2019

Evaluating the Discharge Process Improvement Initiative in Reducing the Length of Stay

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This is to certify that the doctoral study by

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Walden University
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Abstract

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MSN, Walden University, 2012

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Project Submitted in Partial Fulfillment

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Abstract

Extended hospital length of stay (LOS) causes increased health care costs and incidence of *never events,* such as hospital-acquired infections, pressure ulcers, and falls, which are not reimbursed by Medicare. This study examined if there would be a statistically significant decrease in the LOS of patients after the implementation of a discharge process improvement initiative (DPII), The model for improvement and small tests of change concept were used to guide the DPII at a hospital in northern California. Sources of data included archival data obtained from the hospital's quality improvement department that showed LOS prior to and after the implementation of the DPII. The LOS for 2015 and 2017 were compared using the *t* test for independent samples. The LOS in 2015 was longer ($M = 4.59$, $SD = 3.66$) than in 2017 ($M = 4.09$, $SD = 3.81$), a statistically significant difference, $M = 0.50$, 95% CI [0.32, 0.67], t (77) = 5.574, $p = .005$, $d = 1.3$, showing that the implementation of the DPII led to a reduction in the LOS. This reduction cannot be attributed solely to the DPII because other projects were implemented at the same time, such as the Clinical Decisions Unit and multidisciplinary rounds. Future research could focus on the relationship between reduced LOS and readmission and the degree of collaboration among health care team members. The implications of this study for social change include the potential to lower health care costs and increase patients' awareness of their responsibility for their own health.

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Dedication

To my dad, who, when I said that I would be changing my degree to Physical Therapy when I failed Chemistry I, said that I would end up a "pity" if I shifted after just one failed subject. To my mom, who encouraged me to get a master's degree because it would take me places. To my husband, who believed that I could go on to have a DNP. To my brothers, sisters, aunties, uncles, nephews, and nieces, who have always been there for me. To Gabe and Therese, my children, who have patiently waited for me to finish my homework so I can play with them and who cannot wait to call me "doctor." And to God be the Glory! To all of you, I dedicate this book.

Acknowledgments

I would like to thank Dr. Anderson, my adviser, who has been very patient with me and encouraged me to continue and finish this DNP project, and to all my instructors in Walden University, who have inspired me to continue studying and reaching my goals. Thank you to all my professors and clinical instructors in the University of the Philippines who taught me how to strive for excellence, how to serve, and how to make the world better than when I found it. I would also like to thank my preceptors and mentors for the learning I received as a bedside nurse and for inspiring me to reach new heights. To all the patients who have taught me lessons in nursing and in life, I thank you for the opportunity.

I am very grateful to my family, for always believing in me and encouraging me to finish this degree and for loving me unconditionally. Above all, I thank God, for all the blessings as well as the challenges that made me a better person. Thank you all for the love and help that you have given me as I went on this journey.

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Section 1: Overview of the Evidence-Based Project

Provision of care in the most efficient manner possible without compromising outcomes is warranted as health care costs continue to rise worldwide (Pratap, Varughese, Adler, & Kurth, 2013). In the United States, changes to reimbursement systems like the prospective payment system of the Centers for Medicare and Medicaid Services (CMS), diagnosis-related groups (DRGs) by third-party payors, and care models of health maintenance organizations (HMOs) influence decisions to initiate quality improvement programs to reduce patients' length of stay (LOS; Kaboli et al., 2012). While reducing LOS, care quality should be maintained or improved to show that cost-cutting did not lead to worsening care quality (Pratap, Varughese, Adler, & Kurth, 2012). Quality measures such as prevention of *never events*—conditions such as hospital-acquired infections, pressure ulcers, and falls that are not reimbursed by Medicare—improvement of hospital throughput, and prevention of readmissions are considered in determining the effect of lowering LOS. Efforts exerted towards reducing LOS while maintaining quality care without the use of additional resources could lead to cost savings in health care (Burns, Yee, Flett, Guy, & Cournoyea, 2013).

To reduce the LOS of patients, a discharge process improvement initiative (DPII) was started in a hospital in Northern California. There was an existing discharge process but it was not followed closely. The discharge process was reviewed by a team composed of bedside nurses, a director, quality improvement director, and case manager with the oversight of the VP of Nursing. This team discussed how to reduce the LOS and aimed to implement a discharge process that would focus on collaboration between health care

team members in providing care in a timely manner and addressing discharge needs at the time of admission. Patient and family involvement in the hospitalization and discharge process was a factor considered to help address discharge barriers. In planning for a process improvement to decrease LOS, the discharge process needed to be changed instead of just focusing on the geometric and actual LOS. The system needed to be changed to effect improvement (Pratap et al., 2012). This process improvement would improve the hospital throughput by opening beds in the floors, allowing for patients in the emergency department (ED) to be moved. Reducing the LOS of patients would improve patient flow from the ED to the patient rooms, facilitating early provision of nursing care (New, Andrianapoulos, Cameron, Olver, & Stoelwinder, 2013). This improvement in patient flow would facilitate the movement of patients from the ED to hospital beds and eventually to discharge either to home or skilled nursing facilities (SNFs; Burns et al., 2013). Provision of care early was seen to improve patient satisfaction as patients would not have to wait in the ED for a long time. It would also enable the hospital to provide services to more patients.

The Institute of Medicine (2010), through its report *The Future of Nursing Leading Change, Advancing Health*, recognized that nurses should be prepared to be leaders in collaborative efforts to change and advance health care. In response to this call, the American Association of Colleges of Nursing (AACN) discussed the essentials of the Doctorate of Nursing Practice (DNP) degree in 2006. To prepare for leadership positions in health care, the AACN emphasized organizational and systems leadership for quality improvement and systems and said a DNP-prepared nurse should achieve scholarship and

analytical methods for evidence-based practice (AACN, 2006). Participation in process improvement projects prepares a DNP student for future leadership roles in improving care quality and advancing health care.

Escalating health care costs and reduction of reimbursements have become a national and global concern. Process improvements that reduce the LOS without using additional resources while maintaining or improving care quality may offer a solution to this health issue. Evaluating the DPII in a hospital setting as it relates to LOS may offer insights upon which patient care and health system delivery can be improved.

