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Leadership Strategies for Reducing Medical Errors

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
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Walden University
2024

Abstract

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MS, Walden University, 2011

BS, Walden University, 2009

Doctoral Study Submitted in Partial Fulfillment

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Abstract

Medical errors can be preventable with ongoing education and training. However, some health care leaders struggle to develop and implement new strategies for reducing medical errors. Healthcare leaders must develop and implement new strategies to reduce errors, as medical errors may lead to a decrease in patients seeking medical services, financial liability, and a lack of community trust. Grounded in transformational leadership theory and the define, measure, analyze, improve, and control process, the purpose of this qualitative single case study was to explore leadership strategies for reducing medical errors. The participants included six healthcare leaders with 5 years of experience at a single hospital in Southern California. Data were collected using semistructured interviews. Thematic analysis resulted in the emergence of five common themes: (a) team collaboration; (b) team communication; (c) coaching, education, and training; (d) performance improvement; and (e) leadership. A key recommendation is for health care leaders to include healthcare workers in the feedback loop when developing new strategies and introducing new product lines and processes. The implication for positive social change includes the potential for higher quality care, reduced medical errors, and increased community trust.

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Dedication

This study is dedicated to my mom, who passed away from Alzheimer's disease in 2021. A special thanks to the health care workers for their dedication in providing quality care to both the patients and patients' family members. I would like to recognize the health care workers who became surrogate family members to patients because of the ongoing pandemic, as health care facilities restricted in-person visitation.

To my late husband, Miles Kitasato, and my two sons, Christopher, and Jonathan Tsang, who encouraged and supported me during my doctoral journey. To my friends and family members, thank you for your support and encouragement. I would also like to dedicate this project to my two special friends, Barbara Helliwell, RN, and Lane Moody, who have supported me throughout this journey and would not let me give up on my promise. I would like to recognize Noelani Warren, director of quality management, who mentored and guided me throughout the last phase of my doctoral journey. Additionally, I would like to recognize Noelani Warren who accepted my invitation to become my mentor when Annee Turner stepped down. Also, I would like to recognize the health care leaders for their love and passion for improving the delivery of patient care and reducing medical errors.

Acknowledgments

I acknowledge my former chairperson, Dr. David Smith, for his support, guidance, dedication, and feedback during my doctoral journey. I would like to acknowledge my new chairperson, Dr. Walter McCollum for his support and encouraging me to complete my study. I acknowledge my second chairperson, Dr. David Moody, for support and feedback; Dr. Reginald Taylor, university research reviewer; and Dr. Gail Miles, program director. Thank you for all your support and feedback.

I acknowledge and recognize the individuals who participated in this study for their support and feedback. Thank you for taking the time to take part in this study and sharing experiences for addressing medical errors.

Table of Contents

List of Tables

Section 1: Foundation of the Study

Adverse events occur during care delivery, resulting in medical errors and increased health care spending in the United States by $43 million annually (Hannawa et al., 2016; Starmer et al., 2014). Medical errors are injuries causing complications in a patient's medical management that do not relate to the primary reason for admission (Suzuki et al., 2014). Medical errors may affect both patients' and health care workers' emotional well-being and include providing treatment to the wrong patient, performing wrong-site surgery, administering the wrong medication or dosage, equipment failure, and slips, trips, and falls that cause patient harm. The health care workers' attitudes and behaviors may directly or indirectly influence the occurrence of adverse events causing a medical error. The health care workers must be able to interact with a multidisciplinary team to promote team collaboration, communication, situational awareness, and the ability to respond to and mitigate risk issues (Petitta et al., 2015). In this study, I researched leadership strategies that, if implemented, may lead to a reduction in medical errors, as well as an increase in organizational profitability.

Background of the Problem

Medical errors occur when health care workers and patients are unfamiliar with or experience stress or other obstacles in their surroundings, when multidisciplinary teams have breakdowns in communication, and when biotechnicians do not maintain medical devices to ensure their effectiveness (Koehn et al., 2016; William et al., 2014). Work pressures, lack of knowledge, skill deficits, and other environmental factors in the safety climate may directly and indirectly influence a patient's care (Mitchell et al., 2015). The

failure of multidisciplinary teams to communicate clearly and mitigate risk issues may result in medical errors that influence the delivery of care (Suzuki et al., 2014). An example of a communication breakdown resulting in a wrong site procedure is when the surgical team performs a procedure on the left shoulder, but the consent is for the right shoulder. An indirect medical error occurs when health care workers fail to follow policy and procedures in patient care, thereby increasing a patient's length of stay. Some examples of indirect medical errors are patient falls and hospital-acquired pressure injury or infections due to health care providers not following the appropriate procedures.

The culture of safety and the prevalence of medical errors affect the environment and influence the delivery of care provided in health care settings. Health care leaders struggle to implement new strategies for improving the culture of safety by reducing medical errors. Challenges can emerge regarding how to sustain the learning process after health care leaders implement new processes in educational and training contexts aimed at improving health care workers' knowledge and skills (Goliat et al., 2013). In this study, I investigated strategies that may reduce preventable and unintentional medical errors causing patient harm leading to increased health care cost, emotional distress, and loss of organizational profitability.

Problem Statement

Preventable and unintentional medical errors causing patient harm leads to increased health care cost, emotional distress on both patients and providers, and loss of productivity (Atanasov et al., 2020). The third leading cause of death in the United States is medical errors caused by an unintentional error, affecting an estimated 200,000 patients

(Aljabori & Kadhim, 2021). The general business problem is that medical errors result in poor quality patient care and loss of organizational profitability. The specific business problem is some health care leaders lack strategies to reduce medical errors to improve organizational profitability.

Purpose Statement

The purpose of this qualitative single-case study was to explore strategies some health care leaders use to reduce medical errors to improve organizational profitability. The targeted population included health care leaders located in Southern California who oversaw the operations of a single hospital and who had been successful in developing and implementing strategies to reduce medical errors. The implications for positive social change include the potential to improve patient safety and communities' trust.

Nature of the Study

Researchers conduct studies using one of three research methods: qualitative, quantitative, or mixed (Fassinger & Morrow, 2013). I considered all three research methods for the purposes of this study. A quantitative methodology involves applying a rigorous approach to determine relationships or differences among multiple variables (Denzin & Lincoln, 2011). The quantitative approach was not appropriate for this study because I did not focus on or test a hypothesis related to the number of medical errors. Instead, I focused on identifying and exploring strategies for reducing medical errors. Mixed-methods research involves a combination of qualitative and quantitative techniques (Almalki, 2016; Hall & Roussel, 2016). In mixed-methods studies, the researcher conducts an extensive research study following the replication design method

that predicts similar or contrasting results (Yin, 2018). Therefore, the quantitative approach was not appropriate for this study because I did not focus on testing a hypothesis, differences in variables, or the relationships between two groups but on reducing medical errors at a single hospital. The qualitative method involves collecting and analyzing the participants thoughts, feelings, and experience (Sutton & Austin, 2015). Because this study called for gathering in-depth data about a specific phenomenon, the qualitative method was most appropriate for me to identify and explore strategies for reducing medical errors, improving organizational profitability, and reconstructing the participants' experiences.

I considered using these three qualitative designs for this research study: narrative, phenomenology, and case study. A narrative design involves a researcher gathering information and reframing events in chronological order, and with emphasis is on telling the story of individuals' personal life experiences (De la Porte, 2016). The narrative design was not appropriate for this research study because the focus of this design was on gathering the experiences of leaders. The information gathered in this study encompassed the business-related experiences of hospital leaders at a single hospital. I did not select the phenomenological design for this study because the focus of the phenomenological design is understanding the personal meanings of individuals' lived experiences (see Guba & Lincoln, 1994).

By using a case study design, a researcher investigates a phenomenon to understand the topic that may include a single individual or group of individuals (Heale & Twycross, 2018) The case study involved identifying new strategies health care leaders

may use to reduce medical errors. I selected the single-case study method for this study to narrow the focus on a single hospital facility. A multiple case study would not have been an appropriate design for this study because a single-source was used to identify strategies to reduce medical errors at a single hospital. A single-case study is appropriate for a study that focuses on a single-source and enables the use of interviews, documentation, and secondary sources for data collection (Gustafsson, 2017; Yin, 2018). For the purposes of this study, the single-case study was appropriate for identifying and exploring strategies that health care leaders may use to reduce medical errors.

Research Question

The research question for this study was as follows: What strategies do some health care leaders use to reduce medical errors to improve organizational profitability?

Interview Questions

1. What are some strategies that you used to prevent and reduce medical errors that improved your hospital's profitability?
2. How did you assess the effectiveness of the strategies and initiatives for reducing medical errors?
3. How did you implement new performance improvement strategies to decrease medical errors?
4. Based upon your experience, how did the strategies transform behaviors and attitudes to reduce medical errors?
5. What were your key barriers to transforming employees' behaviors and attitudes to reduce medical errors?

6. How did you overcome the key barriers to improve health care workers' commitment in reducing medical errors?
7. What additional information would you like to share about the strategies that reduced medical errors to improve your hospital's profitability?

Conceptual Framework

The transformational leadership (TL) theory and the define, measure, analyze, improve, and control process (DMAIC) served as the composite conceptual framework for this study. The TL theory, developed by Bass (1985), defines leadership behaviors as positively influencing followers' behaviors and improving team motivation (as cited in Northouse, 2013). The four qualities of transformational leaders that influence the behaviors and attitudes of followers are motivation, consideration, influence, and stimulation (Chan & Mak, 2014). In developing followers' trust and performance, leaders can interact with health care workers and transform their attitudes and behaviors, which can promote positive changes in workers' performance (Menci et al., 2016). Therefore, transformational leaders' ability to influence health care workers to improve their behaviors may lead to a reduction in medical errors.

Transformational leaders who commit to leading by example may have a strong influence on employees' attitudes and behaviors. The two elements with the leadership performance and behaviors in the team environment include (a) relations and task support and (b) provision of emotional support. Chan and Mak (2014) noted that leaders' ability to provide a comprehensible vision for implementing new strategies may influence positive changes in followers' behaviors and attitudes that support a team environment.

Transformational leaders influence changes in behavior by listening to the needs and concerns of employees and initiating open communication that will provide mutual support to a group of individuals or an individual (Masa'deh et al., 2016).

The DMAIC method is a tool that provides a roadmap for developing a continuous performance improvement process consisting of five steps: define, measure, analyze, improve, and control (Lawati et al., 2018). The DMAIC methodology includes using Lean Six Sigma to identify the parameters for each of the five steps (Kuwaiti & Subbarayalu, 2016). In the first step, health care leaders define gaps and develop new strategies for reducing medical errors. In the next step, the health care workers measure and validate collected data and ensure the data are adequate for analysis. Health care leaders analyze data using flow charts and diagrams to interpret the data to identify new gaps and modify the performance process during the improvement phase. Finally, leaders control the process by continuously monitoring the number of occurrences of medical errors using the performance improvement process (Kuwaiti & Subbarayalu, 2016).

Using composite conceptual framework that includes the TL and DMAIC in this study can provide information that other health care leaders may use to develop new strategies for reducing medical errors. Therefore, I used the DMAIC process and TL theory to identify and understand the strategies the hospital's leaders use to develop, deploy, and catalyze the implementation of strategies for identifying and improving key processes that would reduce medical errors.

Operational Definitions

The following key definitions appear in this study:

Communication breakdown: Communication breakdown is the inability to speak up and convey messages affecting the patient's safety (Morrow et al., 2016*).*

Contingent rewards: Contingent rewards is an active exchange between leader and follower resulting in a rewards or recognition (Saeed & Mughal, 2019).

Culture of safety: The culture of safety encompasses a shared mental model that includes the attitudes, beliefs, and perceptions of a multidisciplinary team (Petitta et al., 2015).

The define, measure, analyze, improve, and control (DMAIC) method: The DMAIC method design is a quality improvement process used to define the problem, measure, analyze metrics, improve process, and control the validity of the data (Improta, et al., 2017).

Indirect and direct medical errors: Indirect and direct medical errors are errors that occur, causing patient harm is a direct medical error, whereas a nonclinical situation influences an indirect medical error (Mayo & Duncan, 2004).

