

2021

Smoothing Patient Flow by Improving Bed Turnover Time

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Walden University

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Walden University

College of Nursing

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Carrie Percell

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Walden University
2021

Abstract

Smoothing Patient Flow by Improving Bed Turnover Time

by

Carrie Percell

MS, Walden University, 2014

AD, Thomas Nelson Community College, 1999

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

February 2021

Abstract

Bed Management Solutions (BMS) is a bed tracking system that provides real-time data into hospital activities, including admissions, transfers, discharges, bed turnover rates, and processing time frames. When BMS is used appropriately, it has the potential to improve bed turnover rates, reduce stress of clinical staff, improve patient satisfaction, and improve patients' well-being. Delays in bed turnover times can create overcrowding, extended wait times, bottlenecks, delays in patient care, and significant patient flow problems. The purpose of this DNP project was to develop a staff education program to answer the question if the implementation of an educational training program could improve staff's knowledge, skill, and practice in the baseline and proper use of BMS. Fox, Mazmanian, and Putnam's change and learning theory guided and supported this staff education project. A PowerPoint presentation was developed and presented to address the practice-focused question to improve bed turnover times, ultimately improving patient flow. The paired *t*-test compared pretest and posttest data before and after the training session, indicating a significant improvement in the 17 participants' knowledge. Pretest ($M=67.64$, $SD=10.91$) and posttest ($M=96.47$, $SD=6.06$). The findings indicate the posttest mean of 96.47 (96%) is statistically significantly higher than the pretest mean score of 67.6 (68%). The project has the potential for positive social change due to increased knowledge among staff; it is anticipated that there will be an improvement in the patients' and their families' hospital experiences and satisfaction scores. Patients' wait times will be decreased, and care will be delivered in a timelier manner.

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Dedication

First giving honor to God, who is the head of my life; he is my strong tower; he is my strength; he is my rock and salvation. "I can do all things through Christ which strengthens me" Philippians 4:13.

I would like to dedicate this project to my late brother Dwanne "Pop" Martin. I wish you here to witness this incredible moment; you would be proud. To my sons, Dontae and Wyatt, thank you for believing in me; you are my reasons and my motivation to reach my dreams. To my mother (Mollie), sisters (Tamar and Shawanda), and my best friends Angela and Billy, thank you for your steadfast love, support, and encouragement. To my daughter-in-law, Tatiana, thank you for the late-night talks, coffee, and shoulder to cry on when things didn't work out as they should.

To my beautiful grandchildren Aireona, Nyla, Elijah, and Kyra, this is for you. Let your dreams come true. Grandma loves you.

Finally, to my loving husband Wyatt, you have been my biggest supporter from the start; thanks for pushing me, supporting me, and loving me. When I threw in the towel, you picked it up, dusted it off, and gave it back. When I cried, you dried my tears; you prayed, pushed, and encouraged me to walk into what God has destined for my life. You have always supported my dreams, putting my dreams before your own, never complaining. Thank you, and I love you forever.

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Section 1: Nature of the Project

Introduction

Inpatient bed availability is a problem that can affect many hospitals. Extended wait times, overcrowding, and patient care delays may be a result of a lack of bed availability. Literature suggests when inpatient beds are not effectively managed, wait times for care are increased, and patient care is not delivered promptly (Cudney et al., 2019). Managing hospital beds is a critical component to improving patient care and sustaining continuous hospital throughput of patients (Schmidt et al., 2013). The lack of bed availability can lead to significant adverse effects, such as an increase in emergency department (ED) boarders, surgery cancellations, and poor patient outcomes (Vetteth & Arthofer, 2019). Patients face obstacles to fast and efficient care at all levels of their hospital stay, including receiving an inpatient bed when their ED treatment is complete, and they are ready for admission (Morley et al., 2018). Most notably, bed turnover times are a significant factor contributing to a lack of bed availability (Tortella et al., 2013).

