disaster risks and build resilience (Coetzee et al., 2016).

Complex adaptive systems contain a multitude of characteristics and elements that could assist in attaining a more nuanced understanding of disaster resilience (Coetzee et al., 2016). CAS would allow disaster scientists and practitioners to treat the issue of resilience as an open-systems process that is constantly changing due to the inflow and outflow of information and building and breaking up of components that constitute the resilience profile of a community (Coetzee et al., 2016). Adopting a CAS approach to deciphering the complexity of resilience could have practical application in reducing disaster risk and creating contextual, relevant resilience-building policies and programs (Coetzee et al., 2016). The alternative perspectives offered by CAS may better reflect the complex and changing nature of health systems and create new opportunities for understanding and scaling up health services (Sarriot & Kouletio, 2015).

Overcrowding often leads to increased wait time, delayed patient care, inappropriate care delivery such as treating patients in hallways, reduced patient

satisfaction, and decreased productivity of health care providers (Tang et al., 2015). Most early studies attributed the ED overcrowding problem to a shortage of resources (Tang et al., 2015). Many studies found that inpatient bed shortage often forced an ED to board inpatients until a bed was available in the inpatient unit (Tang et al., 2015). Patient logistics, as a cross-departmental organization and optimization approach, offers the possibility of improving the quality of care and the use of resources in hospitals (Kriegel et al., 2016). The identification of relevant challenges and solutions to optimize the current and future development of patient logistics in Bavarian and Austrian hospitals is through the knowledge of the current objectives and applied tools and indicators (Kriegel et al., 2016). Therefore, possible influencing factors were collectible in literature research in relevant national and international search engines (Kriegel et al., 2016).

Work on health system development can draw on a substantial body of work, which applies the lens of resilience thinking and CAS to studies of changes in social-ecological systems (Zhang et al., 2018). Zhang et al. (2018) suggest that an awareness of CAS concepts for understanding system behavior can provide a useful tool for analyzing the likely response to different policy interventions. The government increases its capacity to manage complex processes to create a resilient health system (Zhang et al., 2018). The conceptualization of district health systems as CASs has implications for evaluating health care interventions. Prashanth et al. (2012) found that districts are sensitive to dynamic, contextual factors as well as their initial conditions, which accounts for different outcomes of the same policy or program.

Territories can be considered as self-organized complex systems created by not only the interactions between the various elements of social, cultural, economic, and political but through the interactions these elements have with relevant stakeholders (Basile et al., 2016). While all metropolitan areas are CASs, some are considered chaotic or controlled by mechanical order (McGreevy & Wilson, 2017). McGreevy and Wilson (2017) found that by understanding the city as a CAS, one sees a major part of the city's strength, resilience, and dynamism lying within the mosaic of subsystems that form it. Hierarchy and scale in CASs refer to each system makeup of a mosaic of other complex adaptive subsystems that are from other complex adaptive subsystems (McGreevy & Wilson, 2017). Another CAS context variable that affects emergence is the complex pattern of conflicting constraints (Akgun et al., 2014).

Although the dimensions feature of conflicting constraints seems undesirable from the traditional management perspective, they are critical and desirable from the CAS perspective because they foster coordinated actions and interdependencies among people (Akgun et al., 2014). The social-ecological systems (SES) perspective is in relation to the CAS perspective but focuses more on the assessment of vulnerability and resilience (Butsch et al., 2016). Nair et al. (2016) stated that the dynamism of the external environment and the uncertainties associated with the development of innovations add to the complexity already inherent in a supply network. The CAS view differs from the diffusion of innovation (DOI) perspective in that it makes no a priori assumptions about a decision maker's ability to influence an environmental innovation's evolutionary path (Nair et al., 2016). In addition to the diffusion of such innovations in a network, which is

the focus of the DOI perspective, the CAS view seeks to understand how macro-phenomena such as environmental innovations emerge from and are simultaneously influenced by the micro-level actions and interactions of myriad agents (Nair et al., 2016).

Bohórquez Arévalo and Espinosa (2015) found that the lack of recognition of differences between complexity management approaches might have the root of (a) misinterpretations, (b) critiques, and (c) confusion. Order cybernetics, reformulated as observing systems, was inadequate to deal with the complex adaptive social systems. A complex system could adapt to its environment and thus becomes a CAS (Murthy & Kummamuru, 2014). Complex adaptive systems are the best example of this new trend in complexity science that allows, for the first time, modeling and visualizing complexity through very advanced computer techniques (Malaina, 2015). Malaina (2015) found that CAS launched approximately since the foundation of the Santa Fe Institute in 1984, is an emerging scientific field that is increasingly gaining academic recognition.

There is a worldwide proliferation of interdisciplinary institutes and scientific journals dedicated to the study of CASs (Malaina, 2015). CAS fits the first-order cybernetics, becoming a science of the observed CASs from which is expurgated the epistemological problems made evident by the second-order cybernetics and by complex thinkers such as von Foerster, Varela, Maturana, Luhmann, or Morin (Malaina, 2015). Port managers may find it useful to conceptualize their ports as CAS to understand the complexity of change and organizational dynamics. Justice et al. (2016) suggested that the application of the CAS conceptualization might be a useful means for port managers

to manage complexity. Rather than port managers relying solely on more formal approaches, there may be advantages in conceptualizing a port as a CAS where self-organization may assist in better managing ports for resilience, and hence sustainability in a complex and dynamic environment (Justice et al., 2016). Port managers may find it useful to conceptualize their ports as CAS to better understand the complexity of change and organizational dynamics (Justice et al., 2016).

An organizational system can be described as a CAS (Zegarra & Alarcón, 2017). Waddell (2016) found that some key logics associated with CAS work are self-organizing, vacuums filled quickly, and there is always some type of response to new needs and emergence: many responses to address wicked problems gradually form innovative patterns of relationships and structures that represent organizing inventions. The innovative quality is not visible by the use of traditional lenses such as organizations and directional nudges, which is the impact of interventions to address wicked problems that cannot be predicted, and they often have unintended negative impacts. This favors multiple modest efforts intended to move in a direction, rather than efforts toward a goal in the traditional planning sense and learning and experimenting to realize sustainable energy for all is highly dependent on context and requires invention. Rollout strategies do not work. Analyzing wicked mobility problems as CAS and as actor-networks makes it possible to explain apparent contingent and volatile changes more thoroughly and therewith find solutions beyond the current conceptions.

Changes in organizational structures can be confusing when deciding what structure is a better fit. In regards to a sustainable mobility system, a CAS within the

greater societal/environmental system, but also on micro-level, because it consists of various volatile features that influence each other continuously (Van Brussel et al., 2016). Comparing CAS among various facilities that fall under one organization can result in not using it at all. Two municipal health systems in Saidpur and Paratipur, Bangladesh, and the nongovernment organization, Concern Worldwide, Inc. serve as an example of a complex adaptive health system's behavior during and after a partnership and capacity-building intervention that resulted in demonstrated sustainable outcomes on population health indicators (Sarriot & Kouletio, 2015). There may be different phases of a CAS that can accommodate all facilities depending on what part fits the facility. The alternative perspectives offered by CAS may better reflect the complex and changing nature of health systems and create new opportunities for understanding and scaling up health services (Sarriot & Kouletio, 2015). Complex adaptive system researchers recognize that dynamic changes and nonlinear causality defy deductive rationality because there cannot be a logical solution to a problem that is not logically defined (Arthur, 2014). Implementing a CAS can logically define a solution to a logical problem.

Engineered Complex Adaptive Systems

Engineering a CAS may influence behavior within an organization. Engineered CASs exhibit the inherent behaviors of natural CAS but are designed for expressed purposes and include intrinsic design parameters and operational controls that can influence behavior (Haghnevis et al., 2016). CAS theory arises from the study of changes caused by interactions among elements in a system (Arthur, 2014). Changes in an organization can enhance productivity by getting to the root of the problem. Ning and

Tanriverdi (2017) suggested that CAS research embraced nonlinear dynamic changes and looked into interactions as the root of these changes. Removing antiquated systems that are no longer effective increases the opportunity for a better environment in health care. In addition to its dynamic and nonlinear perspective, CAS theory is well suited because it explicitly focuses on the role of information (Ning & Tanriverdi, 2017). Although conflicts are detrimental to firm-centric optimization, they can be constructive for adaptive behaviors because conflicts can destabilize a CAS and thereby encourage firms to combine exploration of alternatives and compromises to resolve the disputed combinations of productive means (Albert et al., 2015). Reliable control of system performance in CASs is notoriously difficult (Day, 2014). Difficulties in CAS may be difficult at times but can prove effective.

The dynamic of all CASs is that they produce enormous collective intelligence and abilities arising from, in many cases, the agglomeration and interconnection of otherwise quite simple agents making relatively simple decisions bound by relatively simple rules (McGreevy & Wilson, 2017). McGreevy and Wilson (2017) found that hierarchy and scale in CASs refer to each system made up of a mosaic of other complex adaptive subsystems that are a combination of other complex adaptive subsystems. Forrest and Mitchell (2016) found that in the early 1980s, John Holland teamed up with a small group of scientists, primarily physicists, with a sprinkling of economists and biologists, to discuss what properties this wide swath of CAS has in common. Forrest and Mitchell additionally found that, in Holland's view, adaptive systems never achieve a state of equilibrium or final optimum configuration. Adaptive systems create, update, and

use internal models of their environment to make predictions; successful models create valid homeomorphisms of their environment (Forrest & Mitchell, 2016).

Basile et al. (2016) interpreted that multilevel CAS are interactions between agents that can analyze at different levels. Another relevant characteristic of CAS is their tangled composite structures allow the outline of several levels of analysis and highlight a number of semiautonomous processes. In CAS, cause and effect are not always evident before being observed, and such relationships may not be repeated (Day, 2014). Day (2014) found that it is not just the ability to adapt CAS that is important, but also the speed with which entities sense and respond to changes. A CAS works better when a few essential elements are identified, and the rest is up to the system agents (Glass & Bloom, 2016). That began a story of emergence. Glass and Bloom (2016) found that the emerging of a leadership team and division using solution focus (SF) questions grew and manifested elements of a CAS. Sometimes they worked within the controlled space of a traditional organization, and at others, they created some emergent properties of a CAS, which helped the division progress (Glass & Bloom, 2016).

McGreevy and Wilson (2017) found that the dynamic of all CASs is that they produce enormous collective intelligence and abilities arising from, in many cases, the agglomeration and interconnection of otherwise quite simple agents making relatively simple decisions bound by relatively simple rules. Within all CASs, there is no architect, choreographer, or divine force controlling the organization (McGreevy & Wilson, 2017). In CAS, one-way coherence could emerge through the application of minimum specifications or “min specs” to the system (Dickens, 2016). Mathematical modeling of

CASs is fragmented and inapplicable because engineers and mathematicians focus on purposes and outcomes while complex systems are strongly characterized by the emergence in behaviors of components and evolution in behaviors of a system (Haghnevis et al., 2016).