Problem Statement

Increasing health care costs, reduced reimbursement from the Medicare prospective payment system, DRGs of third-party payors, and HMO care models have driven hospitals to reduce the LOS of patients (Kaboli et al., 2012). Extended LOS has been shown as a causative factor in the development of hospital-acquired complications such as infections, pressure ulcers, and falls (Kaboli et al., 2012; Theisen, Drabik, & Stock, 2012). These conditions in turn extend the LOS, requiring more intensive medical and nursing care (Theisen et al., 2012). The CMS does not reimburse costs for never events such as Stage III and IV hospital-acquired pressure ulcers and patient injuries resulting from falls (Burton, Fields, Outlaw, & Deleon, 2013; Davidson, Dunton, & Christopher, 2009), which makes hospitals focus more on reducing LOS. Aside from cutting costs, reducing the LOS improves patient satisfaction by improving patient throughput from the ED to the hospital floors so patients receive care in a timely manner (Burns et al., 2013).

Barriers to discharge have a big impact on the availability of beds for newly admitted patients, which affects patient flow from the ED to the different units in the hospital (New et al., 2013). Reducing the LOS opens beds for newly admitted patients, enabling a hospital to serve a bigger number of patients. In reducing the LOS of patients while reducing costs, patient care quality and outcomes should not be compromised (Burns et al., 2013; Pratap et al., 2012). Improving the discharge process is a measure for reducing the LOS and improving patient outcomes as well (Pratap et al., 2012). This can lead to better patient flow and facilitate transfer to rehabilitation facilities or discharge to homes. Benchmarking, process standardization, and development of decision support tools are also measures that can lead to a decrease in the LOS while improving patient care efficiency (Burns et al., 2013). This can translate to better patient outcomes, lesser costs, improved patient flow from acute care settings to rehabilitation facilities, and and increased number of patients receiving services (Burns et al., 2013).

The problem addressed in this scholarly project was the extended LOS of stay of patients in the hospital and the need to evaluate measures that were implemented to improve LOS. The average LOS of patients was three days based on the DRGs. LOS beyond three days was considered high, so it was attempted that the patients were discharged before the average LOS was reached.

The focus of this scholarly project was an evaluation of the DPII implemented in the facility where I worked. Given federal and insurance regulations, quality measures, and patient satisfaction, hospitals are finding ways to reduce the LOS without compromising patient care quality and outcomes. Addressing the LOS does not only

affect an organization's finances but also affects the progress and continuity of patient care and patient satisfaction. This will translate to increased patient safety and satisfaction through the involvement of the patient and family in the discharge planning process. The movement for better care quality and safety are additional drivers for reducing the LOS. In reducing the LOS, hospitals are poised to meet the Institute of Medicine's dimensions of quality of providing safe, effective, patient-centered, efficient, timely, and equitable care (Pratap et al., 2012). Reducing the LOS without the use of additional resources will lower health care costs while improving patient outcomes and satisfaction. This is a national goal that warrants the attention of hospitals.

Purpose Statement

This evidence-based practice project aimed to evaluate the DPII, which was implemented in a hospital to reduce the LOS. The DPII involved the health care team, the patient, and the family in the discharge planning process, which was initiated from the day of admission. The evidence gained from this scholarly project will be used for continued process improvement in reducing the LOS without compromising delivery of quality care.

Nature of Doctoral Project

The main goal of the DPII was to initiate discharge planning from the day of admission. The patient and the family were informed of the expected LOS in the hospital and the anticipated day of discharge to prepare them. The DPII involved the whole health care team to ensure that services were given in a timely manner. The patient care checklist (PCC) was a hand-off tool that was passed from staff on one shift to the next

and highlighted the discharge needs and the barriers to discharge. Process improvement projects can be used to reduce the LOS and at the same time maintain quality outcomes within an organization (Pratap et al., 2012). The collaboration of the health care team with the patient and family enables everyone to address discharge barriers early on admission. This evidence-based practice project used outcome measures such as pre- and post-test to evaluate whether the DPII reduced the LOS of patients. The LOS prior to and after the implementation of this initiative were compared. Outcome measures, such as pre- and post-test scores, are widely used by clinicians and policy makers in measuring quality of patient care (Pronovost & Lilford, 2011). Analysis of the data helped determine whether improvements in the discharge process resulted in reduced LOS of patients.

Significance

Reducing the LOS of patients is not only a sound financial decision for a hospital but also affects patient care and facilitates continuity of care, which translate to lower health care costs and improved patient safety. Involving the patient and the family in discharge planning helps patients take responsibility for their transition to the home or community and their health. This helps lower health care costs for the whole nation as patients see that acute care facilities do not provide extended care and that part of the recovery from an acute condition depends on their ability to take care of themselves after hospitalization. There are community resources that could help patients and their families achieve optimal health. The goal of providing safe, effective, patient-centered, efficient, timely, and equitable care established by the Institute of Medicine (Pratap et al., 2012) was addressed in improving the discharge process in the organization under study.

Summary

The implementation of the DPII had the potential to reduce the LOS of patients while maintaining or improving quality measures. Reducing the LOS while maintaining or lowering the amount of resources used will have a positive impact on health care costs, which can be beneficial not only at the organizational level but at a national level as well. Positive results from this scholarly project could be adopted in other health care systems to promote care delivery improvement that can translate to lower health care costs throughout the country.

Section 2: Background and Context

Rising health care costs, changes to reimbursement systems from the CMS, third-party payors, and HMOs have driven hospitals to develop initiatives to reduce the LOS in the United States (Kaboli et al., 2012). Providing quality care using fewer resources and without compromising outcomes is a goal that hospitals aim to achieve (Pratap et al., 2013). Reducing the LOS of patients in the hospital is a means to lower health care costs. The quality of care should not be compromised while reducing the LOS and cutting costs (Pratap et al., 2012) by improving hospital throughput and preventing never events.

The problem addressed in this DNP project was the LOS of patients in a particular hospital, which was beyond the three-day average LOS prescribed by most DRGs. To reduce the LOS of patients, the hospital embarked on a DPII to improve the existing discharge process. The new discharge initiative was focused on the collaboration of the health care team in ensuring that patient care was done in a timely manner and discharge planning was initiated at the time of admission. The DPII also focused on collaboration between the patient and family and the health care team in addressing discharge barriers early in the hospitalization. The practice-focused question that this project attempted to answer was whether the DPII resulted in the reduction of the LOS of patients in the hospital. This section of the DNP project addressed the concepts, models, and theories that informed this project, its relevance to nursing practice, local background and context, the role of the DNP student, and the role of the project team.