Multidisciplinary team: A multidisciplinary team is a group consisting of two or more professionals from different specialties, such as physicians, nursing, dieticians, or radiologists working together to improve patient safety (Starck & Rooney, 2015).

Safety climate: Safety climate is the perceptions of individuals toward policies and practices relating to safety, including safety education and training, communication, and leadership support (Liu et al., 2015).

Situation, background, assessment, recommendation (SBAR): SBAR is a tool used by workers to provide and distribute information during an emergency (Kesten, 2011).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are interpretation that individuals may understand as true without verification based on their experiences (Kirkwood & Price, 2013). The first assumption was that the selected participants could verbalize their experience with the research study phenomenon. The second assumption was that the health care leaders had the knowledge and skill to share personal experience related to this phenomenon. The third assumption was that the participants would answer the questions honestly and without bias about their experience related to the phenomenon. The fourth assumption was that I could comprehend and analyze the data accurately.

Limitations

Limitations of a study are potential weaknesses in the study (Marshall & Rossman, 2016). The research setting was a hospital with which I had an affiliation. The first limitation was the small sample size of participants of health care leaders. Limiting the research to health care leaders with 5 years of experience may have alienated the health care workers who may have had valuable information for improving processes to reduce medical errors. The second limitation was that there may be differences in the health care leaders' knowledge depending on their experience in reducing medical errors. New strategies implemented based on the services provided may vary from specialty to specialty. The focus in this study on one specialty may have limited the generalizability of the study to other specialties. The third limitation was my knowledge on strategies

used for reducing medical errors, which may have limited the richness of data collection process.

Delimitations

Delimitations are boundaries and criteria a researcher sets for a study (Denzin & Lincoln, 2011). The first delimitation was that the participants must have had at least 5 years of experience in a health care leader role and be knowledgeable in developing new strategies for reducing medical errors. This delimitation may have precluded the gathering of pertinent insights from other health care professionals. Still, the selected participants' experiences yielded insight on new strategies for addressing medical errors. The findings reinforce that developing and implementing new processes for improving patient safety may reduce medical errors. The third delimitation was that the participants needed to have experience with identifying solutions for reducing medical errors.

Significance of the Study

Contribution to Business Practice

Hashemi et al. (2012) identified a gap in health care workers' exemplary performance and nonperformance as a vulnerability in the health care system that would lead to medical errors and loss of revenues. The significance of this study is to improve business performance and the potential to identify leadership strategies for reducing medical errors. Health care leaders could use these findings to help develop and implement new strategies for improving the performance of the health care systems and workers in reducing medical errors, leading to an improvement in organizational profitability.

Implications for Social Change

The results in this study could improve health care processes and workers' ability to reduce adverse medical outcomes. The implications for social change with improvements in clinical practice and in nonclinical areas that can lead to better community health care outcomes. The findings in this study could contribute to social change by leading to a higher level of quality care, reduced medical errors, and increased community trust. The results could improve organizational profitability and allow for the sustainable funding of community outreach programs provided by the hospital.

A Review of the Professional and Academic Literature

The purpose of this literature review is to add to the body of knowledge related to strategies for improving the culture of safety in reducing medical errors. In this subsection, I reviewed existing literature on communication and team collaboration; health care workers' attitudes, attributes, and behaviors; the culture of safety; medical errors; and leadership models. In discussing the conceptual framework, I explored literature related to TL theory, transactional leadership theory; social learning theory, Hill's leadership model for team leaderships and the DMAIC process; the causal effects that may influence medical errors and increase the risk of medical errors; the methods health care leaders may use for improving the patient safety in reducing medical errors; and health care leaders' strategies for improving team communication and collaboration to improve health care workers' attitudes, attributes, and behaviors.

I searched for peer-reviewed articles in multiple databases to develop this literature review. Through the Walden University Library, I accessed the following

databases to search for research materials: Emerald Management, ProQuest, Nursing and Allied Health Source, Science Direct, Academic Science Direct, Academic Search Complete, EBSCOhost, and Google Scholar. The keywords search terms used were *leadership, communication strategies, multidisciplinary team, team collaboration and communication, safety behaviors, culture of safety, medical errors, transformational leadership,* and *transactional leadership.* The literature review includes 137 peer-reviewed articles and books, of which 59% were published within 5 years of the CAO approval of this study.

Leadership Theories

In this study, I focused on research leadership styles that may influence health care workers' attitudes and behaviors to reduce medical errors. TL, transactional leadership, and social learning theories were selected that explained how the leadership attitudes and behaviors may improve the quality of care the health care workers provide, thereby reducing the number of medical errors. In TL theory, Bass (1985, as cited in Howell & Avolio, 1993) described the leaders as influencing the workers to develop a self-system that aligns with the organizational mission and vision. Saeed and Mughal (2019) noted the five TL attributes that influence health care workers are idealized influence behaviors, attitude, inspirational motivation, individual consideration, and intellectual stimulation. The guidance of the transformational leader may influence and improve the health care workers' performance to reduce medical errors. Transactional leaders, on the other hand, influence health care workers' attitudes and behaviors by using contingent rewards (Saeed & Mughal, 2019). Under this leadership style, the health

care workers may receive a reward or recognition for developing new processes and workflows to avoid and prevent a medical error. Some examples of workflow processes include improving methods for identifying patients with the same name and located in the same unit and medication that looks alike or sound alike. Social learning theory is another form of leadership style in which the health care workers observe the leaders' attitudes and behaviors. The health care leaders may use different methods to increase team collaboration and communication for improving the health care workers' attitudes and behaviors.

The TL theory and the DMAIC process provided the foundation for this study strategies for increasing health care workers' commitment to improving the culture of safety in reducing medical errors. I selected the TL theory and DMAIC process because the influences of TL theory provide a positive foundation for implementing new processes, which can be developed using the design of the DMAIC process. The focus was how the health care leaders can transform the health care workers' behaviors and attitudes to improve the treatment and services health care workers provide to patients and patients' families resulting in an improvement in the culture of safety. The goal of this study was to explore existing strategies health care leaders use to improve the safety culture and reduce medical errors.

Health care leaders' attitudes and behavior may motivate the health care workers through their leadership and setting of a good example to the health care workers. The TL theory focuses on improving teamwork, attitudes, and behaviors, which are used to develop health care workers' performance (Jambawo, 2018). By combining the DMAIC

process and the TL theory, the health care leader may be able to identify the contributing factors that relate to the medical errors by (a) defining the problem and project goals, (b) measuring key aspects and relevant data, (c) analyzing the data and identifying the cause-and-effect, (d) improving the processes and making changes that affect the behaviors, and (e) controlling the process by adjusting the steps to obtain the project goal (Monlouis, & Robinson, 2013). With the combination of the TL theory and DMAIC process, the leaders may improve safety culture and develop the health care workers' attitudes and behaviors to reduce medical errors.

TL attitudes and behaviors may influence health care workers' poor behaviors. Unethical behavior is defined as an illegal activity that violate the organizational practices that may influence the health care workers' poor decision-making practices (Eisenbeiβ & Brodbeck, 2014). Unethical behaviors and poor treatment can cause resentment among the health care workers that may influence an increase in the number of medical errors. they commit. Leaders who exhibit ethical behavior and treat health care workers with respect can influence and improve health care workers' behaviors (Jambawo, 2018). TL behaviors may promote health care workers' engagement with health care team performance and the organization's shared vision for improving safety culture in reducing medical errors. Leaders may transform and help health care workers reduce medical errors through team building and improving team communication (Aga et al., 2016). Transformational leaders may influence the health care workers' performance, attitudes, and behaviors by treating them with respect.

TL

The transformational leader encourages the workers by developing and communicating a shared vision and influences attitudes and behaviors to achieve a shared goal (Galli et al., 2017). The transformational leader role model develops, influences, and motivates health care workers by communicating a shared vision by the organization (Herawati, 2017). The health care leader's ethical and unethical behaviors reflect how the transformational leader can transform the health care workers' attitudes and behaviors. (Jambawo, 2018). The transactional leadership styles influence the health care workers' attitudes and behaviors with the use of rewards and corrective action to achieve a desired result with the health care workers' performance. Health care workers' attitudes and behaviors and performance and engagement positive attitudes is the influence of the health care leaders.

Transformational leaders encourage and improve the health care workers' attitudes and behavior by providing them with positive feedback on their job performance. Balwant (2019) noted that leaders providing positive feedback and encouragement as well as sharing the organization vision in reducing medical errors promote improved performance. Leadership attitudes and behaviors may improve the health care workers' performance by building a climate of trust in the organization (Olcum & Fayda., 2015; Schaubroeck et al., 2016).

Leadership Styles

In this literature review, I will explain the following leadership styles: transformational, transactional, strategic, and coach-style. Paterson and Huang (2019)

noted that leaders may transform the workers using the role theory or social learning theory. The health care leaders use role theory to develop the health care workers' behaviors by modeling behaviors. The social learning theory addresses learned behavioral through observation. Health care leaders may transform and influence the health care workers' attitudes and behaviors to reduce medical errors. Health care workers may adjust behaviors by observing role models.

Transformational and Transactional Leadership Comparison

Both the transformational and transactional leadership styles is used to transform the employees' performance, attitudes, and behaviors. Transformational leaders transform and motivate the workers toward the organizational goals (Jensen et al., 2019). Transactional leaders transform employees by using rewards for achieving the desire performance and corrective action for unacceptable performance (Groves & LaRocca, 2011). A health care worker's unacceptable performance may influence the delivery of patient care that may result in corrective action. The transactional leaders motivate health care workers through the use of incentives to reward employees for successfully meeting project deadlines and excellent performance. Substandard performance results in punitive or corrective actions (Bian et al., 2019). Jensen et al. (2019) noted that transactional leaders offer three types of contingent rewards for behaviors: nonpecuniary, pecuniary, and contingent sanctions rewards. Transactional leaders transform and motivate individuals using rewards that provide incentives or punitive or corrections based on the workers performance.

TL Behaviors

The transformational leader influences and inspires health care workers to improve their attitudes, behaviors, and performance to achieve organizational vision. TL researchers have studied social learning behaviors and attitudes that may improve the health care workers' performance. Hoch et al. (2018) studied how transformational leaders' ethical behaviors may influence the workers' behaviors. Horsburgh and Ippolito (2018) noted that social learning might influence health care workers' ethical or unethical behaviors by observing or imitating a role model. Tabassi et al. (2017) noted that leaders might improve team performance by encouraging health care workers to maintain their skill set and competencies to achieve the project goal. Improving the health care workers' attitudes and behaviors influenced positively by a transformational leader, resulting in the improvement of workers' performance.

Burns's (1978) transformational leader theory addresses the process for developing and transforming the behaviors of both the leader and worker behaviors to a shared interest (as cited in Hoch et al., 2018). In 1985, Bass continued to develop the theory to focus on improving worker performance, finding that whether the leader's behaviors are that of a moral person or ethical manager, the behavior may result in a positive or negative outcome. Walumbwa et al. (2017) noted that ethical leadership influences worker behaviors with positive reinforcement, open communication, and trust. Inceoghu et al. (2018) found that leaders' behaviors might positively or negatively influence employee behaviors. Improving health care workers' behaviors may improve their performance and reduce medical errors.

Leaders who provide open communication, reinforcement, and encouragement may influence their workers' attitudes, behaviors and which creates an environment that results in positive outcomes. Mahmood et al. (2017) noted that leadership behaviors influence health care workers' creativity and engagement. Using positive enforcement, health care leaders may influence health care workers' behaviors by leading by example. Leaders who praise and encourage may improve health care workers' performance by leading and improving the patients' safety and reducing medical errors. Khalili (2017) noted that leaders who positively influence and motivate their employees to improve performance and promote health care workers' behaviors resulting in a positive outcome. Health care leaders can increase their ability to influence health care workers' attitudes and behaviors through organizational development (Khalili, 2017). Hoch et al. (2018) noted the transformational leader may influence workers' behaviors by developing health care workers' self-confidence with positive reinforcement. Health care leaders promote self-development with guidance and encouragement.