This staff education project aimed to improve bed turnover times to smooth patient flow and improve patient outcomes at the project site by increasing nurses' and environmental management services (EMS) staffs' knowledge, skill, and practice with the use of a bed tracking tool called Bed Management Solution (BMS). The staff education project consists of a pretest, a 1-hour educational training session, a posttest, and a program evaluation following the training session. The potential positive social change implications of educating nursing and EMS staff on using BMS as a useful tool are improved bed turnover rates, reduced stress of clinical staff and non-clinical staff

members, improved patient satisfaction, and improved patient well-being. Section 1 discusses the problem statement, purpose, practice-focused question, nature of the project, and significance of the project.

Problem Statement

Inconsistencies noted during staff interactions and data collection process by the facilities management team on the use of BMS revealed inefficiencies in operations and a lack of knowledge, skill, and practice, delaying bed turnover times and preventing patients from moving from unit to unit without having to wait. The staff education project was implemented in a 465-bed hospital with 92 acute care beds in the Mid-Atlantic region on the East coast on the 21-bed acute inpatient medical/surgical unit. After reviewing the hospital's BMS data and determining inconsistencies in the bed turnover times, it was determined at that time the need for a staff education project. Bed turnover times are defined as getting a new patient into a bed or room as fast as possible after the previous patient has been discharged (Wilkins, 2017). According to Morley et al. (2018), when there is a delay in bed turnover, patients cannot receive the right care, at the right time, at the right level of care, inpatient length of stays are increased, and quality of care is decreased. It is vital when patients are not occupying beds; the beds are cleaned promptly and ready for the next patient (Wilkins, 2017). The national standard recommends bed turnover times range from 40 to 45 minutes from when a patient is discharged or transferred (Pyrek, 2015). The standard of practice (SOP) policy at the medical center indicates bed turnover times should range between 50 to 60 minutes. BMS data from the medical center indicate bed turnover times range from 1 minute to 12.25

hours; the discrepancy in bed turnover times supports the misuse and underuse of the BMS.

Inefficient processes, such as delay in bed turnover, can lead to extended wait times for inpatient beds, patient care delays, a decrease in patient and family satisfaction, and poor patient outcomes. Delays in bed-turnover times lead to delays in patient movement and patient care (Pellicone & Martocci, 2006). When patients are not in an inpatient bed, nurses are unable to provide quality health care promptly. The literature suggests there is a correlation between patient mortality rates and the lack of inpatient beds (Rojas-García et al., 2018). Thus, it is critical to implement a staff education project to improve nurses' and EMS staff's knowledge, skill, and practice on the use of BMS with the goal of improving bed turnover. Staff education is critical to patient flow improvements and generating a culture focused on creating seamless care transitions.

The significance of this doctoral project to the nursing practice includes decreasing wait times, improved patient care, patient and family satisfaction, and increase in patient outcomes. As reported by Vetteth & Arthofer (2019), lack of inpatient bed availability can lead to significant adverse effects, poor patient outcomes, and increased stress in clinical staff.

Purpose

The inconsistencies noted during the data collection process and staff interviews on the use of the BMS revealed inefficiencies in processes and a gap in knowledge, skill, and practice in the use of the BMS. To bridge the gap in knowledge, skill, and practice, I implemented an educational program to improve bed turnover times, which can

ultimately improve patient satisfaction, patient outcomes, and patient flow. BMS is a bed tracking system that provides real-time data into hospital activities, including admissions, transfers, and discharges (Abedian et al., 2018). Additionally, the bed tracking system provides data on bed turnover and processing time frames. Real-time notification of discharges and admissions results improves turnaround times and increased bed utilization (Health Information Technology, 2013).

The practice problem exists because bed turnover is not managed. Beds are not cleaned within the necessary time frame, such that patient demand is not being met, resulting in increased wait times, delays in patient care, and decreased patient and family satisfaction. Lack of bed availability produces significant patient flow problems, including extended wait times, delays in patient care, adverse patient outcomes, and decrease patient satisfaction (Van der Linden, et al., 2017). A pretest and posttest were used to determine if there would be an increase in nursing and EMS knowledge related to using BMS and bed turnover times. Post-education rounding was performed to determine an increase in skill and bed turnover times collected from the BMS to compare pre and post-implementation data to determine improvement in practice. The recommended time of 50 to 60 minutes in the SOP was compared to the new bed turnover time after the educational session. The practice-focused question for this DNP project was: Can an educational training session on the baseline and proper use of BMS improve knowledge, skill, and practice in the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction? Increasing the knowledge, skill, and practice of nurses and EMS staff with an educational project has