CASs are found in a variety of fields and display a range of common emergent phenomena. A feature of CAS includes bifurcations or transitions (LePoire, 2015). Characteristic properties of CASs might include (a) a resource that drives the level of complexity, such as energy flow, (b) new options at critical nonlinear decision points along development paths, (c) and other linear learning to explore as options (LePoire, 2015). Additional characteristics might include (a) an initial increase in the rate of change, (b) a potential later reversal in the rate of change towards a bounding logistic pattern, and (c) scaling of other dimensions besides the driving order parameter such as length and time scales of essential processes (LePoire, 2015). Mechanisms of CAS are the dynamic behaviors, processes, and practices that occur within the product development efforts to leverage the firm innovativeness (Akgun et al., 2014).

Akgun et al. (2014) stated that a model of CAS behavior should precisely state how to measure the relevant constructs, the relations of constructs, and how certain mechanisms affect those constructs. The CAS view might contribute to and amplify the dynamic capability of the actors, resources and activity on a network model by including behaviors and effects into present-future relationships in supply networks, increasing the space for predictability and possibilities (Marchi et al., 2014). The CAS view can see an intertwined relationship between cooperation and competition, in which disputes,

agreements, and alliances change the process from static to dynamic, adaptive, and co-evolutionary (Marchi et al., 2014). Francesconi and Dossena (2016) argued that the potential benefits of taking a CAS viewpoint are as much theoretical as analytical and practical (Francesconi & Dossena, 2016). A CAS is able to live on the edge of chaos, doing so by constantly learning, exploring, and adapting (Francesconi & Dossena, 2016). Hartman (2016) found that next to conceptualizing tourism areas as complex and potentially adaptive systems, there are theories of CAS to show how tourism area development can be understood as a multilevel, co-evolutionary, and path-dependent process.

Chae (2014) found that from complexity theory, the environment is the emergent structure developed from the interaction of various CAS such as providers, customers, regulators, technology trajectories, scientific trends, market needs. Adaptation is vital for CAS to survive in the rugged fitness landscape, which continues to change (Chae, 2014). The elements of a CAS possess internal performance criteria for selection, while external sources can influence what will or will not flourish (Chae, 2014). Bristow and Healy (2014) found that one of the definitions of regional economic resilience is in relation to an adaptive notion of resilience, which derives from the theory of CAS. Bristow and Healy (2014) found that CAS thinking has been evolving for a considerable time and is applicable to psychology, biology, cybernetics, anthropology, and the natural sciences.

Butsch et al. (2016) found that megacities are viewable as CAS characterized by the three axioms of chaos theory. Butsch et al. (2016) stated that the three chaos-theories are (a) the dynamics of these systems is unforeseeable due to the high number of inter-

linkages and feedback mechanisms, (b) minimal changes can trigger maximum changes, and (c) such dynamic systems will start to produce stable patterns and structures if the external influences remain unchanged. The complexity of CAS emerges from the unexpected dynamics characterizing these systems. In a CAS, co-evolution makes it impossible to foresee all possible developments (Butsch et al., 2016).

Alternative Theories

Complexity theory is a way of offering different concepts in how organizations can increase the functions within the organizations. There are other alternative theories, which can offer significant results to organizational structure. I chose systems theory and contingency theories in management to better understand my business problem. A system theory can be definable as any object of study that, although consisting of different elements mutually interconnected and interacting with each other or the external environment, reacts or evolves as a whole with its own general rules (Andretta, 2014). The logic of systems theory, the outcomes of innovations, both intended and unintended, may be varyingly located vis-à-vis the organizational environment (Moldogaziev & Resh, 2016).

Systems Theory

The first theory that enhances my understanding of complex systems is systems theory. A system theory of dynamics is an approach to analyze the behavior of complex systems, such as the productive chains, strictly considering the inherent characteristics (de Hoyos Guevara et al., 2017). Moldogaziev and Resh (2016) stated that organizational members of the technical core would be better equipped to identify strengths,

weaknesses, opportunities, and threats to implementing a given innovation if that innovation changes processes and results within that locus of the organizational environment. The emergent properties of the economic and other social systems capsule by recasting the concept of responsibility as the individual level or organizational-level projection of the environmental sensitivity of moral communications (Valentinov et al., 2016). Chatterjee et al., (2015) found that a traditional system's verification and synthesis problems are studied with respect to Boolean specifications in an adversarial environment of specifications mapping each possible behavior of a system to true or false, indicating if this behavior is the desired behavior or not. Andretta (2014) found that the constituent elements of a system, the subsystems, are to interact when the behavior of one of them influences the others. The reciprocal influence occurs through exchanges of energy, matter, or information.

Analyzing a system in an adversarial environment corresponds to considering the system under the worst-case behavior of the environment (Chatterjee et al., 2015). A system theory can be definable as any object of study that, although consisting of different elements mutually interconnected and interacting with each other or the external environment, reacts or evolves with its own general rules (Andretta, 2014). System theory suggests that events become salient when they are novel, disruptive, and critical, which reflects an event's strength (Morgeson et al., 2015). Morgeson et al. (2015) stated that events could originate at any hierarchical level, and their effects can remain within that level or travel up or down throughout the organization, changing or creating new behaviors, features, and events.

Contingency Theory

Management theorists, following a systemic approach in exploring the social realm, often explain phenomena and their complexity through analogical reasoning that builds on patterns observed in natural, mechanical, and, in general, non-socially constructed systems (Poulis & Poulis, 2016). The law of requisite variety (LRV) posits that a system's viability is dependent on its capacity to confront an external variety and complexity with an internal one (Poulis & Poulis, 2016). Contingency theory considers the organization systemically as an interacting network of functional elements bound together in pursuit of a common purpose (Karim et al., 2016). The theorists' results refined and extended contingency theory and studies of organization design by drawing on theories of decision avoidance and delay to describe environmental conditions when firms pursue or postpone structural realignment (Karim et al., 2016). Williams et al. (2016) found that early theorists moved away from the traditional management approaches of there being one best way to manage and structure organizations.

Theorists contended that the best structure was contingent upon the environment in which the organization existed and suggested that there was an environment–structure–performance relationship for most organizations (Williams et al., 2016). Contingency perspective provides a useful lens to evaluate past production planning and control (PPC) studies and thoroughly review lean research, creating the opportunity to develop an integrative paradigm that may facilitate the empirical examination of their combined effect on operational effectiveness under high levels of demand fluctuations (Hong & Leffakis, 2017). The contingency theory frames the adaptation structure necessary to

make adjustments in strategies (Junqueira et al., 2016). Contingency theorists suggest that size effects are relevant for many operations management practices, and extant studies confirm this to be true for practices such as total quality management, lean, and business process reengineering.

Contingency theory serves as a theoretical lens to interpret and discuss the findings, as well as theoretical and managerial implications (Müller et al., 2017). Nedaei et al. (2015) found that despite new trends in research that illustrate that an organization's ERM system is part of its management control system, few studies have addressed the contingency theory of enterprise risk management (ERM). According to the contingency theory, there is no single best way to structure organization organizational decisions because of rational considerations about the costs and benefits of different possibilities (Abt & Knyphausen-Aufseß, 2017). Theorists found that based on the contingency theory, chief human resources officer (CHRO) presence is more beneficial and, therefore, more likely when critical areas of the HR domain are more complex and uncertain (Abt & Knyphausen-Aufseß, 2017).

The Role of Emergency Medicine in the U.S. Health Care System

Emergency financial management is a relatively recent and unique form of municipal governance that is designed to address local fiscal crises by concentrating the decision-making power in the hands of a temporarily appointed chief executive (Clark & Gorina, 2017). A state mandate to improve local fiscal conditions and independence from voter control are two unique features of emergency financial management that set it apart from the conventional forms of municipal governance (Clark & Gorina, 2017). The

appointment of an emergency financial manager (EFM) is politically costly and is often viewed as a threat to local democracy (Clark & Gorina, 2017). An assessment of the outcomes of EFM is important for determining whether the benefits justify the costs and for legitimizing emergency financial management as a governance tool if it is found to be effective (Clark & Gorina, 2017).

Financial Management

Patients utilizing the ED frequently have become an increasing concern to hospitals across the nation as inconsistent care for patients and increased care costs for patients, hospitals, and insurers (Gerhold et al., 2017). Minnesota Health Care Program's study concluded efforts towards educating patients regarding available alternative services and addressing non-financial barriers such as transportation, childcare, and social situations would help reduce frequent ED visits (Gerhold et al., 2017). A case management program for frequent ED use patients improves the quality of care and services by emphasizing patient involvement and empowering patients to seek medical care in the most appropriate health care setting (Gerhold et al., 2017).

The education and training of paramedics largely remain focused on emergency medicine dominated curricula with limited attempts made to expand paramedic education (O'Meara et al., 2017). Paramedic education includes primary care and public health topics that might better address the contemporary needs of practicing paramedics (O'Meara et al., 2017). In developed countries, paramedic roles and scopes of practice are changing in response to aging populations and the attendant prevalence of chronic conditions, advances in technology, changes in community expectations, and broader

health system challenges (O'Meara et al., 2017). The emergence of paramedic practitioner roles in several countries illustrates the impact of social, technological, economic factors and how paramedics integrate into the health systems of their respective countries (O'Meara et al., 2017).

In the practice of modern emergency medicine, transitions of care have taken a prominent role, and during this time of health care reform, this model has become a focal point of improvement initiatives across the continuum of care (Kessler et al., 2016). A recent survey of interunit handoffs from ED physicians to hospitalists or other inpatient physicians in 10 U.S hospitals found that more than half of responding physicians reported that their ED did not use a standardized handoff (Kessler et al., 2016). The task force's characterization of transitions of care as it relates to the ED laid the foundation for future examinations of the model in the era of health care reform (Kessler et al., 2016). Pay-for-performance now extends much farther than its launch with the Centers for Medicare & Medicaid Services-based value-based purchasing program, which originally focused primarily on process measures and only touched 1% of Medicare revenue (Raso, 2015). The concept of revenue risk based on value has taken hold and is pervasive in other Centers for Medicare & Medicaid Services programs, state agendas, bundled payment plans, insurance and managed care payment strategies, and more (Raso, 2015).

The Affordable Care Act of 2010 propelled health care redesign in the United States. Federal lawmakers intertwined multiple approaches under two critical goals: reforming health insurance and reforming delivery and payment systems (Raso, 2015). Economics and ethics have an important role to play in terms of payment for health care

rendered, especially when payment comes through private insurance companies and public health service programs (O'Boyle & O'Boyle, 2016). Private insurers are profit-maximizing organizations and sometimes refuse to pay for the care of their policyholders (O'Boyle & O'Boyle, 2016). A doctor with an office practice has no obligation to admit into their practice a patient who is unable to pay or whose insurer or government program does not reimburse in a reasonable way (O'Boyle & O'Boyle, 2016). Pro bono work may cover some patients but not all. At the same time, the hospital is required to admit everyone, even those who cannot pay or whose insurance might not provide adequate reimbursement (O'Boyle & O'Boyle, 2016).