Health care team members' attitudes and behaviors may influence the health care workers' performance for reducing medical errors and improving patient safety. Tabassi (2017) noted that team building and improving team communication may influence individuals' skills and competencies to achieve organizational goals. Eisenberg et al. (2019) studied the effectiveness of different leadership styles for leading a dispersed team of individuals and their performance (i.e., virtual teams). Team collaboration and communication are critical components for a successful virtual team. The leadership communication styles may positively or negatively influence the workers in a virtual

team based on the group dynamics (Eisenberg et al., 2019). Health care leaders can influence the team members' attitudes and behaviors to improve team collaboration and performance.

Ethical and Unethical Attitudes and Behaviors

Health care leaders' behaviors reflect both their ethical and unethical attitudes and behaviors toward health care workers. Health care leaders can demonstrate ethical behaviors by becoming trustworthy, honest, and fair (Egorov et al., 2020). Health care leaders' display of ethical behaviors may influence a reduction in medical errors because health care workers may use the leaders as role models and follow the behaviors demonstrated. Health care workers perceive ethical leadership behaviors in action when leaders demonstrated and interact with employees with mutual respect, two-way communication, and reinforcement (Paterson & Huang, 2019). When the relationship between health care leaders and health care workers is based on mutual respect, this may influence the teams' collaboration and communication, positively impacting the delivery of patient care.

The characteristic of the health care leaders is representative of ethical and unethical behaviors. Gan (2018) noted that ethical behaviors comprise two components: leaders either observing or demanding a level of behaviors from their workers. Ethical leadership fosters an environment that encourages work engagement, communication, and trust. A positive work environment may influence and motivate health care workers' behaviors (Engelbrecht et al., 2017). Leaders transform health care workers' ethical behavior by leading with integrity, having positive interactions with employees, and

clearly communicating. Leadership demonstrating poor or unethical behaviors may influence an increase in the number of workers' disciplinary actions and may influence an increase in medical error. The health care leaders' unethical behaviors may influence the work environment leading to unintentional medical error.

Unethical behaviors lead to mistrust, and poor communication may lead to workers exhibiting unacceptable behaviors and lead to an inefficient work environment. Health care workers can be accountable for unethical and unacceptable behaviors by health care leaders (Gan, 2018). Egorov et al. (2019) noted that aggressive and abusive behaviors exhibited by unethical leaders may influence health care workers negatively. Whether the leader demonstrates ethical or unethical behaviors, health care workers' perceptions of those behaviors may influence their behaviors. Ethical behavior encourages and motivates a positive work environment, open communication, engagement, and trust between the leaders and workers, while unethical behaviors are unacceptable and may lead to disciplinary actions.

Social Learning Theory

Health care workers learn both ethical and unethical behaviors by observing role models such as parents, teachers, or leaders. Horsburgh and Ippolito (2018) found that individuals will act according to the behaviors of someone they admire and identify with. Bai, Y. & Liu, J.T. (2017) noted that a leader might establish certain behaviors in workers**,** including the moral person and the moral managers. The moral person demonstrates the understanding of acceptable and unacceptable behaviors by observing and learning the appropriate behaviors (Horsburgh & Ippolito, 2018). Moral managers

will communicate the expected behaviors through rewards and sanctions (Bai, Y. & Liu, J.T., 2017). Individuals learn to develop new behaviors by observing, training, and imitating role models (Horsburgh & Ippolito, 2018).

Health care workers' behaviors may improve with social learnings skills learned by using role modeling, observation learning, and communication styles. Bandura's (1977, as cited by Horsburgh & Ippolito, 2018) social learning theory is based on two elements that include observation and role modeling. Health care workers may learn new behaviors by observing a leader with authority, and these observations may lead the worker to exhibit similar behaviors. Deeming and Johnson (2019) suggested that Bandura's social learning theory can influence observational learning on communication styles that may influence a miscommunication between health care workers resulting in a medical error. Whether communicating face-to-face or virtually, individuals are adapting to virtual communities and learning lawful or criminal behaviors. Miller and Morris (2016) noted that social learning may influence the interaction between health care leaders and workers because peers who work and communicate in the virtual community may improve the health care workers performance, communication skills, and personal behaviors by observing and imitating role models.

DMAIC

One approach an organization can use to improve processes and reduce errors is the DMAIC method. This method can help health care leaders define the scope of the issues and goals, measures the outcome, analyzes the data, improves outcomes, and controls outcomes by continuously improving the process (Tettey et al., 2016). The

DMAIC process is used to identify and improve upon existing processes (Alnadi & McLaughlin, 2020). The DMAIC provides users with information in developing new processes to improve the root cause of the problem. The DMAIC method may help health care leaders develop new strategies for reducing medical errors.

The DMAIC method is a business strategy used by organizations to improve processes, measure outcomes, identify quality indicators, provide accountability, and minimize the variability in the data. Hospital leaders may use this process to improve performance by employing a quality matrix to reduce medical errors and increase profitability. Alnadi and McLaughlin (2020) noted that the DMAIC process improves the quality matrix indicators, increases profitability, and reduces time and cost. Leaphart et al. (2012) reported that process improvement tools assist with problem-solving and identifying solutions to improve care quality and reduce medical errors.

Improving the delivery of patient care is a complex process that requires health care leaders to develop new strategies to improve workers' performance. The DMAIC process provides a road map for developing and defining new strategies for strengthening worker attitudes and behaviors to reduce medical errors. The DMAIC process involves using diagrams, flowcharts, and tables to analyze collected data and to validate the effectiveness and efficiency of the quality improvement (Tettey et al., 2016). I used a combination of the TL and DMAIC process to develop new initiatives that may influence the leaders' ability to transform the health care workers' behaviors using the data collected on reducing medical errors.

Define

During the defined phase of the DMAIC process, the project team identifies the objectives for resolving the issues for reducing medical errors. The team identifies the scope of the project, its target goals, the team charter, and the timeline for achieving the goal of reducing medical errors (Tettey et al., 2016). The project team also establishes both the metrics for reducing medical errors and the data collection methods for measuring and analyzing the metrics (Chiarini & Bracci, 2013). During the defining phase, the team also identifies the steps needed to achieve the project outcome, measures the accuracy of the validity of the data, and analyzes and correlates data. During this phase, the information gathered can provide hospital leaders with guidance for developing new strategies to reduce medical errors.

Measure

In the next phase, the project team will analyze and measure the collected data on quality improvement processes used for reducing medical errors and validity of the information by analyzing the data for accuracy. The team evaluates and analyzes the data to ensure the validity of the input and output variables (Improta et al., 2019). During this phase, the team identifies the criteria and evaluates the metrics use to validate the data to improve the reduction of medical errors (Sunder & Kunnath, 2019). In addition to measuring the data, I analyzed the data for validity and reliability.

Analyze

The data collected in the analysis phase provides the project team with the information needed to assess the validity and reliability of the quality improvement

process in reducing medical errors. Cause-and-effect diagrams, flowcharts, and tables are resource tools the project team uses to analyze the data collected in the improvement process. During the analyze phase, the project team uses a variation of a resource model to interpret the data and to identify gaps in the data collection process (Nedra & Nejib, 2019). By using a cause-and-effect diagram, the team may be able to identify the relationship between the potential causes and the possible outcome for each event (Kuwaiti & Subbarrayalu, 2016). The health care leaders use the data collected to assess, reassess, and adjust the process to ensure a continuous quality improvement process.

Improve

Health care leaders may transform and improve health care workers' attitudes and behaviors in reducing medical errors using the analyzed data. In the improvement phase, the team evaluates, monitors, and reassesses poor outcomes that may have led to a medical error and identifies gaps in the process (Improta et al., 2017). Conducting a root cause analysis may help the health care leaders identify gaps in the metrics and realign processes to reduce medical errors (Kuwaiti & Subbarayalu, 2016). The improvement phase influences the health care leaders to investigate and realign the health care workers' practices and to improve their attitudes and behaviors to reduce medical errors. Health care leaders may review and redefine the measurement to improve the process for reducing medical errors.

Control

In the control phase, the project team monitors and assesses the data input and output enabling the team to reevaluate and adjust the plan for reducing the number of

medical errors. The team controls the output process by evaluating the data and adjusting the plan to improve the processes for reducing medical errors continually (Improta et al., 2019). During the control phase, the team monitors the progress of the improvement plan, conducts debriefings on the outcomes, and develops action plans to improve the process for reducing medical errors (Kuwaiti & Subbarayalu, 2016). The team controls the data by continually developing the plan to achieve a successful outcome.

I selected the DMAIC process in combination with TL for this study to transform health care workers' attitudes and behavior using the algorithm diagram to guide the health care workers to implementation of the developed procedures for reducing medical errors. The five phases of the DMAIC process may help the project team define the problem and identify the causes and effects that may influence changes in practice and procedures to prevent a medical error. Along with the DMAIC process, I used the TL theory to influence health care workers, acceptance, and adoption of the improvement processes necessary for reducing medical errors.

Team Communication Strategies

Team communication is an essential component for providing quality patient care in a multidisciplinary team environment to minimize the risk of medical errors. Communication refers to the sharing of information that is clear, concise, and timely to promote a shared mental model (Brindley & Reynolds, 2011; Richardson, 2014). In addition to developing team communication and collaboration, characteristics such as shared knowledge, skills, attitudes, and competence improve health care workers' safety behaviors (Sierpina & Kreitzer, 2014). Improving teams' communication and

collaboration may improve patients' access to care and their safety (Brock et al., 2013). The focus of the relationships within multidisciplinary teams is team communication and collaboration that positively improve the safety climate and reduce medical errors.

Tools for Communication

Improved communication is essential to patient care delivery and safety, and providers can achieve this through specific methods that includes SBAR, close-loop communication, and read-back. Different methods of communication in the health care environment may include providers' communication hands-offs, such as debrief verbal telephone orders, documenting patients' condition in medical records, or conveying urgent messages. Miscommunication or inaccurate communication disseminated to health care workers may negatively influence the delivery of patient care and may cause patient harm. To avoid miscommunication, health care workers may use the repeat-back/read-back method to ensure the receiver accurately receives an order. Health care workers can use the SBAR tool to send clear and concise information urgently to team members (Richardson, 2014). Health care workers may use communication such as, SBAR and repeat back/read-back to disseminate critical information to improve patient care and reduce medical errors.

Team communication is a critical component in providing quality patient care. Health care workers may use different communication styles, such as the SBAR method to inform team members of the current patient conditions during shift changes and break periods to provide quality care. In some cases, the health care leaders may use the SBAR method to convey clear and concise messages that may involve urgent situations that are

clear and concise (Stewart & Hand, 2017). In conveying critical information, the health care workers may also use the read-back method to avoid medical errors by ensuring the receiver received the message accurately. The read-back method conveys to critical message to health care workers (Boyd et al., 2014). Whether the communication is taking place in a non-emergency or emergency, health care workers may use these standardized tools to provide quality patient care and reduce medical errors.

The SBAR Method

Communication between the members of a multidisciplinary team is an essential component for providing quality care. The SBAR technique enables workers to convey critical information clearly and concisely using a standardized communication process (Stewart & Hand, 2017) clearly and concisely. The SBAR technique improves team communication and collaboration, increasing the health care workers' awareness of the patient's care or surroundings. Health care workers learn to use the SBAR technique by participating in simulated training and ongoing experience with conveying critical information. Herawati (2017) noted the SBAR communication method allows the health care workers to provide a brief description on patient's care plan during the change of shift. The SBAR technique includes a brief description of the situation, background of the problem, an assessment of the situation, and a recommendation to resolve the problem, which is used to influence a positive outcome, and reduce errors (Uhm et al., 2019). Keston (2011) indicated that the SBAR technique improves communication between the multidisciplinary teams' members and improves patient safety. The SBAR tool is useful

for disseminating urgent information regarding patient care and safety issues rapidly to health care workers.