the potential to enhance the usage of BMS and integration into clinical practice, ultimately improving bed turnover times and meeting the national bed turnover standards of 40 to 45 minutes. Staff education plays a major role in achieving and delivering safe and effective quality healthcare. Educational programs present an opportunity to expand knowledge and increase job satisfaction, production, and employee retention (Sarff & O'Brien, 2020).

Nature of the Doctoral Project

The project evaluated the knowledge, skill, and practice of nurses, EMS, and inpatient ward clerks on the use of BMS to improve bed turnover times. The evidence to support the education project was obtained from Walden University's online databases. Peer-reviewed articles were obtained from CINAHL Plus with Full Text, Medline with Full Text, Ovid, and PubMed. The keywords and Boolean phrases used to search databases include bed turnover, patient flow, bed management system, bed management solutions, patient throughput, environmental management services, and bed cleaning. Other sources of evidence used included bed turnover times from BMS, SOP at the medical center, and National standards for bed turnover.

The staff education project is in alignment with the Walden University's staff education manual. The project consisted of a 1-hour educational training session on the correct usage of the BMS, including demonstration, return practice, pretest, posttest, and program evaluation survey following the educational training session. The pretest and posttest were used to measure the staff's knowledge. A program evaluation survey was used as an evaluation measure to determine the effectiveness of the education presented

during the training session. Several educational training sessions were conducted across all shifts to meet the staff's (including nursing, EMS, and inpatient ward clerks) needs and to ensure the doctoral project's success. In addition to ensuring sustainability and long-term impact, post-survey rounding was conducted to measure staff skills, allow associates a vehicle to voice concerns, and provide an opportunity for real-time feedback and performance coaching. Post education bed turnover data were collected from the BMS to evaluate the sustainability of the project and to measure practice. The purpose of the project was to improve bed turnover times by providing EMS, and nursing services increased knowledge, skill, and practice of BMS that will enhance the usage of BMS in clinical practice, ultimately improving bed turnover times, patient satisfaction, and patient outcomes.

Significance

The project affected stakeholders throughout the medical center. The educational training session required buy-in from the of Environmental Services, Chief Nurse of Acute Care Services, and nurse manager from the acute inpatient medical/surgical unit. Other stakeholders include acute inpatient nurses, EMS, and inpatient ward clerks. The project was implemented on the acute inpatient medical/surgical unit with 21 beds in a 465-bed hospital with 92 acute care beds on the East coast. To improve bed turnover times and success of the project, buy-in and support is needed from leadership and staff members from several departments (Tortella et al., 2013).

Improving bed turnover times will improve satisfaction among patients, their families, acute care inpatient nurses, EMS, physicians and ancillary staff. When beds are

turned over and ready for the next patient, healthcare facilities may see a decrease in wait times, improvement of timeliness and efficiency of care, and improved patient outcomes and experiences. The staff education project can potentially contribute to the nursing profession by increasing patient satisfaction and enhancing their patient experience, patient safety, and quality of care. The goal of the project was to improve nursing and EMS employees' knowledge, skill, and practice in using BMS. One of the vital components of BMS is the ability to assist health systems in improving access and delivering high-quality healthcare (Cudney et al., 2019) noted when bed turnover times are reduced, there is a reduction in patient wait times, improving patient satisfaction.

The project has implications for positive social change within the medical sector. Nurses and EMS services both play a critical role in operational efficiencies, including the day-to-day workflow and bed turnover times. EMS staff is critical to the organization as their role impacts patient care, patient outcomes, and patient satisfaction (Pyrek, 2015). According to Altman and Brinker (2016), nurses are in a prime position to create innovative ways to improve patient care and outcomes. Because of the project, it is anticipated there will be an improvement in the patients' and their families' hospital experiences and satisfaction scores and because patients' wait times will be decreased, care will be delivered in a timelier manner. Nurses will have increased knowledge of BMS, enabling them to provide better patient care at the right time, in the right place, at the right level of care. EMS staff will be more confident in their skills and practice after being educated on the use of BMS, which will promote more job satisfaction and fulfillment.