Concepts, Models, and Theories

Model for improvement. The model for improvement (MI) was used to inform

the DPII (see Figure 1). This model was used to guide quality improvement efforts as the focus is on the elements that are important for success (Pratap et al., 2012). To achieve results, the system needs to be changed as neither increased attention to the problem nor increased efforts to solve the problem will produce the needed change (Pratap et al., 2012). In using this model, objectives and goals are identified, along with how to measure improvement and the changes that will lead to improvement (Pratap et al., 2012). The MI answered these questions: What are we trying to accomplish? How will we know that change will be an improvement? What changes can we make that will result in improvement? (Singh, Sanderson, Galarneau, Keister, & Hickman, 2013). The advantage of this model is that it requires measurement of progress at set intervals and allows some changes as needed (Singh et al., 2013). The plan-do-study-act cycle is a feature of the MI that allows for continuous evaluation of the project and the introduction of changes to improve the process (Singh, et al., 2013).

The MI was useful in this project as the DPII involved a process change that aimed to reduce the LOS of patients in the hospital. The changes that were expected from the DPII were the discharge of patients within the prescribed LOS through the collaboration of the health care team, the patients, and their families as well as having discharge barriers addressed at the time of admission. The focus of the DPII was on improving the discharge process through the involvement of the health care team, patients, and their families, which is vital to process improvement projects. In using the MI, the collaboration of the health care team and the leadership team would help change

the culture of the organization rather than just create individual change (Singh et al., 2013).

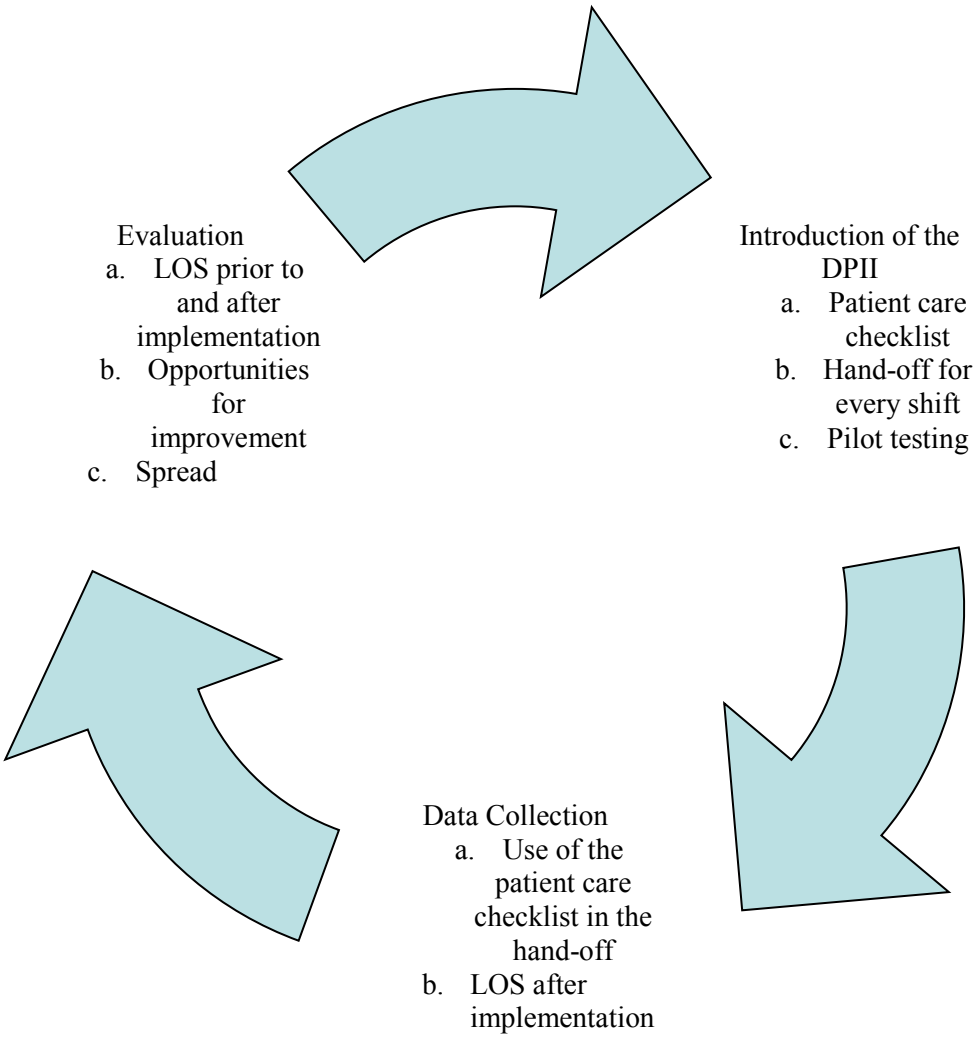

Figure 1. Model for improvement. Adapted from "Quality Improvement on the Acute Inpatient Psychiatry Unit Using the Model for Improvement," by K. Singh, J. Sanderson, D. Galarneau, T. Keister, & D. Hickman, 2013, *The Ochsner Journal, 13*(3).

Small tests of change. A feature of the MI is the concept of small tests of change (Pratap et al., 2012). This concept involves the introduction of small changes that can

unsettle the system and could lead to bigger changes in the discharge process. This concept was applicable to the project as the initiative was done one floor or unit at a time. This concept allows for early evaluation of the initiative and modifications and improvements as the initiative expands. It involves celebrating small victories that help in increasing staff buy-in and engagement. Quality improvement projects go through a cycle that includes innovation, pilot, implementation, and spread (Singh et al., 2013), which was followed in the DPII.

Relevance to Nursing Practice

Increasing health care costs and demand in care quality and improved patient safety have driven hospitals to look at ways to provide care in the most efficient manner with the least use of resources (Pratap et al., 2012). In reducing the LOS using the DPII, process improvement was utilized. The DPII likewise improved the discharge process with increased collaboration between the health care team, patient, and family in discharge planning. When discharge barriers are addressed at the time of admission, patients can be discharged responsibly to the community within the LOS prescribed by the DRG. The presence of discharge barriers considerably impacts bed availability (New et al., 2013). Reducing the LOS can lead to lower incidence of preventable complications of long hospital stays such as hospital-acquired pressure ulcers and falls, which could translate to lower health care costs. Discharging patients early to SNFs or the community could enable the initiation of rehabilitation and reduce acute care costs (Burns et al., 2013; New et al., 2013).