No-pay patients are a chronic problem for all payers. Unless a patient pays in cash or by credit card, payment for services rendered is not assumable (O'Boyle & O'Boyle, 2016). Third-party payers often reimburse providers at less than 50% of what they charge for services provided (O'Boyle & O'Boyle, 2016). In 2010, Tufts Medical Center, a 415-bed academic medical center in downtown Boston, created a full-time emergency management director role (Osgood et al., 2015). The purpose of the emergency management director role was to use the emergency preparedness standards and framework provided by the Joint Commission as a baseline to design and implement an extensive hospital incident command system throughout the hospital (Osgood et al., 2015). An important aspect of this position is the basis for developing best practices beyond the Joint Commission guidelines and fostering innovation through continual improvement of the hospital incident command system (Osgood et al., 2015). Over the last three years, Tufts Medical Center has implemented unique variations to its hospital

incident command system model to improve both the patient and operational and financial outcomes during an incident (Osgood et al., 2015).

Economics

The certificate of need legislation enhanced ED competition (Ni et al., 2017). A possible reason is that the law hinders predatory behavior, and therefore acts as an effective anti-trust tool (Ni et al., 2017). Researchers' findings indicate that competition is positively related to a state's population size and median income and negatively related to the prevalence of employer-provided insurance and the magnitude of illegal immigration in a state (Ni et al., 2017). The implementation of the electronic patient records in Italy demonstrates that different combinations of coordination mechanisms are possible in different regional contexts within one state (Laegreid et al., 2015). Coordination is influenced by the complex nature of the system as well as by the plurality of actors involved (Laegreid et al., 2015). The opposing interests of stakeholders, the division of labor at the different levels of government, and the active role played by private parties complicate coordination (Laegreid et al., 2015).

In terms of service provision models, governments have introduced varying delivery mechanisms for emergency medicine, which range from the direct provision by the government to privatized systems, where the full service or some of its components are contracted out to more or less autonomous service providers (Sarapuu & Lember, 2015). Although a medical service by nature, emergency medicine frequently delivers in cooperation with rescue administrations and its characterization as a public service lying on the borderline of health care and internal security (Sarapuu & Lember, 2015). The

increasing need for emergency medicine has been associated with changing societal structures, the transformation in the epidemiology of diseases and injuries, and societal expectations towards the service (Sarapuu & Lember, 2015).

The federal government provides special tax-exemption status, known as the community benefit standard, to some nonprofit hospitals. The exemption does not guarantee hospitals that these hospitals provide more or different services from those provided by hospitals that do not claim the community benefit status (Worthy & Anderson, 2016). However, on average, hospitals that claimed the community benefit spent 100 times more money on community services than hospitals that did not claim the community benefit (Johnston et al., 2016). Better estimates can help inform the appropriate nature and level of current health care and welfare services required by veterans, as well as what will be needed over the coming decades (Johnston et al., 2016). Johnston et al. (2016), for instance, used Vietnam-era national service conscription lotteries in Australia that took place between 1965 and 1972 to study the long-term health consequences for veterans. Emergency hospital visits provide an additional measure of health care utilization that can capture a wide range of health issues, including episodes of drug and alcohol abuse and accidents and injuries.

Operational Issues of Emergency Medicine

The lack of communication between clinicians, patients, and relatives is a major cause of patient complaints and errors. The number of presentations to EDs is increasing at levels above population growth rates, and these increases are becoming unsustainable (Adie et al., 2017). Medical student training largely focuses on individual clinician-

patient interactions (Macqueen et al., 2016). The study's findings and its implications, both for health decision-makers and researchers, demonstrate the benefits of engaging a range of stakeholders and industry partners and the importance of understanding population differences in relation to decisions to access emergency care alternatives and their preferences for how that care is delivered (Harris et al., 2018).

Education

Training of resident physicians is a critical component of developing efficiencies within the ED. Resident physicians provide most of the clinical care at academic teaching hospitals (Smalley et al., 2016). During their training, medical residents often rotate through various hospitals and medical services to maximize their education (Smalley et al., 2016). While each resident's personality is unique, knowledge of individual assessments by each resident empowers them to alter their behavior in ways that allow them to function as effective leaders (Randall et al., 2017). Depending on the size of the training program, manually constructing such a rotation schedule can be cumbersome and time-consuming (Smalley et al., 2016). The training should extend beyond clinical strategies to improve ED operational strategies.

Resident physicians' rotation assignment is a challenging task. Rotation assignments must balance the goals of maximizing resident experience and providing enough staff to provide excellent patient care while adhering to the rules governing resident education (Smalley et al., 2016). During their 5 years of training after graduation from medical school, through rotations, surgery residents have exposure to the different areas of medicine that they may face as practicing surgeons (Smalley et al., 2016). Given

the import's dedication to equipping and training officers in medical response and tactical operations, people are not better at improving survival (Bobko & Kamin, 2015). For success, ED planning should include tools that can be taught, practiced, and directly affect outcomes.

A group comprised of academic physicians and scientists lobbied to remove teaching in complementary and alternative medicine (CAM) from Australian universities (Brosnan, 2015). Seemingly inspired by an earlier UK-based campaign, the group approached vice-chancellors and the media, arguing that CAM degrees promoted pseudoscience and quackery (Brosnan, 2015). In the fast-paced environment of a pediatric ED, rapid clinical reasoning and medical decision-making skills are critical to high-quality patient care and safety (Harwayne-Gidansky et al., 2017).

Residency training programs foster the development and maturity of these skills through a combination of supervised patient encounters, clinical bedside teaching, didactic instructional methods, and occasionally simulation (Harwayne-Gidansky et al., 2017). Clinical algorithms can improve patient care and safety by standardizing medical decision-making to help reduce medical errors (Harwayne-Gidansky et al., 2017). One such algorithm was developed to identify children at very low risk for clinically important traumatic brain injury (TBI; Harwayne-Gidansky et al., 2017). Inpatient psychiatric care has been transformed over the past 30 years due largely to deinstitutionalization, managed care, and a community-centered approach to behavioral health care service delivery (Leon et al., 2016). Psychiatric hospitalization is no longer an extended treatment with episodes lasting weeks and even months or goals, which often

included structural improvement in patients' psychological and social functioning (Leon et al., 2016). As the inpatient care model shifted toward short-stay crisis stabilization, the empirical outcomes literature struggled to find a set of methods and statistical approaches that adequately evaluate the reconstructed psychiatric hospital system (Leon et al., 2016).

One approach to better understanding the acute-stay psychiatric hospital experience is quantifying, through repeated measurement, patients' treatment responses (Leon et al., 2016). Children are the most prevalent vulnerable population in U.S. society; they have unique needs during the response to and recovery from public health emergencies (Dziuban et al., 2017). The physiological, behavioral, developmental, social, and mental health differences of children require specific attention in preparedness efforts (Dziuban et al., 2017). Despite being more severely affected in disasters, children's needs are historically underrepresented in preparedness (Dziuban et al., 2017).

Health providers have addressed the disparity through better pediatric incorporation in preparedness planning from national to local levels (Dziuban et al., 2017). Entry to medicine is characterized by many people applying for a limited number of places (Stromme & Hansen, 2017). Acceptance is granted based on the applicants' high school academic results, but applicants can gain extra grade points by repeating exams, taking other university courses, or acquiring relevant experience (Stromme & Hansen, 2017). The rules concerning these options have varied over time. Less than 25% of candidates starting a degree in medicine between 1980 and 1999 entered directly from high school (Stromme & Hansen, 2017). Gaining admission into medical school is often

a long and risky process that demands patience and resources, including economic resources (Stromme & Hansen, 2017).

Risk Management

EDs must prepare for the unexpected. Emergency risk communication is significant for preparing for and responding to public health emergencies (Savoia et al., 2017). The effectiveness of emergency risk communication efforts depends upon the public health and other national and local systems in place and its capability to meet the needs of all population segments, especially the most vulnerable (Savoia et al., 2017). Evaluation science can improve the knowledge base of emergency risk communication by building evidence on which communication strategies, including messages and dissemination platforms, are or are not effective (Savoia et al., 2017). Despite growing literature in this field, a framework for the evaluation of emergency risk communication practice and its relationship to population outcomes during emergencies does not exist (Savoia et al., 2017).

Part of science leadership in the public health context is to find an appropriate balance between available data and information needs. Stakeholders must have a free flow of communication among the various public health partners (Iskander et al., 2017). Day-to-day incident management system decision-making, with the need of the broader public health and health care communities for generalizable knowledge, is conducive of original research (Iskander et al., 2017). One underappreciated role of the scientific enterprise in public health emergency response is to identify critical knowledge gaps and classify and prioritize research questions (Iskander et al., 2017). Activation of the EOC

provides a clear signal to the broader public health community of CDC's view of the urgency of a response (Iskander et al., 2017). Beyond providing a physical locus for response coordination and response coverage for clinical or public health inquiries, EOC activation allows the agency to mobilize personnel and, at times, financial resources to support emergency response functions (Iskander et al., 2017).

The pressure for increasing quality while reducing time and costs emphasizes managing risk in projects. Communication and knowledge creation are not easy tasks, especially when dealing with uncertainty; a comprehensive perspective on the goals, opportunities, and threats of a project must be a part of the communication (Cagliano et al., 2015). Cagliano et al. (2015) found that each risk management process requires specific tools of application. For example, some processes aim to evaluate multiple scenarios, depending on which risky events occur (Cagliano et al., 2015). Other techniques focus on investigating the origins and implications of risky events to establish chains of causes and consequences (Cagliano et al., 2015). They include cause and effect diagram or cause consequence analysis, event and causal factor charting, the five whys technique, event tree analysis (ETA), fault tree analysis (FTA), and human reliability assessment (Cagliano et al., 2015).

Traditional risk management techniques adopt a two-dimensional risk-ranking matrix (likelihood versus severity) to calculate a risk score for every project risk (Luppino et al., 2014). Domino effects are low-probability, high-consequence accidents causing severe damage to humans, process plants, and the environment (Khakzad et al., 2014). Because domino effects affect large areas and are difficult to control, preventive

safety measures have been given priority over mitigate measures (Khakzad et al., 2014). As a result, safety distances and safety inventories have been used as preventive safety measures to reduce the escalation probability of domino effects (Khakzad et al., 2014). However, these safety measures are usually a design considering static accident scenarios (Khakzad et al., 2014).

The resilience of organizations not only depends on the availability and accessibility of resources but also on the formal organizational structure (Van der Vegt et al., 2015). The very nature of emergencies requires that organizations are able to adopt decentralized decision-making structures rather than relying on hierarchy and centralization of authority (Van der Vegt et al., 2015). During crises, formal role descriptions are not sufficient; new procedures and new cooperation methods are required (Van der Vegt et al., 2015). Such adaptive responses require the ability to transform the formal structure and use decentralized, team-based, or network approaches to problem-solving (Van der Vegt et al., 2015).

Transition

Section 1 includes the foundation of the study, the background of the problem, a problem statement, a purpose state, the nature of the study, the research question, and the interview questions. I chose a conceptual framework, which includes the operational definitions, assumptions, limitations, and delimitations. The significance of the study referencing effective ED operational strategies consists of a contribution to business practice and a contribution to social change. The final analysis of Section 1 is a review of the professional and academic literature. The professional and academic literature review

describes CAS theory, alternative theories, the role of emergency medicine in U.S. health care, and operational issues of emergency medicine.