Close-Loop Communication

Another tool that health care workers use to address breakdowns in communication that may result in medical errors is the close-loop communication method. Close-loop communication is a critical component for communicating patient information to other health care providers. Health care providers use this form of communication for relaying physician orders, laboratory results, and medication orders to the other health care providers. Using the close-loop communication process, it provides the health care workers with the opportunity to ensure the patient is receiving the right order, right laboratory results, and right medication to mitigate the risk of patient harm and avoid a medical error. Close-loop communication comprises three components or steps to ensure health care workers clearly understand the situation: call out, check back, and close the loop (El-Shafy et al., 2017; Hargestam et al., 2013). In the first step, the sender calls out the order; Step 2, the sender checks back with the recipient to ensure the order was received; and Step 3, the sender verifies that the recipient clearly understood the message (El-Shafy et al., 2017; Hargestam et al., 2013). By using a close-loop communication method, health care workers can ensure the message is accurately conveyed, received, and interpreted by the recipient.

Read Back

Read back is another form of communication health care workers use to confirm a recipient receives and interprets a message correctly. The read-back method has a similar

process as the close-loop communication, with the health care provider reading-back or repeating the verbal communication to their colleague to ensure the message is clearly understood. Besides verbal communications, health care workers may spell out look-alike and sound-alike words to accurately document the correct orders. Health care workers use the read-back method to relay critical lab values, telephone orders, and medication orders to ensure the recipient received the information correctly (Boyd et al., 2014). Health care workers follow this process to ensure recipients receive messages correctly by asking the recipients to repeat messages (Barenfanger et al., 2004). Using the read-back method helps to ensure patients receive quality care and reduces the chance for medical errors to occur.

Speak Up

Another communication process health care workers use to avoid medical errors is to speak up if the recipient did not repeat the order accurately. The foundation of improving a health care team's interaction is communication. Without communication, the potential risk of injury to the patient increases. Whether the team member is a physician, nurse, or monitor tech, team members must learn how to communicate with others and speak up if they observed potential safety issues. Topazian et al. (2013) noted that speaking up alerts other team members that as a team member is concerned that a potential risk may occur, possibly causing patient harm. Best and Kim (2019) reported that the concerned, uncomfortable, safety (CUS) protocol a safety, tool developed in TeamSTEPP, allows health care workers to voice concerns during the delivery of patient care. Seale et al. (2015) suggested that health care workers provide patients with

education and encouragement to participate in their care actively. Law and Chan (2015) recommended that health care workers gain experience with speaking up and communicating with team members. Improving team communication and allowing the patient to participate in the health care process may reduce the patient's potential risk of injury, thereby reducing medical errors.

Improving the tools and resources that health care workers use may allow them workers to overcome communication gaps within the team environment. Best and Kim (2019) noted that coaching, the ongoing sustainability of training sessions, and verbal skill training sessions might improve speaking up communications skills. Law and Chan (2015) stated the communication is an essential component for providing quality care and protecting the patient's safety. Salazar et al. (2014) reported that communication errors might occur between health care workers' hierarchy with potential risks to the patient's safety. Health care workers speak up to voice their concerns over issues that may influence patient safety and mitigate risk to the health care organization. Morrow et al. (2016) noted medical errors occur when health care workers fail to speak up and voice concerns during the delivery of patient care. Without the ability to speak up, preventative errors may influence patient harm. Salazar et al. (2014) found that clear communication is a critical component in preventing a medical error from occurring. The health care nurse educators may educate the multidisciplinary team of providers to communicate and speak up when critical safety issues may reduce medical errors. Providing the resources and tools that enable health care workers to speak up may prevent medical errors.

Team Collaboration Strategies

Team collaboration values include team communication skills, respect, and a shared mental model for providing quality care and reducing the risk of medical errors. Hashemi et al. (2012) identified poor working conditions and deficiencies in the safety culture as factors that influence patient care, leading to patient harm. Health care workers' poor team collaborations affect the teammates' attitudes, behaviors, and values, which may lead to distrust, decreased communication, and increased medical errors. Reime et al. (2016) indicated effective interprofessional collaboration enhances patient care delivery and may reduce medical errors.

Increased collaboration in the interdisciplinary team improves communication, situational awareness, and mutual support, all of which may reduce medical errors. For this study, I selected and researched the following team collaboration models that may influence the health care workers attitudes and behaviors: TeamSTEPPS, shared mental model, and Hill's model for team leadership and effectiveness in a team environment. Using the TeamSTEPPS model, health care workers receive training to improve team communication and collaboration by learning to speak up using the SBAR, two-challenge rule, and the CUS methods. The shared mental model and Hill's team leadership model are similar in that they out the roles and responsibilities of both health leaders and health care workers.

TeamSTEPPS

Providing patient care without errors is a challenging task for health care leaders to resolve without the health care workers' mutual support for improving the culture of

safety in reducing medical errors. The TeamSTEPPS model was developed and implemented in 2003 by the Department of Defense and the Agency for Health Research and Quality to improve team communication and collaboration to improve health care workers' performance. The World Health Organization (as cited in Lawati et al., 2018) defined patient safety as providing patient care without a medical error. Researchers at the Institute of Medicine (IOM; 2000, p. 28, as cited in Ulrich, 2014) in 1999 estimated that 1 million injuries and 98,000 deaths resulted from human error. The critical component identified in the IOM report is patient safety, and researchers have found health care workers' attitudes, values, and beliefs influence patient safety**.** The TeamSTEPPS model is used to train health care workers to work together effectively and efficiently in a positive manner. Lisbon et al. (2016) noted that monitoring and tracking the health care workers' training with using the TeamSTEPPS resources may improve health care workers' attitudes and behaviors for 45 to 90 days. This may help health care leaders identify gaps, provide coaching, and reinforce the TeamSTEPPS training to improve patient care. However, in high volume areas, the health care workers need to adjust and identify gaps using the TeamSTEPPS training and resources to improve the delivery of patient care.

TeamSTEPPS is a combination of different methods and resources that health care workers may use to improve patient safety and reduce medical errors. The four core concepts of TeamSTEPPS are leadership, communication, situational monitoring, and mutual support. In a team environment, the leader guides the team members in delivering patient care to ensure the patient is receiving the appropriate care treatment plan (Karlsen

et al., 2020). The health care leader or worker will communicate with the team members by using some of the standardized tools that include the SBAR communication tool, CUS, two-challenge rule, and speak up. The communication tools used in the TeamSTEPPS method may improve the health care workers' collaboration. Developing communication skills may also influence the health care workers to speak up or use the CUS method to call attention to risk concerns that may cause patient harm (Umoren et al., 2018). In addition, health care workers may use the communication to report any risk concerns when monitoring the environment.

Leadership

Providing treatment and care to patients requires a team of health care workers who will initiate and execute a patient care plan. To avoid duplication with the care plan execution, a leader will oversee the health care workers' activities to ensure the patient care plans to initiate and guide the team during an emergency (Karlsen et al., 2020). Whether the patient is receiving emergency or routine care, the leader guides the team to ensure the patient receives the right treatment and right medication. In an emergency, the leader assesses the environment for risk, communicates orders, and supports team members to avoid duplicate command and confusion in providing patient care. Effective communication that is used by health care leaders and workers improves the delivery care of patients to ensure the patient receives the appropriate care.

Communication

Team communication is one key element used in the TeamSTEPPS model to provide accurate and vital information between health care workers. Resource tools used

in the TeamSTEPPS model are SBAR, callouts, CUS, check-backs, and hand-off communication (Umoren et al., 2018). Each type of communication conveys a different type of urgency for communicating vital information to a team of health care workers. Using these forms of communication, the health care worker relays a summary of the issue that is clear and concise. Using the SBAR, the health care worker conveys the information by summarizing the current situation, background of the event, analysis, and any recommendations that needs to be addressed (Blom et al., 2015). The health care system is a complex environment requiring health care workers to communicate efficiently and effectively to improve patient safety and provide quality care (Obenrader et al., 2018). Team communication is a crucial component for improving the safety of patient care in reducing medical errors. TeamSTEPPS is a team collaboration involving teamwork, leadership, situational awareness, and mutual support and requires members to work together to achieve success in providing quality care, improving patient safety, and reducing medical errors.

Situational Awareness and Mutual Support

The health care system is a complex environment which may influence the patient's safety and quality of patient care. Situational awareness is the process for continuously assessing the areas for risk that may impact the patient's safety and support the other team members (Karlsen et al., 2020). To mitigate risk and avoid medical errors, health care workers should continuously assess the environment for issues that may impact patient safety, such as broken equipment, spills, and trip hazards. Health care

workers may use various forms of communication to call out any patient safety issues or risks.

Health care workers use the mutual support method to help each other by providing positive reinforcement for improving team processes and outcomes. Additionally, health care leaders may use positive reinforcement to commend the health care workers for following procedures for providing patient care. In addition, mutual support may improve the health care workers' situational awareness for reporting environmental issues and mitigating risks that may lead to a medical error.

CUS and Two-Challenge Rule

Health care workers use the CUS method to voice concerns over patient safety and the delivery of patient care. These methods allow a health care worker to escalate and voice any safety issue affecting patient care (Clapper, 2018). Health care workers use the CUS method to discuss the safety concern constructively and openly. The two-challenge rule expands on the CUS method by allowing a second health care worker to interject and stop the delivery of patient care to ensure patient safety. The health care workers may use the CUS and two-challenge rule to prevent a medical error by constructively expressing concerns to other team members who may not be adhering to procedure protocols. For example, the health care may challenge the surgical team to call out the procedure name or the site of location. Failure to call out the procedure and identify the correct location of the procedure may lead to a medical error. Besides using TeamSTEPPS to improve team communication and collaborations, health care leaders may implement the shared mental model to improve the health care workers' attitudes and behaviors.

Shared Mental Model

Working in a face-to-face, remote, or cross-sectional team environment requires teamwork and shared understanding and dedication for providing quality care and reducing medical errors. In a shared mental model, the health care workers work together to achieve a common goal for reducing medical errors. Team members using the shared mental models share an understanding of the processes and procedures for providing quality care and achieve a common goal for patient safety (Hanna & Richards, 2018). In a shared mental model, health care workers (HCWs) may achieve a common goal for reducing medical errors by providing consistent processes and practice throughout the health care facility. For example, a shared mental model may involve developing protocols and processes that health care workers may use to avoid confusion and reduce medical errors. Beck et al. (2019) and Salas (2005) noted that improved teamwork requires five key elements: (a) leadership, (b) mutual performance monitoring, (c) backup behavior, (d) adaptability, and (f) team orientation. In the leadership role, health care leaders ensure the team is following the roles and responsibilities while adhering to the protocols and processes developed by health care leaders. The health care leader may use positive reinforcement methods to develop and improve the health care workers' behavior that may influence a reduction in medical error. Health care workers must learn to adapt to changes in the virtual environment using the shared mental model core elements (Schmidtke & Cummings, 2017). Adapting to changes in the health care industry, team members must trust and respect each other in a shared mental model (McComb et al., 2017). The shared mental model core elements improve the health care

workers performance in a face-to-face and virtual team environment. Improved teamwork, mutual performance monitoring, and communication builds confidence and trust among health care workers.

Components of Shared Mental Model

The shared mental models' critical elements improve teams' collaborations, coordination of care, and teamwork. The primary care physician in charge leads the care team by providing and coordinating the patient care to ensure the patient receives quality care and reduces the risk of medical errors. Redlich et al. (2017) noted that the shared mental model comprises four categories: shared knowledge, task-oriented, shared knowledge related to teams' activities, and appropriate team coordination. The primary care physician ensures the health care team understands the team's goal and shares knowledge of the patient care plan. Page et al. (2016) noted that the shared mental model consists of three primary functions: accurate coordination in administering patient care, shared awareness, and understanding of each other's roles and responsibilities. The coordination and administrating of the patients' care plan involves a multidisciplinary team of providers that understand their roles and responsibilities for the delivery of care. The multidisciplinary team of providers share knowledge related to patients' care plan to coordinate the delivery a patient care to improve a reduction of medical errors. The behaviors include team orientation, communication, trust, monitoring, and adaptability that may improve care coordination, therefore improving the quality of care and reducing the risk of medical errors. Johnsen et al. (2017) further developed the model by including the teams' behaviors that may influence the team's performance. The components of the

shared mental models improve team communication and collaboration by coordinating the health care workers roles and responsibilities.