Discharge planning has been traditionally performed by case managers based on patient needs, evaluation by physical therapists and occupational therapists, and doctors' recommendations. This was usually done when the decision to discharge was reached. Initiating discharge planning from admission by discussing the expected LOS with members of the health care team, patients, and their families has been shown to increase the awareness of everyone to move care progressively towards discharge and to the post-acute care facility. Process standardization can be used in reducing LOS through the identification of a tentative date of discharge on admission, which facilitates early discussion of the discharge plan and enhances the collaboration of the health care team with patients and their families towards achieving the goal (Burns et al., 2013).

Nurses perform a vital role in improving the discharge process and reducing the LOS as they spend the most time with the patients and could facilitate the collaboration of the health care team to address patient needs. Increasing the involvement of the patient and the family by discussing discharge plans and assessing discharge barriers could help in preparing the patient to move to a lower level of care. Additionally, this could empower the patients by engaging them in care and preparing them for discharge. The DPII could help advance nursing practice through increased collaboration of the health care team and increased engagement of patients and their families in the care and management of illnesses. This could lead to substantial cost savings with the provision of care using less resources yet optimizing outcomes.

Local Background and Context

This doctoral project was conducted in a not-for-profit, fully accredited, regional hospital with 366 beds and over 400 physicians and 2,000 employees (Dignity Health, n.d.). It is the largest hospital, private employer, and charitable institution in San Joaquin County. Its centers of excellence include heart, cancer, and women and children's care including a neonatal intensive care unit. The hospital is a recognized center for cardiac surgery in Northern California and has been voted the most preferred hospital in San Joaquin County for 13 consecutive years (Dignity Health, n.d.). The ED sees an average of 250 to 275 patients per day. The patient mix includes 80% Medicare and 20% other payor sources, including uninsured patients. In 2015, the facility had an average LOS of 4.2 days, which was higher than the goal of 3.8 days set by the corporation. Data from 2015 showed it took about four hours from the time a discharge order was written to the actual departure of the patient from the hospital.

Given the average LOS and the time it took for a nurse to discharge a patient, bed capacity was impacted. The hospital merged with a major HMO in May 2016, which increased the patient census by 25 to 35%, requiring more beds. There was an increased number of patients in the ED and they needed more beds; these patients could be moved only if patients were discharged from the patient floors. An improved discharge process was needed to help in the movement of patients from the ED to the floors and facilitation of patient throughput in the hospital.

Role of the DNP Student

As the supervisor of the case management department, I had helped the nurses in addressing discharge barriers through the involvement of the case managers. I helped align the case management processes to the DPII so that the whole health care team would be on the same page as to the progress of care and discharge needs of the patients. I provided help in the DPII by assisting the nurse champions in explaining the process to the different floors as the initiative expanded.

Joining the DPII team was an opportunity to complete my practicum hours; my role as a DNP student was to evaluate the DPII. I participated in the discussion of the findings as a DNP student and provided literature as evidence for the program. As a DNP student, I observed the communication skills and critical thinking skills of the directors and members of the leadership and management team when they discussed the outcomes with the team or with the director of quality improvement.

When I became a case manager, I became interested in providing quality care while maintaining costs. I focused on the provision of medically necessary care in the safest and most prudent setting while at the same time responsibly discharging patients. I was motivated to evaluate the DPII as I wanted to know how a nurse-led initiative could improve care quality. I wanted to learn how a program was planned from the beginning up to its evaluation and how to ensure its sustainability.

I had worked in the facility for 10 years and had been a supervisor for three years. I saw this as a a source of potential bias because nurses knew me as a supervisor and not as a student who was also learning in the process. I introduced myself as a DNP student

when I participated in the initiative so that the directors would see me as a novice learning from the discussions about improving nursing practice. I tried to do my practicum hours away from the units where I used to work as a case manager or a bedside nurse so I could introduce myself as the student and explain what my role was. During meetings, I imparted my expertise in case management but at the same time learned from the program process.

Summary

Reducing the LOS means using fewer resources while providing care. This can be achieved while still maintaining or improving quality and safety by improving the discharge process, in this project through the DPII. Looking at the background and the context of the project, literature has shown that improving the discharge process can lead to a reduction in the LOS, improving hospital throughput and reducing preventable complications, which could translate to lower health care costs. This has implications for nursing practice as the nurse becomes responsible for enhancing collaboration among health care workers as well as engaging patients and their families in their health. In so doing, the DPII may affect quality measures and patient outcomes and at the same time reduce health care costs.

Section 3: Collection and Analysis of Evidence

Increased costs in health care, reduction in reimbursements from different payors, and regulations from the CMS have driven hospitals to seek ways to reduce patient LOS while improving care quality (Kaboli et al., 2012 Pratap et al., 2012). Extended LOS has shown to cause hospital-acquired conditions such pressure ulcers, infections, and falls, which further increase the cost of care for patients. Additionally, the rehabilitative potential for patients that could be provided in a lower level of care is decreased by lengthy hospitalization.

To reduce the LOS in a hospital in Northern California, the DPII was implemented so that patients and their families were informed of the expected LOS. On admission, a nurse assessed the discharge plan for the patient and identified barriers to discharge with the help of the patient and the family. Informing the patient and the family of the expected LOS in the hospital helped prepare them for discharge. The members of the health care team were made aware of the expected LOS so that care progressed daily and barriers to discharge were addressed.

The DPII was implemented in a 366-bed nonprofit, fully accredited regional hospital. In 2015, the LOS of patients was 4.2 days. The corporate goal for LOS was 3.8 days. The DPII aimed to cut down the LOS of patients to 3.5 days. Section 3 of this project addresses the practice-focused question, sources of evidence, and analysis and synthesis of evidence.

Practice-Focused Question

One of the reasons for extended LOS was the presence of discharge barriers that were not identified early on admission. Patients (and families) were resistant to discharge because they felt that they were not ready to take care of their health needs after discharge. The DPII improved upon an existing discharge process by focusing on the barriers to discharge on the day of patient admission and on collaboration of the health care team to provide the services necessary to progress the care of the patient. Increased involvement of the patients, families, and members of the health care team in addressing the needed care and the discharge barriers on admission would facilitate care provision in the hospital as well as address the post-acute-care needs of the patient. This initiative called for bedside nurses from all shifts to work actively on barriers to discharge as well as to communicate such to other staff following shifts. Was there a reduction in the LOS following the implementation of the DPII? This was the practice question that this DNP project attempted to answer by evaluating the DPII.

To ensure understanding of the terms used in this project, the following definitions are provided.