Section 2 consists of the project, purpose statement, role of the researcher, participants, and the research method and design. Population and sampling, ethical research, data collection instruments, data collection technique, and data analysis are a part of Section 2. Section 2 also includes discussion of the strategies I used to maintain reliability and validity in conjunction with the study.

Section 2: The Project

In Section 2, I review the importance of effective ED operational strategies for providing adequate care and safety for patients. In this section, I elaborate on the study purpose, the role of the researcher, and the participants. The Research Method and Design subsection include a justification for the methodology of a multiple-case study. I also describe the population and sampling of this qualitative case study, the ethical research procedures, data collection, data techniques, and data analysis. Reliability and validity are also discussed in the section.

Purpose Statement

The purpose of this multiple-case study was to explore effective ED operational strategies used by hospital leaders. The population for this study included 13 participants from four separate hospitals in a health care network in North Carolina who had developed successful ED operational strategies. Hospital leaders can potentially use this study's results to effect social change by implementing operational strategies in the ED to increase efficiency and availability of critical medical services to residents of local communities.

Role of the Researcher

The researcher chooses the research area, theoretical or conceptual framework, and research method and design (Khankeh et al., 2015). A researcher must select appropriate participants, collect and analyze data, and consider challenges and limitations (Khankeh et al., 2015). When conducting the analysis, the researcher's judgment and decisions directly impact the results (Moon, 2015; Olesen et al., 2018).

Researchers may consider how to prompt participants to reflect upon the topic of interest from an outsider perspective, generating broader discussion around the topic (Berger, 2015). Researchers must consider how culture and background may shape research participants' expectations (Thorpe et al., 2018). The researcher gives articulation and conceptual structures to organizational members partially formed theoretical insights (Islam, 2015). As a team member of the ED with over 20 years of service, I have observed the impact of ED operational strategies. However, I strove to not allow preconceived ideas to affect the study. The recommendation for researchers is to be mindful of the potential for cultural norms around the topic of interest to reinforce these meanings and thereby limit the potential for challenges in the research process (Thorpe et al., 2018).

In conducting the study, I heeded the guidelines set forth in the *Belmont Report*. The *Belmont Report* includes specific principles related to (a) boundaries between biomedical and behavioral research and the accepted and routine practice of medicine, (b) the role of assessment of risk-benefit criteria in the determination of the appropriateness of research involving human subjects, (c) appropriate guidelines for the selection of human subjects for participation in such research, and (d) the nature and definition of informed consent in various research settings (U.S. Department of Health and Human Services, 1979). Additionally, the *Belmont Report* guidance encompasses the ethical principles of respect for persons, beneficence, and justice. Respect for persons incorporates at least two ethical convictions towards treatment as autonomous agents, and persons with diminished autonomy are entitled to protection. The term *beneficence*

encompasses acts of kindness or charity that go beyond strict obligation. Justice occurs when the researcher treats participants as equals. Heeding the guidelines of the *Belmont Report* can help researchers to resolve issues concerning participants in clinical trials and research studies (U.S. Department of Health and Human Services, 1979). I took these measures to avoid potential risks that might have caused harm to the participants or study organization and to focus on the participants' well-being throughout the study.

Researcher bias can occur at any phase of the project, including the design, analysis, and reporting. Biased research findings lead to distortions in interpretation (Shepperd, 2015). Qualitative researchers often employ a bracketing technique to reduce research bias (Sorsa et al., 2015). Bracketing involves researchers reserving their understanding and operating non-judgmentally (Sorsa et al., 2015). Bracketing may allow the researcher to mitigate the potentially harmful effects of unacknowledged preconceptions to increase study rigor.

Bias may emerge in the fieldwork through the researcher's social characteristics and experiences, self-disclosure, and avoidance of individuals who are challenging (Hoolachan, 2016). The researcher's preconceived ideas may introduce biased evidence, which can have harmful implications for evidence-based practice, theory development, and perceptions of rigor (Banks et al., 2016). Shamseer et al. (2015) found that when reviewers selectively choose which information to include in a report based on the direction and significance of findings, they risk biasing the evidence base of health care decisions and policies. I sought to mitigate bias by keeping detailed notes and electronic

recordings to avoid misinterpretations, misquotes, and/or conflicting judgments of research findings.

Researchers conduct interviews to obtain important information in various contexts, including operational audits, compliance testing, and IT audits (Lee et al., 2019). Before implementing the investigation, the researcher should instigate a protocol in which they identify and correct any inconsistencies and misunderstandings (Echeverri & Chen, 2016). An interview protocol outlines the interview process, with critical exploration points, provisional questions, and planned probes and transitions (Arsel, 2017). An interview protocol helps a researcher to consistently elicit relevant from each participant (Köhler, 2016). I used an interview protocol (see Appendix A) in conducting interviews. An interview protocol delineates those conditions that show what it means to protect human dignity in the field of medical research (Scherzinger & Bobbert, 2017).

Participants

Participants in a study must be knowledgeable and credible about the research question when participating in a study. The specificity of searches for potentially eligible participants can probably improve by adding search criteria (Godin et al., 2015).

Researchers must be mindful of the multiple views through the phenomena, so participants with different perspectives are used (Katigbak et al., 2016). Interviews are conducted to obtain important information in various contexts, including operational audits, compliance testing, and IT audits (Lee et al., 2019).

The focus of this doctoral study was on how hospital leaders implement effective operational strategies in the ED. The study's eligibility criteria included senior leaders in

a hospital setting who directly responded to the ED and had experience with implementing effective operational strategies. Gatekeepers play a fundamental role in contexts characterized by a specific and localized knowledge base because of their ability to access, convey, and trans-code external knowledge and to make it accessible and meaningful to local actors (Breschi & Lenzi, 2015). The gatekeeper signed a letter of cooperation (see Appendix B). After receiving a signed letter of cooperation and gaining Walden University Institutional Review Board approval (no. 01-11-22-0322593), I worked with the gatekeeper to identify appropriate participants.

Upon finalizing a list of 13 participants, I emailed each an introductory letter (see Appendix C) inviting their participation in the research study. To indicate their agreement to participate in the research study, they signed a consent form. I scheduled interviews at participants' convenience. The interviews were administered through the videoconferencing platform Zoom. A researcher who conducts face-to-face interviews is able to capture more attributes and obtain a higher response rate (Hogan et al., 2016). However, I was unable to schedule face-to-face interviews due to COVID-19.

One of the strategies I used to establish a working relationship with the participants was to read the informed consent. The informed consent form provided participants with a description of my doctoral study, which included policies, procedures, confidentiality and privacy measures. Case study research provides practical and technical discussions on each of the six elements of case study research: the plan, design, preparation, data collection, analysis, and reporting (Yin, 2018). The protocol encompasses preparing for interviews, interacting with gatekeepers of vulnerable groups,

planning for interview timing and location, building relationships and conducting therapeutic interactions, protecting ethically vulnerable participants, and planning for disengagement (Dempsey et al., 2016). Researchers in various disciplines pursue creative ways to explore complex areas of inquiry (Conceicao et al., 2017).

For each individual who agreed to participate, I asked them to sign the informed consent in person or electronically by email. Participants replied to the emailed informed consent with the words “I consent.” Before each interview, I addressed any questions or concerns and shared the benefits of the research. Participants had access to my contact information for questions arising before and during the interviews.

Research Method and Design

Research Method

No one can be the master of all research methods; thus, researchers tend to practice a small subset of available research methods, although all could add value (Nunamaker et al., 2017). Therefore, I chose a qualitative method to explore effective ED operational strategies. When adopting qualitative methods, scholars draw on the observations from the data to introduce abstracted knowledge that can generalize beyond the specific contexts (Bansal et al., 2018). Researchers focus on qualitative methods to explore a phenomenon, and there is no intent to test a theory (Park & Park, 2016).

Quantitative researchers manipulate and transform numeric data to examine a research question (Bansal et al., 2018). Researchers associate quantitative with statistical analysis of the relationship among data (Tominc et al., 2018). I did not use numeric data to explore my research question. Thus, I rejected a quantitative method.

Mixed methods research is a process of research where the researcher integrates quantitative and qualitative methods of data collection and analysis to understand a research purpose (Creswell & Clark, 2018; Salmon, 2016). A study of examples of published research reveals that there are other possibilities for ways that the qualitative and quantitative strands of a mixed method study integrate to extend the explanatory power of a theoretical model (Creamer, 2018). Numeric data collection was not a part of this doctoral study; therefore, a mixed-methods approach was not appropriate.

Research Design

Research designs can provide distinct contributions that are identifiable beyond their traditionally claimed exploratory character (Ridder, 2017). A case study research design demonstrates that case study research incorporates different scientific goals, collections, and data analyses (Ridder, 2017). Rigor in case studies comes from the research design and its components, which Yin (2018) outlines as (a) the study's questions, (b) the study's propositions, (c) the unit of analysis, (d) the logic linking the data to propositions, and (e) the criteria for interpreting the findings. The researcher can engage in an iterative problem-solving process to learn about the problem space and the solution space (Nunamaker et al., 2017). A design emphasizes an iterative, visual, and multidisciplinary process using contextual observation, scenario building, and rapid prototyping to explore a problem (Rai, 2017). The research designs that appeared in top journals were not immune to criticism due to deep qualitative reviews assessing only a small fraction of research designs have identified methodological limitations in those works in issues such as moderators and mediation (Aguinis et al., 2016).

Phenomenology involves specific methodologies and steps to uncover the depth of human experience (CohenMiller, 2018). While all current forms of phenomenology remain centric to the lived experience of the individual, phenomenology has evolved into many subtypes, which include interpretive phenomenology (interpreting meaning from how an individual experienced a phenomenon), existential phenomenology (how an individual forms the constructs of their group reality), and hermeneutic phenomenology (exploring the texts of lived experience) (McGaha & D’Urso, 2019). Each phenomenological approach may share specific characteristics with another; there is perhaps more nuanced than a concise distinction between these approaches (Abalos et al., 2016).

Ethnographers have usually coupled participant observation—the method they are most famous for having developed—with additional ones such as interviews (formal, semistructured, and informal), sifting through written archives, gathering life stories and oral narratives that could be of many genres, and collecting audiovisual records and written documentation (Seligmann & Estes, 2020). Ethnographic research methodologies of lived experiences, observed practices, cultural/social behavior, day-to-day activities, and daily events ([Keränen](#) & [Prior](#), 2019). The aim of ethnography is not the correct representation of objectively true events or facts but an adequate reconstruction of the members’ point-of-view and knowledge (Woermann, 2018).

The concept underlying data saturation as a guide to sample size is that once saturation is at its reach, the results must be capable of some degree of generalization (Boddy, 2016). Based on traditional qualitative research, studies are purposeful of

selection and the coding of articles continuous until data saturation is reachable (Shams et al., 2016). The qualitative research standard for qualitative research is data saturation due to relying on the number of participants (Hancock et al., 2016). Upon the completion of data collection, I did not add any additional data. The final number of interviews consisted of 13 participants. I continued collecting data until the point of data saturation.