Team communication and collaboration are critical to improving teamwork that may reduce medical errors and improve patient safety. Health care leaders may use the shared mental model and the TeamSTEPPS model to develop the health care workers' team performance by improving team communication and collaboration (McComb et al., 2017). The health care leaders may use these programs to train and improve team collaboration by improving the health care workers' trust and developing the worker's communication skills (McComb et al., 2017). Improving the teams' performance may include training the multidisciplinary group of providers that provide patient care directly or indirectly. In previous research, the team environment focused on a specific scope of practice and a distinct group of providers. Further research is needed to study the team environment by expanding the multidisciplinary group of providers beyond the scope of practice (McComb et al., 2017). Improving team communication and collaboration may reduce the occurrence of medical errors and improve the health care workers' situational awareness in identifying potential risk in the environment.

Shared leadership and followers may modify roles and responsibilities during an emergent situation calling out concerns or orders to anticipate and predict team member's needs to reduce medical errors. In a shared leadership model, the health care workers may focus on a single leader or group of leaders that may lead the team in an emergent situation to reduce the risk of a medical error (McIntyre & Foti, 2013). The influence of shared leadership may improve the interaction between group members that may improve

patient safety and reduce medical errors. Health care workers working under the guidance of shared leadership have a mutual understanding and knowledge of the components of the team environment (McIntyre & Foti, 2013). In a shared mental model, the health care workers have a shared understanding of their roles and responsibilities in a team environment to improve the patients' safety and reduce medical errors.

Face-to-Face and Virtual Environment

Virtual team environments allow health care workers to connect and interact across a demographic area without the travel time. Interacting in a virtual team environment enables the health care workers to communicate, discuss, and coordinate patient care. The use of a virtual environment provides health care workers with the ability to conduct team meetings, training sessions, interviews, and private in-person meetings across a demographic area without the travel time and conference room availability. Additionally, combining face-to-face and virtual meetings allows health care leaders to extend meeting invites to those participants unable to attend in person. Virtual team environments allow the health care workers the ability to connect either by joining by sharing audio or video virtual call. A virtual team environment allows health care leaders and workers to communicate and discuss urgent issues that may prevent an occurrence of a medical error. Whether meeting face-to-face or virtually, the members of the team collaborate on patient care or issue resolution using their knowledge, expertise, and skills to solve problems. Schmidtke and Cummings (2017) noted the dynamics of virtual team environments functions the same as face-to-face meetings; however, team members meet electronically to share information and knowledge. Alsharo et al. (2017)

noted that members lack trust because of the inability to observe the health care workers' behaviors. The virtual and face-to-face team environment operate and functions the same as in-person meetings with some differences. Another team leadership that I will review is Hill's team leadership model.

Team Leadership Model

The team's success and efficiency depend on the leader's abilities to guide the health care workers toward one shared vision. Developing and leading a successful organization teams' model may influence team effectiveness and efficiency (Petkovski & Joshevska, 2014). Health care leaders influence the health care workers with positive reinforcement and training sessions to ensure effectiveness and efficiency in developing team models. The training session may improve the interconnection with the multidisciplinary team activities to improve team communication and collaboration, which may reduce medical errors. A team consists of interdependent individuals coordinating activities to achieve a common goal (Hill, 2016). The team leader influences a successful team model to manage and lead internal and external team members (Petkovski & Joshevska, 2014). The team leader may manage and lead team members by assigning team roles and responsibilities based upon the developed team model. Hill's (2016) for team leadership breaks down the internal and external roles and the actions that the leaders monitor to achieve a thriving team environment. Hill's model for team leadership may assist health care leaders in developing tools and resources that health care may use to reduce medical errors.

Medical Errors

Medical errors can negatively affect the emotional well-being of health care workers and patients. Injuries caused by medical errors affect patients' ability to trust health care workers, but injuries may also cause health care workers to reexamine the steps taken that led to a medical error. Medical errors are unintended events that result in patient harm, including minor discomfort, inaccurate diagnosis, significant injury, or death (Bidzinska & Kolodynski, 2016). Medical errors cost the health care industry approximately $132 billion annually (Tzeng & Yin, 2015). Medical errors fit into the following categories: near misses, minor events, and errors causing serious patient harm or death (Okpoko et al., 2018). The failure to provide the appropriate care and treatment that results in patient harm is a medical error (McLean, 2015). Some causes of preventable medical errors include a failure to communicate clear and concise directives, wrong site surgery, inaccurate medical doses, environmental issues, and inadequate administration of physicians' orders and care plans (Hannawa, 2014). Inadequate competency and knowledge refer to health care workers' level of training and skill set for the work environment, specific to the job assignment, which may influence and contribute to medical errors (Koehn et al., 2016). Combining training and changes in the delivery of care may improve patient safety and reduce medical errors.

Communication and Diagnosis Error

Communication errors can occur during patient care delivery when health care workers misunderstand an order or directions provided by other members of a multidisciplinary team. Failures in communication may also occur during a procedure,

for example, by misinterpreting an X-ray or laboratory reports or by administrating an incorrect medication dosage that may lead to a medical error (Zineldin et al., 2014). Other forms of errors can occur when health care workers are unable to distinguish between look-alike or sound-alike medications. Williams et al. (2014) reported that errors might also occur during a communication hand-off between health care providers. Miscommunication or delays in communicating patients' medical information may lead to inappropriate treatment plans and, therefore, medical errors. Ineffective communication and insufficient knowledge can influence patient safety and the delivery of care, resulting in medical errors (Khammarnia et al., 2015). During patient care delivery, improved team communication is essential for reducing medical errors and providing quality care.

Reporting and Disclosing Medical Errors

Some health care workers lack the tools and training needed to disclose and communicate medical errors to patients and their families (Bari et al., 2016). Changing the culture of blame to identifying system issues will enable the health care leader to improve patient safety and reduce medical errors. Improving the culture can include providing health care providers with the skills to discuss and disclose medical errors to the patient and patient's family. Lawmakers passed the Patient Safety and Quality Improvement in 2005 to improve patient safety by encouraging health care organizations to recognize and analyze data and trends resulting in medical errors (Koehn et al., 2016). Improving the health care workers ability to communicate with the patient and patient's family may restore the patient's trust and improve the emotional well-being of the health

care provider and patient and their understanding of the issues leading to the medical error. Health care leaders continuously develop and implement new performance improvement processes to improve care delivery, including training health care providers in addressing issues resulting in medical errors.

Medical errors that result in patient harm affect patients, patients' families, and health care providers. Medical errors that cause either minor or severe injuries may increase the length of stay and recovery time for patients, and in some cases, result in patients' death. In each case, health care providers will need to document the medical error and disclose the error to the patient. Health care workers should receive training on new and existing technologies that may affect patient care, such as annual competency training in procedures and protocols used in delivering care. Strategies for reducing medical errors include training and educating health care workers and delineating team members' roles, responsibilities, and accountability to increase patient care (Wyman, 2013). Failing to provide adequate patient care may result in administration errors, treatment delays, incorrect diagnoses, inaccurate test result interpretation, and inadequate medical treatment plans that result in patient injuries (Bari et al., 2016). Providing ongoing annual training and ensuring competency in processes and protocols improves the health care workers' ability to respond to system issues that result in a medical error.

Transition

In Section 1, the focus was on health care leaders' strategies for improving health care workers' commitment toward the culture of safety in reducing medical errors. The data collection process included seven open-ended and semistructured interview

questions. I analyze the responses to the interview questions, and the results may provide health care leaders with new strategies to reduce medical errors.

In Section 2, I restate my purpose statement and outline my decision process for selecting the research methodology and participants in this study. I describe my role as a researcher and how I collaborated with interviewees to gather data from the interview questions.

Section 2: The Project

In Section 1, I focused on different types of team collaboration and communication that may influence health care workers' attitudes and behaviors in the prevention of medical errors. This study was a qualitative single-case study at a hospital located in Southern California. The research question centered on leadership strategies for reducing medical errors. The literature review focused on the applicability of the TL theory in combination with the DMAIC process to efforts aimed at reducing medical errors.

Section 2 includes information on the role of the researcher, the data collection process, and the reliability and validity of the research. I discuss my role in interviewing participants and analyzing the interview data. I also discuss other aspects of the data collection process and the ethical procedures used for the study, including the means for securing and protecting the participants' identities. To protect the name of the hospital and the identities of the participants, I used pseudonyms. I used the interview protocol (see Appendix A) as a guide for the interview process and to avoid any bias. Before conducting interviews, I obtained the participants' consent. Each participant was provided with a summary of the research project and goals. The information collected will be stored in a secure location for 5 years. After 5 years, the information will be destroyed using a secure method.

The data analysis and collection process included conducting in-depth interviews, analyzing interview data, and storing the information. Six health care leaders were interviewed until data saturation was reached. I used open-ended interview questions to

collect the data. The interviews were conducted in a secure location that protected the participants' right to privacy. I coded the data to generate themes. I used member checking to verify the validity and reliability of the collected information.

Purpose Statement

The purpose of this qualitative single-case study was to explore strategies some health care leaders use to reduce medical errors to improve organizational profitability. The targeted population included six health care leaders located in Southern California who oversaw the operations of a single hospital and who have been successful in developing and implementing strategies to reduce medical errors. The implication for positive social change is the potential to improve patient safety and communities' trust.

Role of the Researcher

The researcher of a qualitative study is the primary data collection instrument in the study (Clark & Veale, 2018). The researcher is responsible for capturing the participants' thoughts, attitudes, perceptions, and beliefs about their experiences in research topics on medical errors (DeJonckheere & Vaughn, 2019). As the primary researcher, I recruited the participants, and I also collected, analyzed, and reported the data. In this qualitative study, I was responsible for the data collection that included data analysis, interpretation, transcription, and reviews of the reliability and validity of the data (see Sutton & Auston, 2015). In this role, I elicited the participants' understanding and their knowledge regarding the causes and influences of medical errors.

I have more than 14 years of experience as a project manager and a supervisor. As a project manager, I have assisted with regulatory events related to reporting any adverse

events and medical issues or errors. In my current role as an office supervisor, I support departments responsible for collecting quality data and metrics, monitoring corrective action plans, and coordinating training events to improve team collaboration. As a supervisor, I planned to interview health care leaders; however, I did not have any influence or control over those individuals. My current role is as a performance improvement consultant responsible for improvement processes that can improve patient safety and the delivery of care in reducing medical errors.

For this study, participants were identified as P2, P3, P4, P5, P6, and P7 to mitigate risk to the participants and the hospital. I worked with both the compliance and public affairs department of the facility, a hospital located in Southwest United States, to ensure the hospital could not be identify in this study. As the researcher, I have an affiliation with both the hospital study site and participants who are employees at the subject site. As the interviewer and researcher, I expected to potentially encounter bias when conducting the interviews. I strove to avoid making any statement that may have influenced interviewees' responses (see Chamberlain, 2016). I followed the interview protocol (see Appendix A) to mitigate any potential bias and avoid injecting any personal knowledge I had on the subject matter. In addition, I developed a checklist to help me recognize any bias that I may have had when conducting the interviews to avoid exerting any influence or perception on the study. As a result of these efforts, I did not encounter bias.

To further protect participants, I followed the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The U.S.

Department of Health and Human Services (2014) conducted a biomedical and behavioral study on human subjects to develop ethical guidelines to protect the rights of the human participants. In 1974, The National Research Act (Pub. L. 93-348) provided the four components necessary for an ethical study: (a) boundaries between practice and research; (b) basic ethical principles that include respect, beneficence, and justice; (c) participants' informed consent; and (d) a description of the risk and benefits. In my role as the researcher, I was responsible for adhering to and complying with *The Belmont Report*, the report authored by the Commission in conducting an ethical research project, by obtaining consent from the participants and answering any questions the participants may have had about the study objectives. Before beginning the interviews, I provided the participants with a summary of the research topic and project goals and had them complete a consent form to participate in the study.