Diagnostic-related group (DRG): any of the payment categories that are used to classify patients and especially Medicare patients for the purpose of reimbursing hospitals for each case with a fixed fee regardless of the actual costs incurred.

Geometric length of stay (GMLOS): the national mean length of stay for each DRG as determined and published by the CMS.

Arithmetic length of stay (ALOS): the average length of stay experienced by a patient within a chosen DRG.

Sources of Evidence

The LOS was used to evaluate the outcome of the DPII. Information on the LOS before the implementation of the DPII was used as a baseline and compared to data produced from the implementation of the DPII in order to determine the effect of the improved discharge process. Collection of these data provided evidence on how improving the discharge process—by initiating discharge planning on admission, increasing collaboration among the health care team, and involving patients and their families—could result in reduced LOS.

Archival and Operational Data

This project was an evaluation of the DPII, which was implemented in the hospital. This was a process improvement initiative so data pertinent to the LOS of patients was used. Data on the LOS in 2015, before the implementation of the DPII, was used to determine the average LOS of patients. The PCC was useful in identifying how discharge needs were addressed throughout a patient's hospitalization.

The GMLOS and the LOS were readily available from the reports generated in the care coordination department. This was useful as care coordinators used these numbers in their discussion with charge nurses in the daily whiteboard rounds and with the physicians in the daily rapid rounds. The director of quality improvement shared the data from before and after the DPII implementation, which had been submitted by

different floors of the hospital. I worked closely with the director to gain access to the information.

Participants and Procedures

The director of quality improvement collected and collated all the PCCs from the different units of the hospital, using them to generate a report. I collected the data from the director in order to evaluate the DPII.

Protections

Collection of information was not done until approval for the study was given. I sought approval first from the Walden University Institutional Review Board (IRB). The Walden IRB approval number 08-04-17-0145751 was obtained. The approval of the hospital for me to collect the data from the DPII was likewise sought. Patient information was handled in accordance with the Health Insurance Portability and Accountability Act to protect the privacy of the patients. Patient names and other personal information were not included in the data. All the data and reports remained in the facility and with the department responsible for collecting them.

Analysis and Synthesis

Data on the LOS of patients prior to the DPII were collected and constituted the pretest data. Using *t* tests for independent samples, the pretest data were compared with posttest data to determine whether the LOS in the pre- and posttest period were statistically significantly different. The average number of patients in one floor is 750 per month. The LOS of these patients prior to the implementation of the DPII was compared

to their LOS after the implementation. The pre- and posttest data were compared to determine if there was a statistical difference.

Summary

Reducing the LOS in acute care settings has been the response of hospitals to increasing health care costs, reduced reimbursements from payor sources, and complications from lengthy hospitalizations. Process improvements such as the DPII are a way to reduce LOS. The initiative involved collaboration of the health care team to ensure that services were provided to progress the care of patients and prepare them for discharge. Involving the patients and the families in identifying barriers to discharge at the time of admission was seen to facilitate discharge to the community. The information obtained from this initiative could be used for continuous improvement.

Section 4: Findings and Recommendations

The purpose of this project was to evaluate the DPII's implementation in a hospital. The DPII was a process improvement initiative aimed at reducing the LOS of patients through the initiation of discharge planning on the day of admission, which involved informing the patient, family, and members of the health care team of the GMLOS and the anticipated day of discharge. Discharge needs and barriers were discussed on the day of admission to prepare patients and their families for discharge and transition to a lower level of care. Reducing the LOS is a means by which hospitals can keep up with changes in reimbursements from different payor sources (Kaboli et al., 2012). Using fewer resources can potentially help in reducing health care costs.

The members of the health care team were informed of the GMLOS, which was written on the patients' whiteboards in the rooms. Patients and families were informed of the GMLOS along with the plan of care. Discharge barriers were identified so the case manager and the family could work together to prepare the patient for discharge. Identifying discharge barriers late in the hospital stay could increase the LOS because patients and their families were unprepared for the discharge. This study examined if the implementation of the DPII resulted in reduction in the LOS. The difference in the LOS before and after the implementation of the DPII was examined and the statistical significance was determined. The LOS was measured in weeks. Archival data of the LOS in 2015, the year prior to the implementation of the DPII, was used as the pretest data and the LOS after the implementation was used as posttest data. The pre- and posttest data were compared using *t* tests for independent samples. This project aimed to answer the

practice question: Was there a reduction in the LOS following the implementation of the DPII? The data included a wide period of hospital LOS, from 2015, which was the year prior to the implementation of the DPII, through 2017, which was a year after the initial implementation of the initiative. The data included the LOS of patients in all inpatient units in the hospital regardless of insurance or payor sources.

Findings and Implications

In 2015, prior to the implementation of the DPII, patients stayed in the hospital for an average of 4.49 days. The longest average monthly LOS of 5.32 days was in September 2015 and could be attributed to diagnoses, severity of illness, and changes in the weather conditions in the area. The shortest average monthly LOS of 3.93 days was in August 2015; traditionally, the shortest LOS has been seen in the hospital during the summer season. From October to December 2015, the average LOS was 4.70.

The DPII was initially implemented on March 28, 2016, with pilot testing in one of the medical-surgical floors of the hospital. The average LOS in March 2016 was 4.46 days and in April 2016 it was 4.36 days. There was a drop in the average LOS in May 2016 to 3.99 days. Then there was a dip in the average LOS in June 2016 to 3.92 days, which is attributable to it being a summer month.

In 2017, the year following the implementation of the DPII, the longest average monthly LOS was 5.14 days and the shortest average monthly LOS was 3.36 days. The mean LOS for 2017 was 4.20 days.

Table 1 shows the comparison of the LOS prior to and after the implementation of the DPII. The data were taken from the weekly average LOS in all the floors and critical

care units in the hospital. Data for only 27 weeks in 2015 were available from the quality improvement department. Data for 52 weeks were available for 2017. Based on the group statistics, the LOS in 2015 ($M = 4.59$, $SD = .366$), prior to the implementation of the DPII, was longer than in 2017 ($M = 4.09$, $SD = .381$), after the implementation of the DPII.