Population and Sampling

In case studies, using a qualitative method is to examine effective ED operational strategies. The population and sampling for these case studies consisted of hospital leaders directly in association with the ED. The character of the research problem, the context in which it is investigated, the purpose of the research, the nature of the research questions, the characteristics of who or what is studied and, particularly, the creativity of a researcher in handling this process, are critical factors that can have a bearing on required sample size (Blaikie, 2018).

This highlights the competing priorities that are at play when making sampling decisions in qualitative research, such as the need to satisfy practical requirements of indicating sample size in advance, whilst at the same time seeking to adopt a sampling approach that is in keeping with the methodological considerations pertinent to the particular study. The competing priorities that are at play when making sampling decisions in qualitative research are the need to satisfy practical requirements of indicating sample size in advance, whilst at the same time seeking to adopt a sampling approach that is in keeping with the methodological considerations pertinent to the study (Sim et al., 2018). The population for this study included 13 participants from four

separate hospitals in a health care network in North Carolina who have developed successful ED operational strategies.

Ethical Research

The informed consent process is key to assuring voluntary participation in research and engaging research participants (Grady et al., 2017). The participants must align with the overall research question: Physician leader candidates share responsibility with senior leaders because of their natural potential for the intended role and preparation in areas where technical knowledge or new leadership skills are required (Henson, 2016). Informed consent generally requires that subjects have sufficient information about the research, comprehend the information, and agree to participate (Grimmelmann, 2015). The informed consent form provided participants with a summary of the study, potential risks, discomforts, and the beneficial outcomes of the research. I provided each participant with my contact information for any questions or concerns arising before engaging in the study. Each participant signed the consent in person or electronically or by email. All participants agreed to participate in the study, and replied to the email with the phrase, *I consent*.

Research ethics should take into account potential disparities of cognitive ability and power between researchers and research participants (Mietola et al., 2017). Part of the informed consent includes the participant's right to withdraw from the research study at any time. There is no retaliation with the participant for making this decision. Participants knew prior to accepting participation in the interview that it is sole of his or her free will and no form of payment or royalties.

The researchers typically record the data on recorders stored at home and occasionally use additional security, such as passwords to files containing the material on a hard drive. Ensuring confidentiality is a compromise between the ability to route publications and the risk of leaking information (Surmiak, 2018). While research ethics committees insist on researchers' maintaining confidentiality, police agencies and companies know the existence of consent forms and therefore often want researchers to surrender their confidential findings (van den Hoonaard, 2018). As the researcher, I am storing data securely for 5 years to protect the confidentiality of participants by protecting human research participants. Permanently, disposing of information after a 5-year period incorporates the policies and procedures of Walden University's Institutional Review Board protocol.

Data Collection Instruments

I was the primary data collection instrument for the multiple-case study. The data collection instruments are a core component of data collection (Chen et al., 2019). Qualitative researchers gain access to the participants' natural environment and are the primary research instrument to collect and analyze data (Chen et al., 2019). Researchers may incorporate technological advances for data collection to reduce respondent burden and administration costs and improve data quality (Chatzitheochari et al., 2018).

Researchers use a case study to explore a time and space-bounded phenomenon (Alpi & Evans, 2019). Data collection methods for qualitative research most frequently used are in-depth interviews, semistructured interviews, focus groups, journals, and participant observation (Mignone et al., 2019). Semistructured interviews were the

primary source of data for this study. Also, I collected additional data from a review of internal documents and casual observations. In the case study design, various methodological approaches may be employed to explore the complexity of the problem being studied (Creswell, 2018). Direct casual observations can serve as a valuable additional source of evidence (Alpi & Evans, 2019).

Reflecting on and actively engaging with researcher field personas may be an essential data collection tool in its own right (Damsa & Ugelvik, 2017). I did not coerce any participant before or after the interview. I remained unbiased in order not to influence any participant's responses. Although researcher bias cannot be eliminated, researchers can manage their internal biases (Teusner, 2016). As a tool to increase the standardization of interviews and increase my objective stance, I used an interview protocol. An interview protocol includes five phases, including (a) identifying the prerequisites for using semistructured interviews; (b) retrieving and using previous knowledge; (c) formulating the preliminary semistructured interview guide; (d) pilot testing the guide; and (e) presenting the complete semistructured interview protocol (Kallio et al., 2016).

An interview protocol contributes to objectivity and trustworthiness (Kallio et al., 2016). I used an interview protocol (see Appendix A) to standardize the interview process. To enhance the study results' reliability and validity, I performed a member check by asking each participant to review and confirm a summary of my conclusions of the interview. Member checking, also known as participant or respondent validation, is a technique for validating results' credibility (Birt et al., 2016). Naidu and Prose (2018) recommended reforming reviewing member checking, returning results, and

dissemination as accountability practices rather than as validity practices. Upon completing each interview, I summarized each participants' comments and returned my summary to each participant for verification to ensure that my interpretation of the interview is correct.

Data Collection Technique

The case boundary and unit of analysis are components of conducting a case study (Abeysekera, 2019). Therefore, my data collection technique uses the information for my research question of what operational strategies hospital leaders use. Data for this study came from participant interviews, casual observations, and internal documents.

Face-to-face interviews, direct observation, and document review are qualitative data collection techniques (Marshall & Rossman, 2016). My data collection technique consisted of collecting data by interviewing through Zoom and issuing an online or paper survey due to the current coronavirus pandemic. I used a Zoom recording to record all participants' responses. To standardize each interview, I followed an interview protocol (see Appendix A). After each interview, I used member checking. Each participant had the opportunity to review my interpretation of the interview. Qualitative research data collection methods vary depending on the research requirements (Mignone et al., 2019). I maintained a written journal of my research notes, compile copies of the internal documents.

Data collection techniques include in-depth interviews, observations, and documents (Sabaruddin & Said, 2020). Data collection involved open-ended questions to eliminate collecting unnecessary information that does pertain to the subject matter. The

interviews were all conducted through Zoom. Each interview lasted approximately 30 minutes. I used Zoom recording and transcript to document comments. After the interview, participants had an opportunity to clarify and substantiate information through the member checking process.

There are advantages and disadvantages to qualitative collection strategies. The advantage of data collection is the opportunity to speak with the participant who knows the data I am collecting. Advantages can be interviewing participants who can identify lived experiences concerning understanding the meaning of the study's phenomena. A disadvantage is scheduling a time and place to speak with the participant, leading to a physical toll on collecting data. Another disadvantage is identifying the proper participant with reliable information to benefit my doctoral study on effective operational strategies in the ED. Due to the coronavirus that is currently in effect, I decided against conducting face-to-face interviews.

The data collection process should be well structured, transparent, and easily understood by readers (Queiros et al., 2017). Qualitative researchers rely on spoken data collected through the interview process (Arsel, 2017). Researchers interact with the participants directly, such as data collection through interviews (Rahman, (2017). Therefore, I used open-ended questions to gather information about effective ED operational strategies.

Data Organization Technique

Entering and consistently organizing data from the start prevents researchers from spending time harmonizing the data later (Broman & Woo, 2018). Treat data gathering

like any other business decision; if the cost to extract data exceeds the benefits, the researcher should seek alternative data sources (Hume & West, 2020). I organized each participant's response by placing each question in individual groups. I transcribed all information from participants on a held hand recording device and using Zoom transcript device as a backup. I allowed each participant to verify my initial summary for the accuracy of my interpretation.

To effectively analyze qualitative data, one must use a systematic process to organize and highlight meaning (Vaughn & Turner, 2016). Participant identifying information remained confidential. To maintain confidentiality of participants I used an alphabetic letter to distinguish each one. Recordings and transcripts of each interview are stored in individual folders. Materials from all data collection are in a secure location while maintaining information for 6 years.

Data Analysis

As in any research design, if its data collection and organization methods lack rigor, analysis can be impeded, which minimizes the value of the research outcomes (Williams & Moser, 2019). Some researchers struggle with uncertainties arising during data analysis (O'Neil, 2019). Computer software applications to aid qualitative data analysis increase the objectivity of the data analysis (Niedbalski & Ślęzak, 2016).

Through methodological triangulation, researchers collect data using different methods, including interviews, observations, and document reviews (Fischer & Van de Boyenkamp, 2019). I used triangulation data in my case studies to develop a comprehensive understanding of phenomena. The triangulation data allowed me to bring

together different data sources, including interviews, internal and external documents, and observations.

Qualitative data analysis can provide an accurate explanation of phenomena (Zainal et al., 2020). Interviews are a widely used collection technique because they are flexible, allowing in-depth analysis from a relatively small sample (Young et al., 2018). Yin (2018) describes the 5-step process of data analysis as (a) compiling, (b) disassembling, (c) reassembling and arraying, (d) interpreting, and (e) concluding.

Internet-mediated communication programs such as Skype or Zoom can facilitate data collection (Quartiroli et al., 2017). I used Zoom during my qualitative research process, based on each participant's convenience. Researchers frame qualitative studies by a conceptual framework, suggesting deductive or inductive processes (Mihas, 2019). The delineation of alternative forms of qualitative data analysis is due to qualitative researchers' need to have some credibility associated with their analytic approach (Kaya et al., 2018).

For semistructured or unstructured interviews, the analysis of interviews often involves a process known as coding (Young et al., 2018). I used alphanumeric as a coding device for each participant. Triangulation is recommended as good practice in conducting case study research and increases validity through a convergence of findings, sources, or methods (Farquhar et al., 2020). Techniques, strategies, and procedures have been developed to help qualitative researchers extract meaning for their data, including software, and interpret it in ways that enhance our understanding of complex phenomena (Ganapathy, 2016).

Qualitative analysis software tools, such as NVivo, Atlas.ti, and Debose, provide a way of labeling or coding the data (Pearce, 2019). NVivo helped me to analyze my data visualization tools. I uploaded NVivo to organize my data collection and created a coding system for each participant. I used NVivo to store reference materials, participant recordings and organize other analyses in conjunction with my semistructured interviews. A key NVivo strength is its ability to allow researchers to assign meaning to data during the coding stage rather than after lexical analysis (Wilk et al., 2019).

Qualitative data analysis is done by collecting data obtained from various sources supported by research instruments and then proceeding with data processing then described descriptively based on the problem formulation and data obtained in the field through interviews (Rustantono et al., 2020). Data collection techniques used a thick description. Data analysis used an interactive model with four grooves: data collection, data reduction, data presentation, and conclusion, continuously until saturated (Suryadi & Ahmad, 2020). I reassembled data by using a thematic development strategy. The primary goal of thematic analysis is to accurately reflect the phenomenon with rich data (Hastings & Pennington, 2019). I interpreted each participant's response and allowed each participant to verify information through member checking before concluding the emergent themes.

Reliability and Validity

Reliability

Ensuring reliability is a central tenet of ensuring quality research (Jordan, 2018). The dependability of research findings is a measure of reliability consistency (Hays et al.,

2016). My reliability came from the dependability of the data collection. I used member checking to increase the dependability of my research. After the finalization of each interview, I asked participants to verify my interpretation of the information received.