For this qualitative case study, I used predetermined questions and asked clarifying questions. Using the interview protocol (see Appendix A), I followed the same steps for each interview for consistency to ensure each participant answered the same questions and to avoid bias. I asked additional probing questions to clarify the participants answers.

Participants

In this qualitative single-case study, I focused on identifying and exploring new strategies that health care leaders may use for reducing medical errors. The population consisted of six health care leaders located at a Southern California hospital. I purposefully selected health care leaders with 5 or more years of experience who were in

a leadership position, which included directors, medical center administrators, nursing leaders, operational leaders, and finance leaders. The selected participants had experience in addressing the causes and ramifications in dealing with medical errors. The participants recruited to participate in this study possessed the knowledge and experience for improving health care performance in reducing medical errors. The participants included in this study were administrators, directors, and managers who managed and led health care workers to adhere and comply with the rules and regulations in delivering quality patient care.

Research Method and Design

Research Method

The research method selected was the qualitative method. The qualitative method allowed me to understand the data collected to improve the health care worker's behaviors for reducing medical errors. The qualitative method was appropriate for this study because it allowed me to understand the thoughts and feelings related to the participants' experiences (see Sutton & Austin, 2015). The qualitative method focuses on the observation and understanding of the participants' lived experiences (Neubauer et al., 2019). Based on the information gathered by the researcher, the qualitative method provides an understanding of the participants' lived experiences through observations and the conceptualization of the abstracted knowledge (Bansal et al., 2018).

Because the focus of the current study was exploring leadership strategies for reducing medical errors that may improve organizational profitability, I used the qualitative method in gathering information on identifying the participants' behavior that

may influence medical errors. The qualitative method focused on the participants' responses to the interview question and learned observation from previous experiences. I collected and analyzed the data to identify a solution for identifying new medical errors (see Williams & Moser, 2019). Using the qualitative method, I collected and analyzed the participants' lived experiences to identify strategies for reducing medical errors that may increase organizational profitability.

The quantitative and mixed methods were not appropriate for this study because I did not focus on testing a hypothesis related to numbers or relationships between variables. The quantitative method was not appropriate because I was not testing a hypothesis or the relationship between variables for identifying new strategies for reducing medical errors at a signal hospital. The quantitative method focuses on achieving the exact measurement rather than collecting data based on the participants' lived experiences (Rutberg & Bouikidis, 2018). The mixed method of research combines two research methods to understand a single phenomenon and provides additional information to the collected data (Wisdom et al., 2012). The mixed method was not appropriate for the current study because I used research questions to collect data on a single phenomenon centralized in one location. Using the mixed method, the researcher combines qualitative and quantitative methods to fill gaps in the data that cannot be satisfied in stand-alone methods (Shorten & Smith, 2017). The quantitative and mixed-method approaches were not appropriate for my study because I did not test a hypothesis or examine the relationship between different variables.

Research Design

Researchers may use a signal case or multiple case study when conducting a qualitative study. Three qualitative designs were considered for this study including a case study, a narrative design, and phenomenology. I selected case study design for this qualitative study. Researchers use qualitative methodology to explore a phenomenon using multiple data sources in a specific context (Rashid et al., 2019). The case study design was selected because it allowed me to explore and investigate a phenomenon (see Heale & Twycross, 2018). I focused on new strategies for reducing medical errors that may increase organizational profitability. Using a case study design, I observed the participants' behaviors while conducting in-depth interview using open-ended questions. Researchers use the qualitative method to contribute to existing literature through observations, in-depth interviews, and documentation reviews (Galli et al., 2017). A case study design helps the researcher understand a phenomenon from data collected in-depth interviews (Hyett et al., 2017). I selected the case study design to understand the participants' strategies for reducing medical errors and increasing organizational profitability.

A researcher may use a single or multiple case study to conduct a qualitative study. The case studies allow the researcher to understand the data using multiple resources for understanding the phenomenon that includes in-depth interviews, observations, and documents. Researchers use case studies are used by researchers in academia to complete their dissertation in the business and management field of study (Lee & Saunders, 2017; Rashid et al., 2019). For example, in a qualitative case study, the

researcher collects the participants' life experiences using different data sources, including in-depth interviews, observations, and documentation (Gustafsson, 2017; Pyo et al., 2019). I selected the single-case study to understand a single phenomenon (see Heale & Twycross, 2018). Using the case study design allowed me to explore the participants' strategies for reducing medical errors.

I did not select the narrative design to investigate the leadership strategies for reducing medical errors. A narrative design focuses on one or two participants' stories (Blomberg & Welander, 2019), not the actions for achieving a reduction in medical errors. A narrative design is a form of storytelling in which the participants may discuss their experiences. The narrative design was not selected for my study because I studied the health care workers' actions for reducing errors, not their personal stories. I focused on studying health care leaders' actions for implementing new strategies for reducing medical errors and increasing organizational profitability.

The health care leader may use the phenomenology design by understanding and learning from health care workers experiences related to medical errors. A phenomenology study is defined as gathering the participants' lived experiences related to this study (Dahlberg & Berg, 2020). The phenomenology study focuses on the individuals' perspective and lived experiences (Neubauer et al., 2019). I did not select the phenomenology design for this study because I did not collect information from the health care workers' lived experiences that may have influenced the occurrence of medical errors. I focused on strategies that health care leaders have used to improve the health care workers' attitudes and behaviors.

Population and Sampling

Population

For this study, the participant was required to have experience and knowledge in developing new strategies that may help in reducing medical errors and increasing organizational profitability. A population comprises individuals who provide meaningful data and understanding regarding the phenomenon (Ngozwana, 2018). My target population included six health care leaders with 5 years or more of experience. The health care leaders had the understanding and knowledge needed to develop new strategies for reducing medical errors and avoid negative financial impacts that would influence the hospital's profits. The selection criteria for identifying the health care leaders included health care leaders who had experience and knowledge for developing new strategies for reducing medical errors and increasing organizational profitability.

The health care leaders in the study provided insight into developing new strategies and cost-effective methods for reducing medical errors. I asked questions about leaders' experiences with reducing medical errors. The participants provided insight into strategies that have worked but may not consistently practiced. Based on the participants' responses, I was able to answer the research question related to medical errors. Through my interviews with the health care leaders purposely selected, I gained insight into the research problem.

Sampling

The population sample for this study was identified and defined before I conducted the study. I used purposeful sampling for this study. The criteria used to

develop the sample population included two elements: (a) health care leaders working with the frontline staff, and (b) health care leaders who have succeeded in developing strategies for reducing medical errors and improving profitability. The population sampled for this study included health care leaders who could provide oversight on this study topic; they consisted of administrators, nursing leaders, and directors who oversee the hospital operations. The second criterion was that the leaders could describe strategies for reducing medical errors. I selected six leaders who met the criteria. In qualitative studies, researchers have identified that sample size correlates with data saturation being reached (Vasilelou et al., 2018). In this study, I continued to interview additional health care leaders until data saturation was reached and no additional themes were identified.

In this study, I conducted interviews using video conferencing via Microsoft Teams. I also conducted face-to-face interviews if the participants felt more comfortable with that approach. The interview setting was an area that provided the interviewer and interviewee with privacy and protected the confidentiality of the collected data.

Ethical Research

Researchers collect information from individuals that expand knowledge relevant to improving processes (Zhang & Liu, 2018). Expanding research knowledge is helpful but must conform to ethical guidelines to protect the participants from harm. Ethical issues arising from research studies involving human participants have raised concerns about protecting confidentiality and disclosing personal information. The baseline requirements for researchers in evaluating and protecting participants' privacy are three

ethical principles: respect, beneficence, and justice (Yip et al., 2021). I ensured I adhered to the three ethical principles.

Human participants are protected under the National Research Act (1974). The Department of Health, Education, and Welfare issued the Belmont Report (1979) to ensure that researchers adhere to the three ethical principles respect to patients, beneficence, and justice (Artal & Rubenfeld., 2017). I have completed the National Institute of Health course Protecting Human Research Participants to ensure that participants receive fair and ethical treatment and use ethical practices while conducting the interviews.

According to Yin (2018), the researcher must obtain informed consent from participants before collecting research materials. The informed consent form advises the participants about their rights and the facts relevant to the study that may influence their decision to participate (Zhang et al., 2018). Additionally, informed consent must include details on the participant's right to refuse to participate and their right to withdraw at any time (Yip et al., 2021). I emailed the participants an initial email requesting their participation in the research. The informed consent form included the study's purpose and participants rights relevant to participating in the study. The consent form included a statement that the participants would not receive any incentives or rewards for participating in this study, and that the participants may withdraw from the research study at any time. Before conducting the interview, I emailed the participants to ensure that they understood their role and the role of the researcher in the study. Also, I asked the participants if they had any additional questions or concerns before the start of the

interview. I obtained IRB approval, IRB number is 07-26-22-0271603, prior to conducting the research.

Measures to protect the participants' confidentiality included but not limited to, protecting their personal information, data collection, and data analysis. I used pseudonyms to protect the participants' identities during data collection and analysis. I will protect the collected information on an external drive in a locked and secure place for 5 years. Additionally, the research documents, which included transcripts, member checking summaries, recorded interviews, data collection, and analysis, and secure location for 5 years. After 5 years, I will destroy all relevant documents, video recordings, audio recordings, and other communication.

Data Collection Instruments

As the researcher, I was the primary instrument in this qualitative study. In a qualitative study, the researcher is the primary data instrument for collecting and analyzing data and should allow the participant to choose a convenient location for the interview (Clark & Vealé, 2018). The qualitative researcher is the primary instrument in the research process for collecting, analyzing, and transcribing the information collected through interview and document reviews (Henderson, 2018). As the primary researcher, I conducted in-depth, face-to-face, semistructured interviews via videoconference with health care leaders to understand the strategies they have used to reduce medical errors. I asked the participants if they preferred face-to face or videoconference interview before conducting the interview.

Using open-ended questions allows the interviewer to expand the answers by asking additional questions (Doody & Noonan, 2013). Qualitative researchers use semistructured questions to conduct interviews to gather and capture the participants personal experiences, attitudes, perceptions, and beliefs (DeJonckheer & Vaughn, 2019). The researcher may choose one of three types of interviewing styles that includes structured, semistructured, and unstructured interview questions. In a structured interview, the participants are provided with the same set of initial questions and probing questions (Doody & Noonan, 2013). In my qualitative study, I used an interview protocol (see Appendix A). I started the interview with the participants using a set of predetermined open-ended interview questions (see Appendix B) and followed up with probing questions if needed for clarification of the interview questions. The interviews lasted for approximately 30 to 45 minutes and were conducted at a location and time that was convenient for the participants. During the interview, I asked open-ended questions to understand the participant success strategies they used in preventing medical errors. For this study, I conducted the semistructured interviews using a set of predetermined questions and followed up with probing questions to seek greater clarification.

As the primary researcher, I followed the interview protocol (see Appendix A) and conducted each interview using the same method for consistency and reliability throughout the process. Reliability of information is described as using the method for interviewing and data collection process (Andrade, 2018). After completing the interviews, I transcribed the interviews. I used member checking to summarize the meaning of each interview question and email the participants a copy of their

summarized interview to verify the reliability and validity of the information and the accuracy of the interview.

Data Collection Technique

I collected data by conducting in-depth interview using video conference that included semistructured questions, member checking, and supporting documentation such as a reference book. The data collection technique process began with collecting data using semistructured interview questions (see Appendix B). I asked additional probing questions to seek clarification. I collected the data by using an audio recording, notes, supporting documentation, and observation. Before each interview, I tested my video-conferencing application and audio recorder to avoid any equipment malfunction. To avoid any errors in the data collection process, I tested the audio recorder's dependability before the interview (see Easton, 2000). I took into consideration other advantages and disadvantages that may influence the interview process positively or negatively. Some advantages of using a form of video conferencing are convenience and increased usage of data devices with internet combability; however, internet access may also be a disadvantage with poor connectivity issues and background disruptions (Archibald et al., 2019; Gray et al., 2020). Also, I explored the advantages and disadvantages of conducting a face-to-face meeting. An advantage of conducting a face-to-face interview is that the researcher may use verbal and nonverbal aids to elicit responses from the participant whereas a disadvantage is the inability to gather individuals from different geographic location (Adhabi, 2017; Grey et al., 2020).