Summary

Inpatient bed availability is a problem that can affect many hospitals. Bed turnover times influence hospital bed utilization. When beds are not available, patients experience extended wait times, overcrowding of patients in the ED, and patient care delays. The inconsistencies noted during the data collection process by facility management and staff interactions on the use of the BMS revealed inefficiencies in processes and a gap in knowledge, skill, and practice in the use of the BMS. The national standard recommends bed turnover times ranging from 40 to 45 minutes from the time a patient is discharged or transferred (Pyrek, 2015). The SOP policy within the medical center indicates bed turnover times should range between 50 and 60 minutes. BMS data from the medical center indicate bed turnover times ranging from 1 minute to 12.25 hours; the discrepancy in bed turnover times indicates the misuse and underuse of the (BMS).

The purpose of the project was to improve bed turnover times by providing nursing and EMS education to increase their knowledge, skill, and practice of the use of BMS to improve the usage of the BMS in clinical practice. To bridge the gap in knowledge, skill, and practice, I implemented an educational program to enhance bed turnover times, which may ultimately improve patient satisfaction, patient outcomes, and patient flow.

The practice-focused question is: Can an educational training session on the baseline and proper use of BMS improve knowledge, skill, and practice in the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve

patient outcomes and patient satisfaction? The staff education project was implemented on a 21-bed acute inpatient medical/surgical unit in a 465-bed hospital with 92 acute care beds in the Mid-Atlantic region on the East coast. When beds are turned over and ready for the next patient, healthcare facilities may see a decrease in wait times, improvement of timeliness and efficiency of care, and improved patient outcomes and experiences.

The project has implications for positive social change within the medical sector. It was anticipated that there would be an improvement in the patients' and their families' hospital experiences and satisfaction scores. Patients' wait times will be decreased, and care will be delivered in a timelier manner.

Section 2: Background and Context

Introduction

Section 1 discussed the importance of implementing a staff education program that is anticipated to improve bed turnover times by providing EMS and acute care inpatient nursing services education to increase their knowledge, skill, and practice of using the BMS to improve usage of the BMS in clinical practice. Staff attitudes and perceptions were explored in order to determine their role in bed turnover times. Inpatient nurses are critical to bed turnover processes. If the nurse fails to notify EMS promptly that the patient has been discharged and the bed is empty and ready to be cleaned, then there is a delay in EMS staff members cleaning the room, making beds unavailable for the next patient. Nurses are critical in increasing efficiency, patient outcomes, and patient satisfaction (Needleman & Hassmiller, 2009). Nurses involved in direct patient care may have negative attitudes and poor behaviors related to bed turnover and bed occupancy. It has been reported that nurses at times do not report patient discharges for hours to avoid getting a new patient admission. Nurses also reported delaying notifying appropriate staff members of patients discharge due to the need to complete charting. According to Nicosia et al. (2018), nurses feel to increase efficiencies, hospital administrators are forcing them to push patients out to keep beds occupied and improve the hospitals' financial performance.

The practice problem was detected due to the noted inconsistencies during the data collection process and staff interactions on the use of the BMS, which revealed inefficiencies in processes and a gap in knowledge, skill, and practice in the use of the

BMS. The national standard recommends that bed turnover times range from 40 to 45 minutes from the time a patient is discharged or transferred (Pyrek, 2015). The SOP policy within the medical center indicates that bed turnover times should range between 50 and 60 minutes. BMS data from the medical center indicate that bed turnover times range from 1 minute to 12.25 hours; the discrepancy in bed turnover times suggests the misuse or underuse of the BMS. The practice-focused question is: Can an educational training session on the baseline and proper use of BMS improve knowledge, skills, and practice in the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction? The purpose of the project was to improve bed turnover times by providing nursing and EMS with increased knowledge, skill, and practice of BMS that will enhance the usage of BMS in clinical practice, ultimately improving bed turnover times. Section 2 discusses concepts, models, and theories, relevance to nursing practice, local background and context, and the role of the DNP student.