The interpretation of data requires qualitative researchers to assess direct and indirect evidence to support the data interpretation's reliability (Maroun, 2018). Birt et al. (2016) recommended that member checking is necessary to assure the researchers' interpretation of interview data. Upon completing the interview, I summarized each participants' comments and returned my summary to each participant for verification to ensure that my interpretation of the interview is correct. This imperative compels researchers, at the outset, to intentionally include member checking, returning results, and dissemination phases as a part of the research cycle instead of viewing them as optional addendums (Naidu & Prose, 2018).

Validity

Researcher reflexivity is a strategy for ensuring trustworthiness (Hays et al., 2016). To increase the validity of the study findings, I focused on credibility, transferability, confirmability, and data saturation. I used various strategies in my case study to increase validity in data collection and thematic development.

Creditability

Trustworthiness is a proxy for establishing the credibility of research outcomes and the truthfulness of findings (Cypress, 2017). Credibility is achievable through a careful description of the data analysis and verification of sources of data that is obtainable from the collection of the participants. Maintaining credibility requires

researchers to anchor the unit of data analysis in the central phenomenon being investigated (Daniel, 2018). In order to improve credibility in qualitative research, by means of the triangulation strategy presented in a framework, the researcher allows the reader to have a better understanding of the proposals in this work (Abdalla et al., 2018). Accountability practices may serve to increase trust and cooperation through consistent member checking, returning results at discussed intervals and formats, as well as early negotiation of how returning results and dissemination will ultimately unfold. (Naidu & Prose, 2018). To establish credibility, I followed up with participants by doing member checking to link my collected data to my findings.

Transferability

Forero et al. (2018) reported that to demonstrate transferability, the researcher ensures that the recruitment and selection of a sample are based on expert knowledge of participants, and participants are knowledgeable about the phenomenon under study. Qualitative researchers use thick descriptions of real-life settings and understandings of participants' worldviews not only to achieve transferability but to help bridge the gap between practitioners and researchers (Ospina et al., 2018). Transferability does not advocate generalizability (Lincoln et al., 2017; Smith, 2018; Smith & McGannon, 2017). Instead, transferability allows findings gained in a particular context to offer valuable lessons to other similar settings. The ED operational strategies identified in this study may not be transferable to other contexts due to various facilities' use of different methods conducive to their environment. However, I provided thick substantive

descriptions that will allow other researchers to gain insights from my research that can be transferable to other settings.

Confirmability

Confirmability is the degree to which other researchers can confirm the findings of a research study. Confirmability is concerned with establishing that the findings' data and interpretations are not figments of the inquirer's imagination but derived from the data. Replication of research findings increases the trustworthiness of a study (Pratt et al., 2020). Triangulation for this research includes comparing and cross-checking with multiple data sources within and across different qualitative methods for consistency of information derived at different times and by different means (Patton, 2015). Using an audit trail ensures dependability and confirmability of study results (Korstjens & Moser, 2018). I sought to increase the study's confirmability by focusing on data collection, data analysis, and interpretation.

Data Saturation

To increase the validity of study results, researchers attain a point of data saturation. Data saturation is the point in the interview process where additional data collection results in no new insights (Yi et al., 2019). The researcher's experience and expertise in both interviewing and their subject area are critical components in optimizing the sample size required to reach saturation (Roulston, 2016). Nelson (2016) identified the problematic issue of achieving saturation. I collected data until I reached a saturation point where additional data collection would further understand themes.

Transition and Summary

Section 2 includes the purpose of this multiple-case study, which was to explore operational strategies used by hospital leaders in the ED. In this section, I described my position as a researcher and the process of approaching the participants. I included my purpose statement along with a research question. Section 2 also included the processes of data collection and how I distinguished reliability and validity.

Section 3 contains an in-depth scholarly presentation of findings from my research. This section includes an application to professional practice to aid in suggestions to ED operational strategies. Section 3 provides implications for social change and recommendations for action and further research. I summarized my research experience and conclude with a detailed message to the reader upon completing the study.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this multiple-case study was to explore effective ED operational strategies used by hospital leaders. I collected data from organizational documents and interviews with leaders in health care to explore ED operational strategies. My data collection came from interviews with 13 participants at four separate hospitals in a health care network in North Carolina. The interviews were semistructured with open-ended questions. Each participant engaged in member checking for confirmation of their interview responses and allowed me to make changes to ensure the accuracy of their statements. Using Yin's (2018) five step process of data extraction, I identified four emergent themes. The themes related to ED operational strategies included (a) triage operational strategies; (b) wait time protocol; (c) use of technology; and (d) communication among physicians, staff, and patients.

Presentation of the Findings

The overarching research question was, what effective ED operational strategies do hospital leaders use?

Triage Operational Strategies

The primary triage functions to screen out critical ill patients to the critical and semicritical zone, thus improving the physician encounter time (Peng et al., 2021). Patients who arrive in the ED will be registered promptly and then they were triaged according to department triage protocol. When the ED serves different categories of patients, the primary duty of the ED staff is to address the most urgent cases (Chen et al.,

2020). Staff should give the highest priority to critical patients and allocate all the necessary medical resources to them as soon as possible because every minute counts for the survival of critical patients (Chen et al., 2020).

Triage is the front office of EDs. In triaging patients, health care providers seek to make a quick assessment of a patient's urgency to receive a health treatment (Cannavacciuolo et al., 2021). P1 stated: "Every nurse in the emergency department must be trained for triage, emergency severity index (ESI) which evaluates the acuity level of each patient by identifying the level of illness." P10 agreed with P1 by stating,

You need an experienced nurse in the emergency department to be your triage so that they can recognize different signs or different things that could increase that patient's acuity or bump them to a different level. but it is standard using ESI.

P10 added the following:

Triaging is based on the emergency severity and that and different facilities have different methods, but we use the five ESI process. One is your most acute at risk of passing away, five is your least acute, so they probably could have waited to go to their regular doctor the next day.

All participants agreed that the care of patients is based on their ESI. The ESI also has an electronic board that monitors each patient's acuity level. P2 described the ESI levels:

There are five levels for the ESI. Level 1 ESI is someone with a life-threatening illness such as a code stroke or a cardiac arrest. Level 2 ESI may be a patient with chest pain or shortness of breath. Level 3 could be abdominal pain or urinary

symptoms. A Level 4 is an example of a dental ache, or a sprained ankle and Level 5 is an example of a prescription refill.

Scholars have sought to identify ways to make triage more efficient to streamline the processing of patients and reduce the waiting time of more urgent patients (Cannavacciuolo et al., 2021). P3 reported triaging patients based on their vital signs and history. P3 stated, “Evaluating the acuity levels, while receiving information from the nurse, offers me the mobility to downgrade as well as upgrade.” P4 was in agreement with P3 and stated that they based triage on who has a more life-threatening complaint versus the time of arrival. P9 stated,

Each patient that enters triage receives a triage education, assessment of acuity level, and what to encounter. Assessments are based on the highest to the lowest ESI level. The admit holds warrants many patients that have undifferentiated clinical presentations in the waiting room. Re-triaging is frequent, a constant review of the track board, and reviewing test results enables to detect any change in patients as well as conveying the update to the patient face-to-face.

The specific strategies used by ED leaders depend on multiple variables, including the physical layout of the ED. P12 stated, “The facility allows patients to enter from the front or back entrance and receive registration for triage. After a nurse triages the patient, the patient is seen by a nurse who initiates orders and provides necessary treatment.” Using triage notes is insufficient; details may be overlooked if the underlying interactions are ignored (Li et al., 2021). The factors that affect the overall improvement of ED performance include the permanent presence of emergencies, the management

method in the department, patient triage and counseling methods, the provision of necessary facilities and physical spaces, training classes for staff members, the availability of diagnostic facilities, and the motivation of personnel (Jafari et al., 2020).

Knowledge together with experience inform health care professionals' care of patients. P6 stated,

You can sometimes tell whether a patient is sick by the way the patient walks into the door, so there is a visual affect. With this last surge of COVID, [we] have the misfortune of being at capacity at the hospital.

Similarly, P7 stated,

It is best to have a first medical contact such as a CNA or a paramedic that sits up front so when a patient walks through the door, he or she will receive a quick on the site assessment. We triage based on like acuity, but if everybody's acuity is about the same, it's more of a time sensitive issue.

P8 concurred with P7:

It is facility registers the patient out front just as other facilities and then the patient goes to the triage room. The triage room offers an assessment of the patient containing a questionnaire, vital signs, and so forth. Once acuity level is assigned, based on the patient's criteria, to minimize any delay, especially when we are at peak capacity.

P11 added that a triage operational strategy is necessary:

Their facility accommodates patients in the pediatric emergency department. This facility does not have the volume of patients as an adult emergency department.

Therefore, patients are triaged by a nurse and are not always guaranteed a room upon arrival to the ED. This could be due to overcrowding, very high acuity levels, and no bed availability. COVID-19 had a huge impact on all facilities' patient overcrowding in the ED. Even though patients are triaged, it still makes for a long wait to see the physicians.

On some occasions, facilities have the duplicate process by having a tech, paramedic, or nurse at the front desk versus have one specific person to triage the patient. One additional method is having a small basket at the desk with stickers inside. The stickers are an indication that bloodwork along with vital signs are complete and patient is ready for triaging. They also have tele-triage which the triage nurse enters the chief complaint remotely and determines the next point of care. In addition to a nurse, the tele-triage can also consist of a consultation with a practitioner or physician assistant. Tele triage allows a physician to speak with the patient virtually, place any appropriate orders for the patient, and either discharge or admit patient. Implementing this function can expedite the process while a room is made available.

A fast track may be created as a separate stream from the ED main waiting queue, with designated doctors treating the less acute patients. I can reduce the waiting time before treatment for all ED patients and thus mitigate ED crowding (Li et al., 2021). Semi-urgent patients arrive at an ED and visit the physician after triage (Wen et al., 2020).

Wait-Time Protocol

Wait time for patients is a key indicator of in-patient satisfaction. The wait time is measured in minutes under the assumption of continuous service time (Wen et al., 2020). Long waiting times and delays in an ED are undesirable, as they result in unnecessary pain for patients and delayed care (Liu & Xie, 2021). Overcrowding, long wait times, and delays frequently occur in hospital U.S. EDs (Liu & Xie, 2021).

The main causes of wait-time issues are the stochastic and time-varying demands of patient arrivals at an ED and the temporary overloading of EDs (Liu & Xie, 2021). Immediately after triage, patients should be served within a maximum allowable waiting time, whereas in-process patients need to be served as soon as possible to avoid adverse events (Wen et al., 2020). A typical daily patient arrival pattern is described as follows: the arrival rate is low at night, experiences a sudden increase beginning at approximately 06:00, remains high during the day, and displays another peak at approximately 21:00 (Liu & Xie, 2021). Although the hospital is aware of the variability in the patient arrival rate throughout the day, the ED continues to utilize simple fixed staffing and scheduling: physician shifts have a fixed 8-hour duration, and the days are split into three shifts: the AM shift (7:00–15:00), the PM shift (15:00–23:00), and the overnight shift (23:00–7:00 next day).