Table 1

Group Statistics

Year	*n* (weeks)	Mean	Std. Deviation	Std. Error Mean
2015	27	4.5978	.36637	.07051
2017	52	4.0998	.38173	.05294

The *t* test for independent samples was calculated using IBM SPSS Statistics 25 to analyze whether there was a reduction in the LOS following the implementation of the DPII. There was homogeneity of variances for LOS for 2015 and 2017, as assessed by Levene's test for equality of variances (see Table 2). The *t* test revealed the LOS in 2015 was longer ($M = 4.59$, $SD = 3.66$) than in 2017 ($M = 4.09$, $SD = 3.81$), a statistically significant difference, $M = 0.50$, 95% CI [0.32, 0.67], t (77) = 5.574, $p = .005$, $d = 1.3$.

Table 2

Independent Samples Test

	Levene's test for equality of variances		*t* test for equality of means						
	F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Diff.	Std. Error Diff	95% CI Lower	95% CI Upper
Equal variances assumed	0.186	.668	5.574	77	.0000	0.49797	0.08934	0.32008	0.67468
Equal variances not assumed			5.6480	54.710	.0000	0.49797	0.08817	0.32126	0.67468

Figure 2 is a simple bar graph of the LOS in 2015 and 2017.

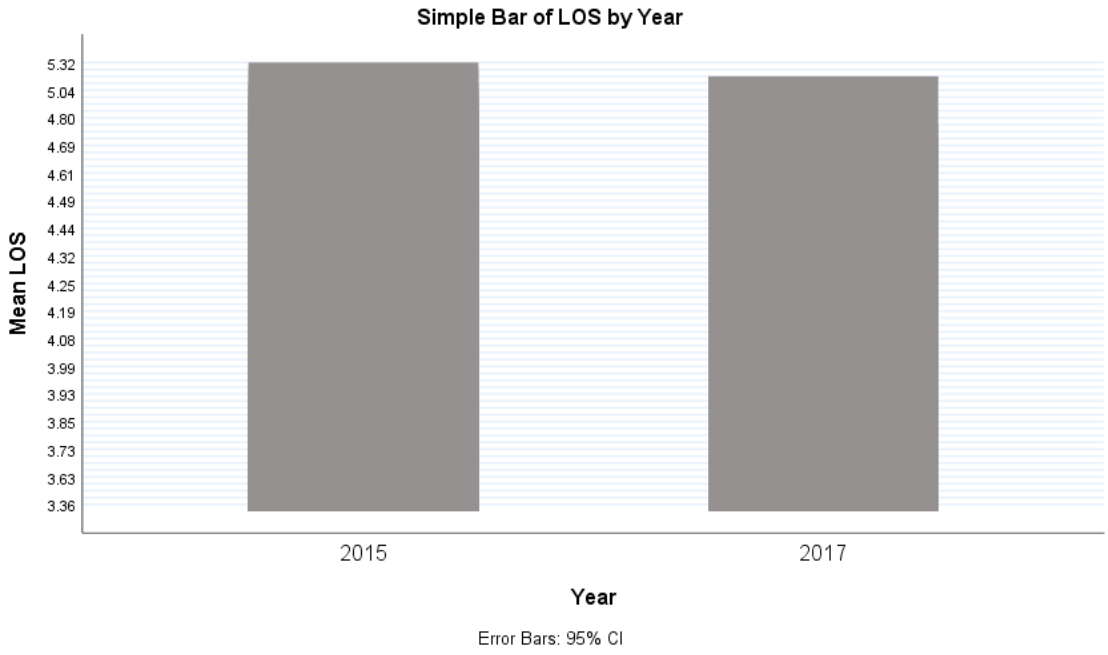

Figure 2. A simple bar graph showing average LOS for 2015 and 2017.

A second *t* test for independent samples was used to compare the LOS in 2015 and 2017 using 27 weeks and LOS from June to December. This was done to see whether

there was a reduction in the LOS between 2015 and 2017 given similar conditions. Table 3 shows the comparison of the LOS for 27 weeks in 2015 and 2017, from the week of June 28 to the week of December 27 for 2015 and 2017. Based on the group statistics, the average LOS prior to the implementation of the DPII in 2015 ($M = 4.59$, $SD = .366$) was longer than after its implementation in 2017 ($M = 3.99$, $SD = .337$).

Table 3

Group Statistics for LOS in 2015 and 2017 Using Equal Number of Weeks

Year	*n* (weeks)	Mean	Std. Deviation	Std. Error Mean
2015	27	4.5978	.36637	.07051
2017	27	3.9944	.33743	.06494

Based on the Levene's test for equality of variances ($p = 0.764$), there was homogeneity of variances for LOS in 2015 and 2017 (see Table 4). The *t* test showed the LOS in 2017 was shorter ($M = 3.99$, $SD = .33$) than in 2015 ($M = 4.59$, $SD = 0.36$), a statistically significant difference, $M = 3.99$, 95% CI [0.41, 0.79], t (62) = 6.294, p = .000006, $d = 1.7$.

Table 4

Independent Samples Tests for LOS 2015 and 2017 Using Equal Number of Weeks

	Levene's test for equality of variances		*t* test for equality of means						
	F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Diff.	Std. Error Diff	95% CI Lower	95% CI Upper
Equal variances assumed	0.91	.764	6.294	52	.0000	0.60333	0.9586	0.41099	0.79568
Equal variances not assumed			6.294	51.652	.0000	0.60333	0.9586	0.41095	0.79571

Comparing the same number of weeks in the same months for 2015 and 2017 showed there was a reduction in the mean LOS in the hospital. The summer reductions in the LOS can be attributed to the season. The reduction in the LOS to 3.96 in May 2016 can be attributed to the DPII, which was implemented in March 2016. Follow-up by the leadership team with floors that were not following the initiative helped increase awareness among the staff. Daily reporting of the results to the leadership team with discussion of reasons for delayed discharges with the managers of the floor put a strong emphasis on the initiative. Figure 3 is a simple bar graph of the mean LOS in 2015 and 2017 using 27 weeks and average LOS from June to December.