Concepts, Models, and Theories

Fox, Mazmanian, and Putnam's Change and Learning Theory

Improving practice requires staff to be purposefully involved in the change process. Fox, Mazmanian, and Putnam's change and learning theory concepts were used to guide and support this staff education project. The theory can be useful in healthcare to initiate organizational learning to develop organizational changes (Fox & Bennett, 1998). The change and learning theory is an approach of understanding and managing change, coupled with the focus on learning instead of teaching that leads to clinical practice

change (Fox & Bennett, 1998). Change and learning theory uses learning as a means for adjusting to or implementing change (Fox, Mazmanian, & Putnam, 1984). The theory can be useful in healthcare to initiate organizational learning to promote organizational changes (Fox & Bennett, 1998). The approach is also based on three interconnecting factors, including a self-directed component in which new knowledge is paired with the use of previous knowledge. The second factor includes learning in groups to improve interaction and collaboration, which helps shape change and practice. The third factor includes learning within the organization to create opportunities to create standards that govern practice. The use of the three components of the theory will allow me to focus on staff learning needs to evoke effective clinical practice change. The goal of using the theoretical framework is to improve knowledge, skill, and practice of the use of BMS, ultimately improving bed turnover times, decrease wait times, and patient outcomes.

Assumption

The assumption is that this staff education project can identify issues that contribute to delays in bed turnover times, causing an increase in wait times and poor patient outcomes. I assumed that if a staff education project is implemented on the use of BMS, bed turnover times will be decreased, patient satisfaction will be improved, inpatient throughput will be improved, bed capacity will be increased and nurses, and EMS staff will have an improved working relationship.

Relevance to Nursing Practice

Gaps in knowledge, skill, and practice exists among EMS and nursing staff on the baseline use of BMS, proper use of BMS, and how BMS can facilitate hospital-wide

patient flow. The practice problem exists because bed turnover is not managed, beds are not cleaned, and patient demand is not being met, resulting in the inability to optimize patient flow. Environmental management services (EMS) and nursing services are the heart of the organization, and the services they provide affect patients in one way or another (Burmhal, 2019). The nursing staff is challenged with providing timely access to care due to lack of bed availability causing a direct impact on patient satisfaction (Stowell et al., 2013). When beds are not available, patients are not delivered the right care, in the right place, at the right time (Rutherford et al., 2017). Many of the patients admitted to the medical facility are admitted emergently through the ED; delay in bed turnover times prevents admitted patients from moving to inpatient units due to lack of bed availability, increasing dissatisfaction with the care being delivered. Evidence shows when ED stays are prolonged, there are suboptimal patient outcomes to include higher mortality rates, a longer length of hospitalization, and a higher risk of acquiring infections (Lateef et al., 2017). Delays in receiving inpatient care prevent patients from receiving definitive antibiotic care, specialty care, meals, and chronic care medications at the right time for the right reason. Clean and ready beds are one of the hospital's most valuable resources for improving efficiencies that have the potential to reduce organizational cost (Ajami & Ketabi, 2007). Available patient beds can reduce wait times, in turn improving patient satisfaction. A robust bed management system can result in shorter bed turnover times and wait times for patients affording nurses the ability to care for patients instead of checking on available beds (Integrated Health Information Systems, 2019). The implementation of the staff education project will equip staff members with skills and

knowledge to effectively perform their duties to improve bed turnover times. The project will also enhance communication and collaboration among both services to improve bed turnover times, ultimately improving patient flow.