When individuals arrive at an ED, they are typically diagnosed and then either treated, transferred, admitted, or discharged (Lines, 2021). Measures for describing time spent during ED visits may refer to visit lengths or lengths of stay (LOS), which is the total time spent in the ED before receiving medical care (Lines, 2021). These concepts

are similar, though wait time is a subset of total LOS. Once triaged and seen by the initial provider team in the ED, overall, LOS may be determined by factors outside of the ED's control, such as the availability of specialists, imaging equipment, or beds at another unit or facility (Lines, 2021)

One of the most important endpoints followed in the ED operations is the amount of time from patient presentation to initial evaluation by a physician (George et al., 2020). This time interval, denoted time-to-physician, is important because of its intuitive relationship to ED efficiency as well as patient satisfaction (George et al., 2020). Because patients may arrive in the ED and then wait for registration, wait time calculations using the registration time as a starting point could be biased (George et al., 2020).

Most ED administrators in the study indicated that they had implemented electronic devices to monitor wait for staff to monitor the length of stay of patients. P1 stated, "Using the electronic medical records as tool enables us to run daily reports to track wait-time acuity." P2 stated, "They use dimensions and Epic, which are reports that inform managers of how long patients are waiting, what is the average wait time, wait time in the waiting room, and the total time of the patient's complete visit." P3 stated, "Arrangement of the facility's tracking board in the waiting room is based on acuity levels of the patients and not time."

P4 stated, "Using timers and dimensions helps track the wait times and arranges the longest wait up top. When logging into the system, wait time can be immediately determined and patients will not what to expect." P5 stated, "The facility uses dimensions

and get reports daily with a dashboard in dimensions that the managers can see throughout the day.” P6 stated,

It checks Epic tracking because once the patient signs in, the clock starts ticking. The minute a physician assigns himself or herself to the patient, wait time continues and everyone has a primary understanding of how we can keep track of all those times because every minute is accounted for through EMR [electronic medical record]; therefore no one can hide.

P7 stated, “The ED follows suit through Epic when patient arrives and gets registered.”

P8 stated,

Wait time is based on dimensions in which that process can run in the background. These times are done by a whole separate data team in which wait-time numbers are given. Dimensions cannot be manipulated because once the patient checks in, the clock starts running and the numbers are followed.

P9 followed up with the comment:

Color coding wait times allow to monitor when patients are approaching a two-hour or a three-hour wait time because it changes automatically and then grays out. If you have awareness of what red represents, then you will act on it.

P9 continued,

The real time of our patients, from an administrative point of view, is outlined in a monthly report to each hospital. The tracking consists of door to doctor, doctor disposition, and then total time in the ED. The tracking is reviewed in our

monthly medical staff meetings with the Mid-Atlantic Emergency Medical Associates MEMA so that everybody is aware.

P10 stated, “I receive all data from EMR which is a part of Epic.” P11 stated, “using Epic is an easy process to monitor patient wait time, physician encounter, and moved to a bed.” P12 stated, “Utilizing the track board for collecting information is a useful patient resource.” P13 stated, “Their ED collaborates with the other participants tracking patients’ wait time. One of the best features is that Epic tracks wait time step-by-step from the beginning to the end.”

The theme of wait time protocol aligns with the conceptual framework of CAS. Researchers use CAS to identify and frame a collection of diverse interconnecting parts (Kitson et al., 2018). Burrows (2020) determined that CAS allows researchers to understand an awareness of emerging patterns. The emerging patterns in an ED are the variables embedded in developing a wait time protocol.

Use of Technology

Technology is the most desirable and efficient way in triaging patients, wait times, and communication. Over the last decade, the health care sector has accelerated its digitization and use of electronic health records; the notion of intelligent health has also increased in popularity (Vyas et al., 2022). P1 stated: “Relies on the advantage of technology by tracking EMR.” P2 stated: “Considers the new process in our technology identifies patients in the field that may not need come into the ED. Telehealth is also a technology where patients can speak with the physician over the phone or video chat.” P3

stated: “The ED depends on the tracking board to obtain data and identify the acuity levels of my patients.” P4 stated:

Using the technology function of dimensions is a huge tool because Epic can be a chat function to start a large group for communication. This function can encounter the charge nurse, the physician, the pivot nurse, the triage nurse, and all involved in a conversation or the primary nurse. The chat allows you to communicate about the same patient and tag in patient information without a HIPAA violation. and secure the patient’s information to protect HIPAA violation. The use of vault phones in the ED is significant in reaching out to other counterparts such as environmental services (EVS), dietary, radiology, and so forth. The vault phones contain secure lines which is essential health care and operational functions in the ED.

P5 stated:

The ED finds that the EMR assists patients with a device called MyChart. MyChart allows patients to review his or her medical information such as appointments, past and present, physician messages, test results, prescriptions, and to send messages. A bonus feature that MyChart offers is a link to scheduling a physician visit in the privacy of your home.

IT is part of the new services developed within the health care industry, as there is evidence that its use leads to services that increase patients’ participation in services production (Crisan, 2022). P6 utilizes workstations on wheels. P6 stated

This mobile mechanism has a scanner and a computer combination. The workstation on wheels takes Epic to be bedside for the convenience of the patient and staff member. The scanner identifies the patient information by imaging the barcode on the patient's medical bracelet along with identifying medication.

Another device is an intravenous line (IV) finder which is an ultrasound device for locating veins when there is a problematic IV stick in withdrawing blood from the patient.

P7 stated: "They use EMR and Epic as a technology tool for convenience." In addition, P8 added to the conversation by stating:

A tag that is provided by our organization which makes the use of technology, systemwide. Tag means that the organization provides system wide IT support and various resources to employ. The IT support system-wide creates uniformity of patient care so that you're not getting a hodgepodge of different cares of one facility versus another. A great feature is that it allows the facilities to ensure that all of the various support staff, from the radiology imaging to the EMR system, are able to understand the technology which permits the best patient care.

IT is currently used as a tool to improve the way service development is made, improving the communication between health care professionals and patients, but also capable to track the improvement process (Crisan, 2022). Research has found that technology aids in a variety of ways, like assessing medical supplies files, encountering computerized learning with pharmacologic cautions, successful implementation of health and treatment regions, and the possibility of reassembling (Vyas et al., 2022). P9 stated:

Identifying the electronic communications such as chat and texting back and forth within dimensions can be an efficiency tool in allowing communication to continue even in a surge such as COVID. Other times, electronic communication serves as an efficiency tool during downtime. Technology draws data to view such as EMR, however, one must be educated enough to interpret the data, excellent and terrible, while understanding the conclusions to avert misconceptions to increase effectiveness of the ED operations. The EMR is an instrument in noting when actions are taken including date and time, particularly CT scan, lab orders, or test results. Notifications of results utilizing “to notify me device” can come through your apple watch without having to contact the physician. An example is: there are ten patients of which sixty x-rays are among them and seven or eight need a prompt decision. One can click on seven or eight patients and make your next decision. Leveraging the technology for notification of a specific test result is just one of the tools that we use that helps facilitate care efficiently. The outcome of each test determines the next steps in providing efficient care as well as feedback to patient and family.

Further, P10 acknowledged by stating: “EMRs have grown to include many capabilities with the introduction of the vault phones have been helpful for med scanning charging for our safety attendants (SA). The vault phones play an intricate role with EKGs by providing Bluetooth and Wi Fi capabilities to upload information into a patient’s chart. P11 stated:

Prior to the EMR, it was difficult to get accurate numbers in terms of LOS and time and departure of patients. Tracking the adult and pediatric ED times and departures were different because it was computer-based charting. However, the implementation of Epic made the distinction.

P12 stated:

Technology can be viewed as being a blessing and on some occasions, a hindrance considering having a good track board. We can move around the track board which enables us to keep up with our patients. Using chat and vault is valuable with serving the community and others.

In addition, P13 stated:

They discovered that Epic increases everything in the operation including providing medicines. The technology of Epic aids us complying with the red rules. It safeguards us in getting medications to the correct patient. It also makes for a sounder environment for patients and us. Vault phones takes training and adaptation. The phones come with a lot of amenities as a hand-held device since computers can be slower at times. Having the vault as a ready tool allows you to treat patients in the hallway with all its scan gadgets and not have to chase down a computer to input information. Overhead paging is a resourceful device when attempting to locate a staff member. Translators and iPad translators are significant devices as we have a large population that speak other languages such as Spanish and Vietnamese.

To make the necessary transformation toward a new vision of health care, leaders must rethink and redesign health service systems to leverage technology and empower people in creating their health care path (Patrício et al., 2020). Technology offers immense opportunities to enable people-centered, integrated care, which demands connected, intelligent information systems with adequate user interfaces (Patrício et al., 2020).

The theme of the use of technology is supported by the CAS conceptual framework. For instance, McCarthy (2003) used CAS to elaborate a technology management model. Essential elements of CAS models can help shape organizational systems with schemas, self-organizing networks supported by energy imports, systemic evolution, and recombination (Anderson, 1999). The CAS behavior provokes, in the system, effects, characteristics, and different orders as emergent novelties, which are embedded in the organization's technology.

Communication Among Physicians, Staff, and Patients.

Communication among physicians, staff, and patients is the key to health care. The ED represents the interface between health care systems and the communities in which they are situated (Meisel et. al, 2022). P1 stated: "Daily huddles are held and consist of a charge nurse leadership team and providers to produce a plan of the day." P2 stated:

The ED physicians operate best with face-to-face communication. The other communication includes the vault phone and Epic chat. A vault phone can be successful on certain things, but you may get a message, and it falls by the

wayside because of information overload. Other information overload can be getting messages from Epic, from a phone call, from someone tapping you on the shoulder to vault simultaneously.

Communication must begin as soon as possible. P3 stated to the theme by stating: “Each physician uses their technique in caring for patients but all have the goal to interface with the patient as quickly as possible. In addition, P4 stated: “Their facility views communication strategies face-to-face as an opportunity to clarify what is heard and spoke, hence eliminating miscommunication.”

As noted by Tim Brown, the founder of design thinking, it is important that design teams possess several core skills to make this process most successful (Aaronson et al, 2020). Communication skills, which include empathy, integrative thinking, optimism, experimentalism, and collaboration, are all possessed by many in the health care field, making this a natural tool to be employed by hospitals and health care (Aaronson et al, 2020). P7 stated: “Communication is important when it comes to patient safety and everybody is more receptive when you talk to each other, respectfully.”

Other participants focused on communication tools. P5 stated: “The facility uses email, text, and podcasts for effective communication. Podcast allows weekly updates. The physicians meet with physicians’ staff and medical directors from all physician groups while meeting nurse managers monthly to discuss opportunities.” P6 stated: “The ED uses chat as a form of communication which is available on Epic. Hand-held radios and vault phones are a huge asset because access is just a button away.”