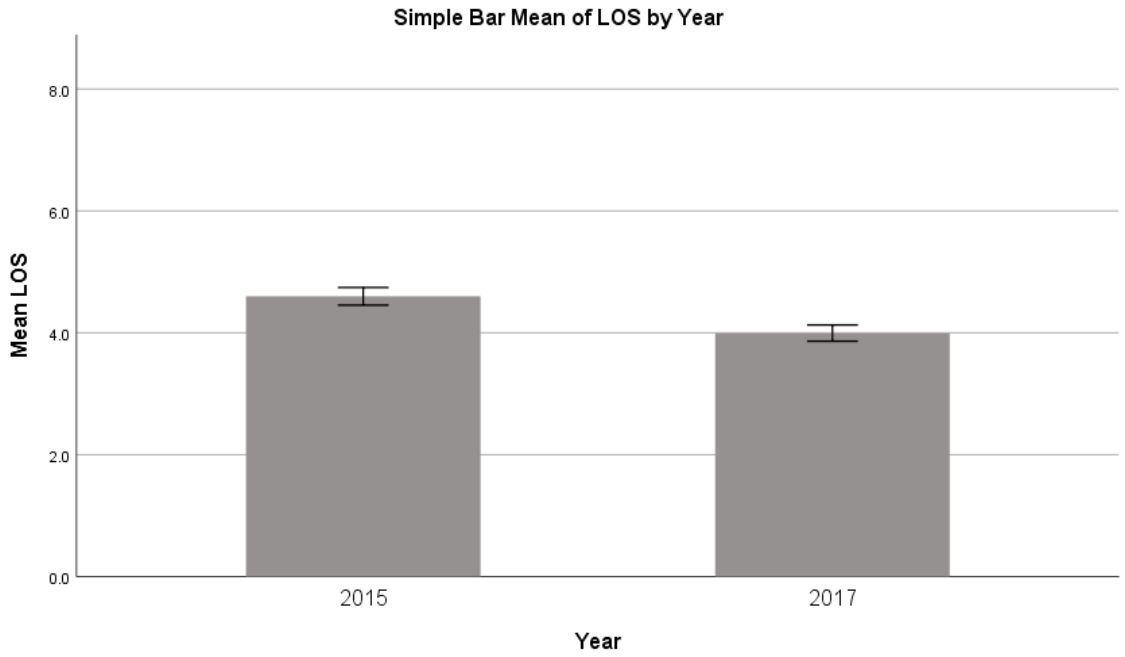

Figure 3. Mean LOS for 2015 and 2017 using equal number of weeks.

Along with the DPII, other projects were implemented. These projects included the Clinical Decisions Unit, an eight-bed unit for newly admitted patients from the ED. The Clinical Decisions Unit was used as an admission floor, where the admission database was filled out by the nurses in the unit, relieving the receiving nurse of the responsibility. This served as an incentive for bedside nurses, because they no longer thought that when they discharged a patient, they would have to admit a new one. Knowing that the admission database and the first orders had been addressed gave the bedside nurses relief.

In addition, the multidisciplinary rounds was initiated. This involved daily rounds with the nurse case managers, hospitalist group, home health care liaisons, charge nurses, and radiology, physical therapy, and pharmacy department supervisors attending. The patients seen by the hospitalists were discussed, with emphasis on their plan of care,

discharge needs, and barriers to discharge. Through the multidisciplinary rounds, the patients' plan of care was discussed and the service reponsible for advancing the care took accountability. Discharge needs and barriers were anticipated, and the registered nurse case managers worked on discharge needs to prepare for discharge.

There was a corporate-wide effort to lower the LOS, which further strengthened the DPII. There was strong leadership support with an identified escalation process that helped in implementing and sustaining the initiative.

Unanticipated Limitations or Outcomes and Potential Impact to Findings

On May 1, 2016, the hospital merged with an HMO, which brought 25% increase in patient census. This merger caused the reduction of services of another community hospital hence, the influx of patients to this hospital. The ED underwent expansion to accommodate the increasing number of patients. This increase in the census may have affected the LOS due to increase in the volume of patients. The merger also brought in physicians who were still learning the culture of the hospital and the staff. There was a new population of patients who may have been used to the other hospital which may not have the same focus on LOS as this hospital. The implementation of the multidisciplinary rounds, opening of the Clinical Decisions Unit, expansion of the ED and adding more rooms and beds in the hospital were changes that may have impacted the findings. Focus on reducing the LOS and improving patient satisfaction may have contributed to the findings.

Discussion of Findings in the Context of the Framework and Literature

The findings showed that the reduction of the LOS due to the implementation of the DPII was statistically significant. The MI was used to evaluate the DPII, which was a process improvement project that involved changing the whole process of patient discharge. This process improvement project involved the whole health care team and increased their collaboration with patients and their families. Small tests of change were used with the DPII, starting in one floor that served as pilot for the initiative. The DPII was carried out in one floor after another with ongoing evaluation, innovation, and spread. Quality improvement projects involve continuous implementation, innovation, and evaluation (Singh, et al., 2013). There were fluctuations in the LOS following the implementation of the DPII, which could be caused by factors such as weather conditions that exacerbate certain illnesses and the degree of engagement of staff and the leadership team. The engagement of the staff, in turn, could be influenced by factors such as the presence of other projects, which resulted in shifting of focus. Leadership engagement likewise influences process improvement projects with different foci in the organization. Leadership and management should be able to maintain a constant purpose of improving quality (Zarbo, 2012). The reduction of the LOS can also be attributed to other initiatives that started alongside the DPII.

Implications of the findings for individuals. The findings showed a statistically significant reduction in the LOS in an acute care setting with the implementation of the DPII. The DPII increased the awareness of patients, families, and members of the health care team in regards to the GMLOS given the diagnoses. Given the expected LOS and

identification of barriers to discharge, patients and families were able to anticipate the discharge date and plan to help the patient transition to the next level of care. Gone are the days when patients stayed in the hospital until they were back to their baseline strength and health. This is a culture change in that patients are sent home still sick, accepting that the care can be continued in the home using community resources. There is a need to educate physicians on how decreasing the LOS can reduce health care costs as well as how hospitalists and primary care physicians can participate in the continuity of care of patients from the hospital to the home.

Implications of the findings for communities. The development of community programs and increase of community resources to help with post-acute care should be done to provide a safe transition of patients. Primary care physicians should be able to coordinate the care of patients. Home health care agencies and SNFs should be better prepared to provide care for patients with increased care needs.

Implications of the findings for systems. Health care systems should consider training for health care personnel on the LOS and how to discuss this with patients and families. Increased collaboration among the health care team should be enhanced as they work towards progressing the care of patients and providing services in a timely manner. Primary care clinics and their physicians will be impacted by this because continued implementation of the DPII could lead to lower LOS, which would transition patients to the primary care setting earlier than they used to be. Primary care physicians should be ready to coordinate the care of patients at a lower level of care and manage patients at the outpatient setting.

Implications for positive social change. The DPII can potentially start a culture change wherein patients and families are better informed of their role in the management of their health and illness. Patients and their families will have a sense of responsibility for their health and health-seeking behaviors as well as use primary health resources from the community instead of always turning to the hospital for disease management. The health care team will know how they can help in lowering health care costs by rendering services in a timely manner. This will increase emphasis on transitioning and coordinating care to prevent expensive disease management in an acute care setting.