I validated the reliability of the collected data using member checking. Member checking is the process of providing a summary of their interpretations to the participant for accuracy and completeness (Rose & Johnson, 2020). This process provides the participant the opportunity to validate the researchers' findings. The participant may not recognize the perceived theme identified by the researcher (Rose &Johnson, 2020). In this case, I requested additional clarification to ensure the accuracy of the interpreted findings.

Another form of data collection process is the triangulation method. The triangulation method is used to collect data from multiple sources to strengthen this research study (Renz et al., 2018; Yu et al., 2014). Multiple sources the researcher may use are the following: documents, observation, field notes, questionnaires, and interviews (Renz et al., 2018). There are four types of triangulation methods, which include data triangulation, theoretical triangulation, researcher triangulation, and methodological triangulation (Abdalla, 2018). Data triangulations refers to the collection of data from multiple sources and different periods of time that improves the data descriptions of the phenomena (Abdalla, 2018). Theoretical triangulation allows the researcher to explore and interpret the data collection process using multiple approaches enabling to identify themes. Methodological triangulation is a process that researchers combine different methods for collecting data (Abdalla, 2018).

I began the data collection process by emailing and recruiting the health care leaders that I selected to participate in this research study. Next, I contacted the participants who accepted the invitation and set up an introductory meeting. I provided

the participants with a summary of the research and the purpose for conducting this interview via email. I also provided the participants with a participation letter. The interview session was set up in a quiet location to avoid interruptions that may influence the interview outcome. Easton (2000) noted the importance of the quiet location to avoid disruption with the audio recording sound or observing the interviewee's expressions during the interview. Using member checking, the transcriptions were validated to ensure participant's responses were transcribed accurately and not misinterpreted. Next, I provided each participant with a summary to ensure the documentation and data were captured accurately using member checking to verify and validate responses.

Data Organization Technique

In this study, the data organization techniques that I used to capture the data included an audio recording, taking notes, and collecting supporting documentations. The participants by assigning unique identifiers. I used a spreadsheet using Microsoft Excel to categorize the participant responses. I used codes and themes to identify the participants responses. The interview notes, supporting documentation, and recording will be secured in a locked cabinet and kept safe for 5 years. After 5 years, I will permanently delete the audio recorded interviews, destroy interview notes, and any supporting documentation.

Data Analysis

In this study, I explored strategies for reducing medical errors by collecting data by conducting semistructured interviews and member checking to the reliability of the information. The triangulation methodology was used in this research case study to strengthen the reliability and validity of the collected data (see Farquhar et al., 2020). The

qualitative data analysis software that I used in this study is NVIVO and excel Pivot table. The NVIVO software correlates the data using a coding process based on themes and categories (Hilal & Alabri 2013). I assigned codes to the data collected in the transcribed interview responses and documents to identify themes or categories. The qualitative data analysis system comprises of five different tasks with analyzing the data (Hilal & Alabri 2013). The five tasks include the following:

1. Manage data – organizes the data comprised of the interview transcript and documents
2. Manage ideas – understanding the generated issues
3. Query data – questions the data and allows the researcher to save the queries for further interrogation
4. Modeling visually – develops and create graphs to demonstrates the correlation be codes and themes
5. Reporting – formulates the results of the findings. (Hilal & Alabri 2013)

Reliability and Validity

Reliability

The researcher conducting a qualitative study uses different methods for verifying the reliability and validity of the research study. The researcher verifies the reliability and validity of the data collection process. The reliability in a qualitative research study is consistent (Leung, 2021). In using the interview protocol, the researcher shall ask the same interview questions consistently in the same order. Data saturation is recommended for qualitative studies and occurs when no additional information emerges from the

participants (Vasileiou et al., 2018). In addition to verifying the reliability and validity, the researcher may use the following measures: dependability, credibility, transferability, and confirmability methods.

Dependability

Dependability means the stability of data that may change depending on the conditions of the study (Connelly, 2016). Depending on participants' expertise and experience with reducing medical, the data would have similarities or changes. Cypress (2017) noted that two doctoral research students used this process to validate the themes and descriptors to validate the collected research data. Member-checking is a method used in qualitative study to validate the accuracy of the data. In addition to member checking, the researcher may use peer-debriefing. Peer-debriefing is also known as "analytic triangulation," using different validation methods to check verify the accuracy of the data (Hadi & Closs, 2016). Using peer-debriefing, I validated the data for consistency.

Validity

As a researcher, I verified and validated the participants' responses for consistency and accuracy. The validity of the research findings using a consistent process to validate data accuracy (Rose & Johnson, 2020). Researchers use member-checking as a requirement to validate participants responses as a requirement for qualitative studies (Motulsky, 2021). Member-checking used by researchers to ensure the interpretation of the data is accurate and credible.

Credibility

In this qualitative research study, the credibility is the consistency the researcher uses to interpret and validate the data. Credibility is defined by providing an accurate descriptive annotation of the participants' lived experience that is truthful (Cypress, 2017). Each participant was asked the same question for consistency and documented the participants' experiences of reducing medical error using member-checking for validation and accuracy interpreting the participants' responses. The study's credibility is the researcher's ability to demonstrate accuracy and confidence with the data (Connelly, 2016). Member checking is a form of trustworthiness to check the validity of the data collection process (Cypress, 2017). Trustworthiness refers to the researcher's confidence with the interpretation and quality of the study (Connelly, 2016).

Transferability

The interpretated data are considered transferable if the findings are useful and applicable to other settings. Transferability is defined as the ability to apply the researcher findings to different populations and environments that have similar issues to experience transferability (Abdalla, 2018). The transferability of data described as a thick detailed description and individuals can make informed decision that may apply to another context (Graneheim & Lundman, 2004, as cited in Houghton et al., 2012).

Confirmability

Confirmability is the process a researcher uses to maintain an audit trail to ensure the study validity (Cypress, 2017). As the researcher, I accurately documented the interview notes, documents, and member checking validation. Researchers use the

confirmability process to document, examine, and interpret the data collected from the interviewee responses (Cypress, 2017). In this study, I provided a detailed and accurate description of the interviewee knowledge, expertise, and experience until data saturation.

Transition and Summary

The purpose of this qualitative single-case study was to explore health care leadership strategies for reducing medical errors and increasing organizational profitability. In Section 2, I discussed the role of the researcher, participants selected for this study, the research method and design, population and sampling, the data collection technique, and organization. Additionally, reliability and validity of the data collected during the interview process using semistructured interview questions. Section 3 summarizes the study, the research findings, application of professional practice, the implication for social changes, and recommendations for further study. I conclude with a self-reflection of the experiences while conducting this research study.

Section 3: Application to Professional Practice and Implications for Change

Introduction

The purpose of this qualitative single-case study was to explore strategies health care leaders use to reduce medical errors to improve organizational profitability. The health care leaders who participated in this study had 5 years of leadership experience, which included the development and implementation of new strategies. I posed open ended questions to the participants during their semistructured interviews. Participants were interviewed using videoconferencing in a secure location of their choice to protect their privacy. The data collected from the participants' interviews were transcribed, validated using member checking, and analyzed to identify codes and themes.

In Section 3, I discuss the study findings as they apply to professional practice. In addition, I discuss how the study may influence and contribute to social change through improvements in quality care, the fostering of community trust, the reduction of medical errors, and increased profitability. I discuss the limitations of this study and how further research is needed to include other health care workers. By implementing the recommendations, health care leaders may be able to improve quality care and reduce medical errors. This section concludes with a self-reflection of my experience while conducting this study.

Presentation of the Findings

Theme 1: Team Communication

The first theme to emerge was team communication. Interview Questions 1, 3, 4, 5, and 6 corresponded to this theme. Two participants emphasized that communication is

a key component for disseminating information across multidisciplinary teams. The health care leaders emphasized several types of communication styles that both leaders and HCWs can use to help reduce medical errors that includes SBAR, speak-up, hand-off, and escalation process which aligns with the research study. Huddle is a form of communication leaders use to discuss daily activity with the HCWs. Daily activities include daily announcements and reminders.

Each participant emphasized that team communication is essential to reducing medical errors. P4 noted that daily situational awareness briefing (DSAB) is a form of communication the health care leaders use to communicate high level daily situations. The information provided in the DSAB includes staff ratios (red, yellow, green), work orders related to broken equipment, information related to product substitution or recalls, and other essential issues for the day. Communication provides a summary of the patient's care plan and activities improving patient care and a reduction in medical error. This form of communication provides the incoming shift a concise and summary of the patient's care plan and mental status. P2 and P3 emphasized that communication can be used to standardized processes to improve patient care and to reduce medical errors. P2, P3, P4, P5, and P7 emphasized the importance of speak -up communication for escalating any urgent patient safety issues to prevent and reduce medical errors. Health Care leaders encourages the HCWs to speak-up in a psychologically safe environment, as noted by P4 and P7. For instance, the physician is prepping the right shoulder and the consent form states left shoulder injury.

The literature reviewed in Section 2 aligns with the five themes the participants identified. The TeamSTEPPS model aligns the research study for improving team communication and collaboration by using the speak-up and hand-off communication tool to provide information between health care workers (see Umoren et al., 2018). Health care leaders use different forms of communication styles (see, Table 1).

Table 1

Team Communication From the Participant "Point of View"

Participant	Description	Count
P4	Daily briefing a high-level form of daily staffing ratio	1
P1	Escalation process related to not following procedures	1
P2, P3, and P4	Escalation process to report any patient safety concerns	3
P2, P3, and P4	Huddle with staff and provide feedback	3
P4 and P7	Psychologically safe to speak up to report errors	2
P4 and P7	Speak up culture: It allows staff to report errors	2
P 5	Speak up culture: It allows staff to voice concerns and feel supported	1
P3	Speak up culture: It allows staff to voice concerns and opportunities for improvement	1
P 5	Debrief	
P6	Willingness to speak talk about the error	1

Theme 2: Team Collaboration

The second theme to emerge was team collaboration. All participants emphasized the importance of team collaboration. Each participant described different forms of team collaboration. Daily huddles, daily rounding with staff, peer to peer conversation with leadership improves team collaboration with HCWs feeling acknowledged in daily operation. The health care leaders participate in DSAB, which is a daily briefing to report

out the unit daily census, 1:1 sitter, security holds, facility work orders and/or clinical equipment breakdown. Daily rounding consists of rounds conducted by a multidisciplinary team who rounds to assess the unit for coverage and broken equipment. Also, the rounding team assesses the unit for environmental issues that may influence the occurrence of medical errors leading to patient harm.

Health care leaders transformed the attitudes and behaviors of HCW by helping them understand the data and background of the problem. P2, P4, P5, and P6 (see Table 1) concurred that one of the key barriers for transforming the HCWs behaviors is attitude. P2 and P4 noted that transforming the HCWs behaviors can be accomplished by explaining the reason for change and ensuring the HCWs understand why the change is needed. Leadership providing consistency with daily activities such as rounding and daily huddles. P4 stated that helping the HCWs understand by providing evidence to demonstrate the changes improves the patient's safety and protects HCWs from causing harm.

P3 and P4 noted that rounding with HCWs improves team communication and collaboration with health care leaders. Rounding helps the health care leader identify any gaps with following policies and procedures. Health care leaders use rounding as a method to reeducate and coach HCWs when gaps are identified. This method allows HCWs to speak up and relay any patient safety concern related to patient care. Table 2 shows team collaboration from the participants' point of view.