P8 stated: The communication is multifold.” P8 identified scheduled department meetings and the use of emails and text messages. P8 stated: “We have quarterly meetings. I do frequent email communications as well as one-on-one communications.” P8 also discussed the need to communicate with “team members, physicians, and mid-levels to make sure that the information about our processes is disseminated appropriately and are being observed.” P9 added to the theme by stating:

The ED runs effectively on nonverbal communication because if you must call someone, move about to find a staff member, if it is noisy, or you cannot view the ED, then electronic communication becomes inedible such as chat, text, and so forth. The phone is used to call the Pivot desk, a unit, or to a different nurse. Email plays an intricate role in updating people, informing them of the next meeting, and face-to-face with zoom. This method of communication is a valuable resourceful since the COVID pandemic as it keeps staff and patients informed. Talking directly to physicians and APPS permits me to see and hear prospects for improvement or to receive feedback. Specific conversations on follow ups ensures that everyone is in alignment with the same goals.

P10 noted that: “The introduction of the vault phones has been very helpful for med scanning and for charging for our safety attendants.” In addition, P11 noted the importance of using multiple technology for communications: “We have meetings, sometimes in person or by zoom meeting with the ED doctors, and then email, and text. our group.” P8 added that “if it's something more urgent sometimes I'll just text them say ‘hey heads up’ to let the group know about an urgent matter.”

P12 stated: “Between the ED physicians and the staff, sometimes have different views.” P12 emphasized the importance of “closing the loop between communications by giving the order and asking the patient to repeat the order.” This process makes sure that everyone understands what is being said. P13 stated:

Working in the ED directly beside patients makes caring for the patient easier. we are we work directly beside our positions. Our communication strategies are 95% verbal. Verbal communication between the physician and the nurse in what is expected in the patient plan of care is necessary for the patient and patient’s care. For example, we have a patient in the waiting room who has been there between three to four hours, and everything comes back good, then I can discharge the patient with discharge instructions. If the physician is not able to come up to us and have a verbal conversation, or the nurse is not able to, we can do it in a quick manner through the comment section in Epic.

Physicians are trained to consider objective data, facts, and processes to assess patients and deliver care (Slonim, 2022). The conceptual framework highlights the importance of direct and indirect consequences that are critical to implementing successful strategies in a platform economy (Poniatowski et al., 2022). The COVID-19 pandemic has impacted the demand, supply, and capacities of health care systems worldwide (Leite et al., 2020). [Bohmer et al. \(2020\)](#) argued that a pandemic generates an untenable demand shock for health care systems constrained capacity. The conceptual framework is defined as an environment that includes relevant elements for a given purpose (Kozjek et al., 2020).

Applications to Professional Practice

Facing challenges in quality, patient safety, and cost, the health care industry is striving to transform and embrace the leadership practices of successful business organizations (Satiani et al., 2022). Patients must feel comfortable with the physicians who are providing services to them. Achieving this transformation requires physician leaders (Satiani et al., 2022). However, equipping emerging leaders with the necessary skills to drive change and develop transformative policies calls for systemic, cohesive, sustained, and data-driven educational efforts (Satiani et al., 2022).

Health care professionals should center their work on health care consumers and view their role as improving these individuals' health (Fifer, 2022). However, factoring health equity into everything that health care professions do when is daunting after 2 years of pandemic life (Fifer, 2022). At present, health care in the United States has gotten to a point where trust is declining, costs are outpacing inflation, the financial toll exacted on society is increasingly unsustainable, and business practices are largely consumer-unfriendly (Fifer, 2022). Patients can feel a sense of insecurity or vulnerability in not knowing what to expect from the results of the physicians or practitioners' findings. Contemporary digital lifestyles have radically transformed the conventional landscape of business and consumerism, as evident from the variety of e-initiatives (any action a company makes to bring a business online or to increase its online presence) successfully launched over the past several decades (Stephanie & Sharma, 2020).

With the internet and digital services dominating many key aspects of day-to-day living, online means of communication, entertainment, education, banking, and a host of

e-commerce transactions are not merely convenient but tangibly efficient, cost-effective, and timesaving (Stephanie & Sharma, 2020). Online medical platforms help to handle rapidly increasing patient volume and further disperse useful medical information to the general public through online social interactions, therefore realizing broader social benefits (Yang et al., 2021). It is especially important to educate customers on how to use online information as some may not have technology knowledge. Customer satisfaction and perception of quality are important for the profitability and sustainability of any organization (Materla & Cudney, 2020).

Implications for Social Change

Implications for social change begins with educating each staff member the importance of patient care regardless of the level of acuity. Throughout the United Kingdom, the National Health Service struggles to meet demand and achieve performance targets. Services need to work with individuals and communities to reduce avoidable disease and dependence (Willson & Davies, 2021). While few commentators would say that all things in Scotland are good, the Scottish health and social care system has ‘benefited from a continuous focus on quality improvement and engaging the altruistic professional motivations of frontline staff to do better and building their skills to improve (Willson & Davies, 2021). Physicians can be advocates for patients because they are the ones who diagnose and decide the next steps of care. Success is defined based on specific measurements of safety and effectiveness that make sense (Willson & Davies, 2021). Less attention has been paid to the ethical challenges faced by SEs when they initiate the process of social change (Bhatt, 2022). Social change is essential because of

the various cultures that health care professionals serve. Social change is a value-driven process, and substantial ethical questions arise regarding what principles should guide social change and how societal reform should unfold (Sutter et al., 2019). Instead of prioritizing profits, social enterprises (SEs) aim to balance economic benefits, ecological sustainability, and social equity (Yang et al, 2021).

Recommendations for Action

Providers are overloaded; sometimes, staff does not equal the number of patients. The overload dilemma is seen in the United States and among other countries. In health care, patient's needs and perceptions of quality are dynamic considering the rapid changes in health care costs, technological advancements, and patient demographics (Materla & Cudney, 2020). Increasingly, patients expect to be able to co-determine their medical providers and treatments. The outcome can benefit the patient but may not be medically conclusive. Therefore, the emergency room can continuously work on reducing the wait time in seeing providers, thus reducing readmissions and increasing patient satisfaction scores. Most patients rely on recommendations through solid ties, like family and friends (Martin et al., 2021). I plan to work with my Chair and disseminate the results of my research at academic conferences and publish in a peer-reviewed article.

Recommendations for Further Research

There are continued opportunities for operational strategies to improve in the ED. With the number of patient cases stemming from COVID-19 and other viruses on the rise, the research will be an ongoing battle. An ED plays the unique role of the gatekeeper in health care systems (Chen et al., 2020). To address systemic problems amplified by

COVID-19, health care leaders need to restructure U.S. long-term services and supports as they relate to both the health care systems and public health systems (Dawson et al., 2021).

Researching the length of time, it takes for an individual to consult after symptom onset is not a simple task (Dobson et al., 2022). Whether triage targets can be achieved has been an imperative assessment of service qualities for an ED in health care management (Chen et al., 2020). I recommend that health care organizations continue to hire experienced qualified medical staff. For the new medical graduates, I recommend that training is extensive and acclimate hands on training versus shadowing.

Reflections

I was privileged to interview 13 medical staff members in leadership roles. Following the guidelines of a semistructured interview, each participant had open-ended questions for the subjects in relation to ED operational strategies, which were (a) triage operational strategies, (b) wait-time protocol, (c) use of technology, and (d) communication among physicians, staff, and patients. My experience within the DBA Doctoral Study process allowed me to gain knowledge and understanding of what operational strategies in the ED entail. Coming from an administrative background in the ED allowed me to see and experience firsthand the operational issues of an ED and gain respect for the ED professionals.

Education has always been and will always be a part of my life. However, I never anticipated pursuing a doctoral degree. I completed a dual master's degree in health administration and business administration in less than 3 years. During this journey,

challenges were on every hand, from theft of identity to caring for our child, who had intervals of hospital stays. My husband and I would take turns and spend the night together in the hospital while maintaining separate jobs. Throughout my doctoral journey, I experienced challenges. Nevertheless, faith in God and perseverance kept me afloat.

When writing the last section, Section 3, I received a breast cancer diagnosis. A month later, I had 20 treatments of radiation. The experience was exhausting. Nevertheless, I held steadfast, remained determined, and never withdrew from school while maintaining my employment. Some individuals noted that they could not see how I could function in the capacity that I did. My response was to thank God for enabling me to withstand and sustain my mental and physical capacity to encounter such an endeavor.

Conclusion

The purpose of this doctoral study was to explore the operational strategies used by ED leaders. I found that the ED is one of the most challenging departments in a hospital. When the ED door opens, providers never know what to expect. This study gave me the opportunity to gain insight from health care leaders who have developed operational strategies for EDs. The emergence of COVID-19 and continued growth of other diseases have added further challenges to the work that these professionals perform. As my findings show, there are strategies to mitigate ED operational issues, but these may still be circumstances that limit the efficient delivery of patient care.

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Appendix A: Interview Protocol

Title: Emergency Department Operational Strategies

I started the interview process by greeting the participant, introducing myself, and thanking them for volunteering for the interview process. Next, I notified the participant of my intention to record the interview and addressed any questions or concerns. Then, I began recording. I explained the research topic and goals and asked if the participants had any other questions or concerns before the interview process began. Following are specific steps that I took:

- I reminded the participants of the voluntary nature of the study and let them know that they could remove themselves from the interview process at any time and for any reason.
- I made sure that participants reviewed the interview questions and asked any follow-up or clarifying questions prior to signing the consent form.
- I ensured that I provided the participant a copy of their signed consent form for their records.
- I informed the participants of the recommended time of 30 minutes for the interview and reminded them that the interview would be audio recorded.
- I then initiated the interview process.
- I explained to the participants that their interviews would be transcribed and that I would provide them with a transcription of the interview for data validation and clarification purposes.
- Once the interview concluded, I thanked each participant for their time and

asked them if they had any additional questions or concerns, which I addressed before I stopped the recording process.

Appendix B: Letter of Cooperation

[company letterhead]

Date:

Dear Joyce Davis

Upon my review of your research proposal, I would like to express my support and give authorization for you to conduct the study entitled “Emergency Department Operational Strategies.” As part of this study, I authorize you to interview [identify your participant requirements]. Individual’s participation in the study will be voluntary and at their discretion.

We understand that our organization’s responsibilities include providing contact information to potential participants, including technical and managerial staff. We are also, providing elective health services resource documents and providing a conference room or office space to conduct private interviews. We reserve the right to withdraw from the study at any time if our circumstances change.

I understand that the student will not be naming our organization in the doctoral project report that is published in ProQuest. No identifiable information is to be extracted from this study.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization’s policies and procedures.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's research team consisting supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Appendix C: Introductory Letter

(Date)

(Contact Information)

Dear Prospective Participant,

My name is Joyce Davis. I am a student at Walden University pursuing my doctoral study in Business Administration with a specialization in Finance. I am conducting case studies anonymously, referencing Emergency Department Operational Strategies.

Your feedback will be anonymous; therefore, I will name you as Participant (A, B, etc.). To participate in the study, you must be in an Emergency Department leadership role with clarifying credentials. An enclosed Informed Consent Form offers detailed information about the study. The interview will be through Zoom, lasting approximately 30 minutes. A recorder will be in use to document comments, and you will have an opportunity to clarify substantiate your information. If you have questions or need additional information, please contact me at [email address redacted] or [telephone number redacted].

Sincerely,

Joyce Davis