Recommendations

There was a reduction of the average LOS of patients from 2015 to 2017 after the implementation of the DPII. But based on the monthly average LOS, there were still fluctuations. This could be related to diagnosis, population, or seasons of the year when the rate of exacerbation of disease is greater. Hospital staffing challenges could have contributed to delays in discharging patients. There are other causes of delay in the discharge process, which this study was not able to identify. Hospitals can look at specific reasons for discharge delays and institute changes or initiatives to address them.

Although this study did not measure the degree of collaboration among the health care team members and the response of the patients and families, the information from this study could be used by hospitals and health care systems in developing projects for reducing the LOS of patients. Other health care facilities such as SNFs could conduct the same study to find ways to facilitate discharge and address barriers to discharge that

could lead to lower LOS. Accountable care organizations could consider this initiative in reducing both acute and post-acute care LOS.

This study did not further analyze if the reduced LOS affected the readmission rates of patients, particularly those with chronic medical conditions. Whether the decreased LOS caused an increase in the readmission rates of patients due to premature discharges is unknown. Future research could be conducted to find the correlation between the LOS and the readmission rates of patients.

The information obtained in this study could provide additional knowledge to hospitals and health care systems on the reduction of LOS through increased patient and family involvement and improved collaboration of the health care team. Hospitals and health care systems could consider opportunities of improving the progression of patient care through collaboration of the health care team and care coordination in the acute and post-acute care settings.

Strengths and Limitations

This study has its strengths and limitations. The first strength of this study is its timeliness. At a time when health care expenditures continue to rise and there is great clamor for care quality and safety, this study presents one possible way to address patient care quality while reducing health care costs. The DPII provides an opportunity to look at LOS, improve collaboration, and strengthen care coordination across the continuum of care. This study also provides information on how a culture change for patients, families, and health care team members could possibly influence how the population views the health care system and increase people's sense of responsibility for their health.

The framework used to guide the DPII was another strength of the study as it involved members of the health care team in the initiative. There was a continuous process of innovation, implementation, and evaluation of outcomes that provided opportunities for improvement.

One of the limitations of this study is its focus on the LOS prior to and after the implementation of the DPII. The study did not include other variables that could have influenced the initiative such as diagnoses, other projects implemented alongside the initiative, and engagement of the health care team in the initiative. This study was done in a hospital, where the whole organization embarked on reducing the LOS, so awareness of reducing the LOS was heightened. There were several projects geared towards reducing the LOS, so it cannot be concluded that the DPII was the only reason for the reduced LOS. Further, this study cannot be generalized to other hospitals, which may have a different patient population, different prevalent diagnoses, and different organizational set-ups. Another limitation is that the study did not look at readmission rates after the reduction of the LOS.

Based on the limitations of this study, it is recommended that future studies focus on certain diagnoses and the reduction of LOS using the DPII. The degree to which progress of care and care coordination could help in reducing LOS should also be studied. The relationship between lower LOS and readmission rates could be studied to provide more information about the effects of reducing the LOS.

Section 5: Dissemination Plan

Hospitals are finding ways to reduce the LOS due to increasing health care costs and changes in the reimbursement systems from payor sources. Dissemination of the results of this study will start in the hospital where the DPII was implemented. The first audience will be the Nursing Council members so that the directors and managers who were instrumental in the implementation of the initiative will be informed of the results. Another venue will be the meeting of the first-line supervisors to provide them information on the change as a result of their work. The Hospital Quality Committee will be the next audience to which to present the process improvement and its result on the LOS. The Patient Advisory Council will then be informed of the result so that they can help in further providing information to their members.

This study will be disseminated to the Care Coordination and Quality Council at the corporate level through poster presentation in one of the yearly conferences so that other facilities will learn about the process improvement project. For a wider audience, the study will be presented to Hospital Case Management through its website or journal. This can provide information to care coordinators looking for ways to reduce the LOS.

Analysis of Self

When I was starting this project, I was promoted as the manager of the care coordination department of the hospital. I have been a supervisor for three years in the department, so my involvement in the hospital was limited, as I was mostly managing the department staff. When I became manager, I was introduced to other managers and directors and became more involved in projects and initiatives in the hospital. I was doing

my preceptorship, and when the DPII was conceptualized and implemented, I was an observer, as my preceptor was the owner of the initiative. I observed how this process improvement was carried out, and I saw how leaders interacted with each other and the staff.

Then I was tasked to do another process improvement project for care coordination as a corporate directive. I saw personal growth as I became more confident in planning for process improvement initiatives and leading a group of staff from different disciplines as we started the multidisciplinary rounds. The trust given to me by the organization's leadership to lead the multidisciplinary rounds team gave me confidence to apply my learning in the DNP program. I have gained confidence in speaking in bigger groups and sharing my ideas with leaders. I have learned how to analyze data and information and look for opportunities for improvement and continuously make innovations.

The biggest challenge in completing this project was balancing time between school, work, and family. The hospital has been going through many changes, including a big change in the electronic health record, which required my membership on different committees. There were projects directed by our corporate office on which I have spent my time and energy. Completing this project was also affected by having to make requests for IRB approval, waiting for permission for access the data, and waiting for reports to be finalized by the quality improvement department. I spent much time learning statistics, and analyzing and interpreting the data was very challenging for me.

This DNP project has taught me that I should be focused on my goals and allot time to work on them because different responsibilities require time and energy. I have

realized that as an advanced practice nurse, I will be expected to lead projects that require my full attention and time. Most of all, this project renewed my vision of the nurse I wanted to become—a nurse who leads others in making nursing and the whole health care system better than when I first found it.

Summary

This DNP project was an evaluation of the DPII, which was implemented to lower the LOS of patients in a hospital in Northern California. The study showed there was a statistically significant reduction in the LOS one and two years following the implementation of the DPII. Although the findings showed statistical significance, the reduction of the LOS cannot be fully attributed to the DPII because other projects were implemented at the same time. Additionally, there were other changes that could have affected the findings.

The information obtained in this study can be used and applied in another hospital to see whether it will yield similar results. As recommended previously, further studies should look into the correlation between reduced LOS and the rate of readmissions as well as reduced LOS in relation to chronic conditions. Care coordination departments can look at this study to inform processes of improving discharge planning and reducing LOS.

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