Table 2

Team Collaboration From the Participant "Point of View"

Participants	Description	Count
P5	Collaborate with MD for Inservice to teach operational techniques	1
P5	Communicate with your peer groups and department leader in cross -collaboration between leadership and staff	1
P4 and P7	Creating an environment that is psychologically safe	2
P5	Involve communicating with key stakeholders to rescheduling cases during staff shortages	1
P5	Rounding with staff and be visible and available to staff	1
P4 and P7	Rounding with staff and listen to their concerns	2
P6	Rounding with staff and observing staff	1
P2, P4, P5, and P6	Help the staff understand the "Why" and background of the problem to improve attitude	4

Theme 3: Coaching, Education and Training

The third theme to emerge was coaching, education, and training. The health care leaders emphasized that the HCWs workers all receive annual education by completing assigned electronic training modules, annual competencies, and training on all new equipment and /or medication administration. The HCWs competencies were validated by a nurse educator to ensure the HCWs understood the training. The information drawn from Questions 1, 3, 4, and 5 (see Table 3). The participants emphasized that HCWs receive annual education and training to maintain competency on using equipment, medication administrations protocols, and basic practices related to current job duties. P2 and P4 noted that HCWs were trained and reeducated using policy to ensure they are following the correct procedures. P2 and P4 re-educated and trained a group of individuals during a huddle to ensure HCWs are following the same procedure and to

avoid a medical error from occurring. P3 used coaching, education, and training to improve the delivery of patients in the unit. P2, P3, and P4 indicated that rounding with staff in the units promotes real time education, validates that process and protocols are in place, and improves patient safety.

Table 3

Coaching, Education, and Training From the Participant "Point of View"

Participant	Description	Count
P2	Policies and procedures to help guide us in following procedures	1
P4	Policies and procedures for standardization in practice	1
P4	Educate staff on new processes	1
P4	Communicating and educating in small groups. Build trust	1
P5	Policies and procedures by training HCWs on new processes	1
P5	annual competencies	1
P6	Developing staff with best practices	

Theme 4: Performance Improvement

The fourth theme to emerge was using data to define problems and identify gaps in processes. Thematic analysis of performance improvement themes aligns with the DMAIC process. Health care leaders define the problem and use collected data to measure and analyze any identified gaps in the process. P2 (see Table 4) used data to identify gaps whereas P3 used the data to identify best practices. P 4 used the measure of success to build metrics. P7 used the data to track and trend medical errors and intervention. P5 used data to identify problems and improve team efficiency. P 4 and P6 used data to track and trend medication barcode overrides and discrepancy reports to

prevent and reduce medication error. Health care leaders use data for (a) identifying problems and processes, (b) tracking and trending medical errors, and (c)medication discrepancies and tracking and trending data to help prevent and reduce medical errors.

Table 4

Performance Improvement From the Participant "Point of View"

Participant	Performance improvement	Count
P2	Review data to identify gaps	1
P3	Continuously monitor and follow-up to identify any gaps	1
P3	identify best practice and implement	1
P4	Measure of success to build data metrics to monitor; track and trend, build metrics	1
P5	Identify opportunity for improvements by defining a problem and developing a SMART goal	1
P6	Review reports and identify gaps in workflow or procedures	1
P7	Team collaboration multidisciplinary team to define the problem	
P7	Data is used to identify medical errors and any interventions that we are tracking and trending	1

Theme 5: Leadership

The fifth theme was the health care leadership style. The leadership styles that emerged in this study are transformational and the shared mental model aligns with the findings in the literature review. P2, P3, P4, and P5 used data to influence the HCWs attitudes and behaviors. To overcome barriers and HCWs resistance to change, the healthcare leaders use persuasion by helping HCWs understand and explain the patient safety component. P2, P3, and P4 used the process measure and data to influence the

HCWs attitudes and behaviors by showing a comparison to the other hospitals or units in the hospital. P2 and P4 noted that using peer-to-peer pressure promotes changes in the HCWs behaviors. P7 used the peer-review process to assess the providers competency and behaviors. P4 and P7 noted that medical providers and HCWs can report potential errors confidently to reduce medical errors. This method leads to health care leaders identify gaps in process and protocols. Table 5 shows leadership from the participants' point of view.

Table 5

Leadership From the Participant "Point of View"

Participant	Leadership	Count
P2	Promote standardization across the units	1
P2	Shared mental model	1
P4	Working with staff to achieve the same goal	1
P4	Influence changes by reinforcing behaviors with huddling, consistency, and feedback	1
P5	Rounding with staff and being visible and present	1
P5	Huddle with staff	1
P6	Rounding with staff to promote awareness	1
P 7	Transparent with about the occurrence of medical errors	1

Applications to Professional Practice

Health care leaders can identify and implement best practices to reduce medical errors. The significance of this study can contribute to the reduction of medical errors, improve the quality of care, and improve health care workers behaviors and attitudes. The

interviews were conducted via video conferencing in a secure location and to protect the participant during the COVID-19 pandemic.

The health care leaders selected for this study responded to the semistructured interview questions differently; however, the themes were similar. The themes and phrases that evolved included collaboration, communication, performance improvement, education and training, and leadership. The participants emphasized the importance of team communication and collaboration to improve the quality of care. Provide support and ongoing education to ensure health care workers receive training and are competent to use medical equipment appropriately and accurately. This includes retraining and reeducation of the health care workers with changes mandated by the protocols set forth by the policy and procedures, ensuring health care workers feel safe to speak up to escalate any safety concerns that could increase the risk of patient harm.

Implications for Social Change

The implication for positive social changes includes strategies to improve health care workers' attitudes and behaviors that will reduce medical errors. Health care leaders implemented processes consisting of unit huddles, rounding on the unit, and one-to-one coaching health care workers. Community members could benefit from the health care workers' improved team communication and collaboration, which may reduce medical errors and improve the quality of care. This improvement process could contribute to a higher level of quality care, a reduction in medical errors, and increased community trust.

Recommendations for Action

Health care technology evolving constantly in the delivery of patient care. As new products, medication, and treatments emerge, health care leaders need to adapt to the changes. Prior to introducing new products and changes to protocols, health care leaders need to research the cost and benefits of each product and process. Health care leaders should include key stakeholders that may include frontline staff in the decision-making process so they could provide feedback with implementing changes. Before implementing the new product or process, developed a policy and procedure to ensure that HCWs follow the correct protocols that includes the risk and benefits to reduce medical errors from occurring. To ensure HCWs are aware, the changes communicated and HCWs educated and trained to use the new product.

Health care leaders need to establish a process to ensure that HCWs impacted by the changes are educated and trained. This method may include involving key stakeholders, such as nursing leaders and frontline staff who will be using the products. To implement changes, it is important to communicate and socialize the changes to the HCWs so that staff are aware of the impending changes. Prior to implementing the changes, it is also necessary to educate and train the HCWs on the new procedures. Additionally, leaders must validate the HCWs competency and understanding of the new procedure by repeating back the steps to the educator. The HCWs can be educated and trained in a classroom setting, virtual training sessions, and electronic training modules. This method would allow the health care leaders which HCWs have been educated and trained or not trained on the new product or procedure. HCWs who do not receive any

training on the new product or procedure may put the hospital at risk for a medical error to occur.

Recommendations for Further Research

My research study identified processes that health care leaders could improve upon to reduce medical errors and increase organizational profitability. I employed a qualitative approach to explore health care leaders' strategies for reducing medical errors to increase organizational profitability. I used a single-case study to collect data from six health care leaders with 5 years of experience at a hospital located in Southern California. I validated the information collected from the participants using member checking.

Three limitations identified when conducting this study were health care leaders with 5 years' experience and knowledge variations depending on the health care leaders' expertise. This limitation excluded health leaders with less than 5 or more than 5 years' experience but who may have had the expertise for in developing new strategies for reducing medical errors. Also, this study precluded health care workers from participating in this study for developing new strategies in preventing and reducing medical error from occurring in the future. Further research should include health care workers who would provide valuable information in developing new strategies for reducing medical errors.

Conclusion

The purpose of this research was to explore health care leaders' strategies for reducing medical errors and improving organization profitability. The participants selected for this research were six health care leaders with 5 years of experience with

implementing new strategies for reducing medical errors. During this research project, the health care leaders provided similar solutions addressing this business problem. The data were obtained using semistructured interviews. The interviews were conducted via video conferencing due to restrictions imposed on in-person meetings during the COVID 19 Pandemic.

Based on the interviews, five themes emerged: (a) team communication; (b) team collaboration; (c) coaching, education, and training; (d), performance improvement; and (e) leadership. Investigation of this business problem revealed that having a psychologically safe environment, HCWs are willing to speak up and escalate issues influencing patient care. Ongoing coaching, education, and training is needed annually to validate the HCWs competency. Also, there should be additional education and training on new processes and technology. Team communication and collaborations is an integral part of the HCWs daily routine with peer-to-peer communication, rounding with leadership, and patient care. The research indicated that strategies for reducing medical errors are constantly evolving and changing as new processes and technologies are implemented.

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Appendix A: Interview Protocol

Interview Protocol	
What you will do	**What you will say—script**
Introduce the interview and set the stage—often over a meal or coffee	Hello, I want to thank you for agreeing to participate in my research study. I have been working on my Doctorate in Business Administration focusing on leadership strategies for reducing medical errors. In this study, I will explore the link between leadership strategies for reducing medical and business profitability. My background includes a B.S. in Administration from University of Phoenix and MBA in Healthcare Administration from Walden University. My doctorate focuses on strategies for reducing medical error to increase organizational profitability. Thank the participant for participating in this interview. I will ask the participants if they have any additional questions before starting the interview. I will ask you 7 questions and will record your responses. The conservation will be kept confidential, and your identity and your company will be protected using a code developed for this study for 5 years on a protected in lock drawer. If you feel that you cannot answer a question, please let me know and will move on to the next questions. If you feel that you can no longer participate in this study, please let me know and I will remove you from this study.
· **Watch for non-verbal queues.** · **Paraphrase as needed.** · **Ask follow-up probing questions to get more in depth**	1. What are some of the strategies that you used to prevent and reduce medical errors that improved your hospital's profitability?
	2. How did you assess the effectiveness of the strategies and initiatives for reducing medical errors
	3. How did you implement new performance improvement strategies to decrease medical errors?
	4. Based upon your experience, how did the strategies transform behaviors and attitudes to reduce medical errors?

	5. What were your key barriers to transforming employees' behaviors and attitudes to reduce medical errors
	6. How did you overcome the key barriers to improve health care workers' commitment in reducing medical errors?
	7. What additional information would you like to share about the strategies that reduced medical errors to improve your hospital's profitability?
Wrap up interview thanking participant	Thank you for participating in my research study. I appreciate you taking time out of your busy schedule to help me complete my studies to achieve a Doctor of Business degree. I will follow up with you in a week and will send you a copy on my interpretation of your interview responses via email to review.
Schedule follow-up member checking interview	I would like to follow-up with you as part of the research process. I will provide you a copy of my interpretation of the interview to validate the accuracy of responses via email, phone all, or in-person.
Introduce follow-up interview and set the stage	I would like to arrange additional with you to ask some additional follow-up interview question for clarification.
Share a copy of the succinct synthesis for each individual question. **Bring in probing questions related to other information that you may have found—note the information must be related so that you are probing and adhering to the IRB approval.**	Today, I would like to share a succinct synthesis of the interpretated responses to the additional questions.
	1. Question and succinct synthesis of the interpretation—perhaps one paragraph or as needed
	2. Question and succinct synthesis of the interpretation—perhaps one paragraph or as needed
	3. Question and succinct synthesis of the interpretation—perhaps one paragraph or as needed

Walk through each question, read the interpretation, and ask: Did I miss anything? Or, what would you like to add?	**4.** Question and succinct synthesis of the interpretation—perhaps one paragraph or as needed
	5. Question and succinct synthesis of the interpretation—perhaps one paragraph or as needed

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Appendix B: Interview Questions

The following are six semistructured interview questions for the study. participants.

Interview Questions

1. What are some strategies that you used to prevent and reduce medical errors that improved your hospital's profitability?
2. How did you assess the effectiveness of the strategies and initiatives for reducing medical errors?
3. How did you implement new performance improvement strategies to decrease medical errors?
4. Based upon your experience, how did the strategies transform behaviors and attitudes to reduce medical errors?
5. What were your key barriers to transforming employees' behaviors and attitudes to reduce medical errors?
6. How did you overcome the key barriers to improve health care workers' commitment in reducing medical errors?
7. What additional information would you like to share about the strategies that reduced medical errors to improve your hospital's profitability?