Local Background and Context

The setting of the staff education project was conducted at a 465-bed hospital with 92 acute care beds in the Mid-Atlantic region on the East coast with nurses and EMS staff working on a 21-bed acute inpatient medical/surgical unit. Bed turnover times are a significant problem at the medical center that required addressing. Turnover times are calculated from the time the patient leaves the room after discharge or transfer until the time the EMS team completes the terminal clean. Evidence shows that the national standard recommends that bed turnover times range from 40 to 45 minutes from the time the patient is discharged or transferred (Pyrek, 2015). The SOP policy at the medical center indicates that bed turnover times should range between 50 and 60 minutes. BMS data shows that bed turnover times at the medical center range from 1 minute to 12.25 hours; the discrepancy in bed turnover times supports the misuse, or underuse of the BMS. Delays in bed turnover times lead to delays in patient movement (Pellicone & Martocci, 2006). When beds are not cleaned, the next patient cannot be placed in the bed.

As patients move from unit to unit, overcrowding, extended wait times, bottlenecks, and lack of bed availability produce significant patient flow problems, including delays in patient care and adverse patient outcomes (Emergency Nurses Association, 2018). Improving patient flow and bed coordination is essential in increasing patient satisfaction and improving the quality of care (Van der Linden et al.,

2017). According to Bazzoli et al. (2006), improving throughput and management of capacity can help reduce bottlenecks, improve bed availability and improve transitions from unit to unit.

Definition of Terms

Bed management solution: BMS is a bed tracking system that provides real-time data into hospital activities, including admissions, transfers, and discharges. Additionally, the bed tracking system provides data on bed turnover and processing timeframes (Health Information Technology, 2013).

Bed turnover times are defined as getting a new patient into a bed or room as fast as possible after the previous patient has been discharged (Wilkins, 2017; Tortorella et al., 2013).

Environmental management services or housekeeper is the person responsible for sustaining a clean environment in hospitals by cleaning rooms, making beds, replenishing linen, and maintaining floors.

Patient flow is the ability of patient to move throughout the healthcare setting. Patient flow is also defined as the ability of the healthcare system to manage patients effectively and with minimal delays as patients move throughout the health system (Tlapa et al., 2020).

Xenex is a UV germ-zapping robot that eliminates harmful bacteria, viruses, and spores that cause hospital-acquired infections (HAIs) in the patient care areas ("Xenex Germ-Zapping", 2016).

Role of the DNP Student

I am the patient flow coordinator and bed control coordinator that serves on the patient flow committee. The goal of the patient flow committee is to collaborate with a multidisciplinary team to plan and implement new strategies to improve patient throughput throughout the medical center. During several patient flow meetings, one of the most common themes noted was a lack of available beds for ED and surgery admissions. I was asked by the environmental services chief officer about current bed turnover times due to the increase in patient volume, increase in ED wait times, and the inability of the EMS staff to manage bed turnover, making beds available when needed for an admission. COVID-19 pandemic which began December 31, 2019 has placed additional cleaning time to the bed turnover process at the medical center, adding 15 to 30 minutes to the cleaning process. EMS has been vital in keeping the facility clean and decontaminating, especially in-patient care areas in which aerosol-generated procedures are performed. During COVID-19, EMS staff members have shown how critical their roles are in turning rooms over rapidly and having them ready for the next patient. New procedures are in place to ensure rooms are cleaned and decontaminated according to industry and the Center for Disease Control and Prevention (CDC) standards. EMS staff members are now required to don (put on) and doff (take off) required personal protective equipment (PPE) before entering COVID-19 rooms. Before manually cleaning the room, EMS staff members must run the Xenex, a full spectrum disinfecting robot that eliminates harmful bacteria, viruses, and spores that cause hospital-acquired infections (HAIs) for 15 minutes before they can turnover the room for the next patient. I

implemented a staff education project to improve knowledge, skills, and practice in the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction. The additional cleaning time supports the need for staff education project. If staff members are provided knowledge, skill, and practice on the use of BMS; bed turnover times can be improved.

Summary

Evidence supports that effective and efficient bed coordination can improve patient satisfaction and the quality of healthcare delivered. Delays in bed turnover times lead to delays in patient movement (Pellicone & Martocci, 2006). When beds are not cleaned, the next patient cannot be placed in the bed, and patients experience delays in healthcare and possible adverse outcomes. Section 2 discussed the change and learning theory, evidence supporting relevance to nursing practice, and my role in implementing the staff education project. The practice-focused question is: Can an educational training session on the baseline and proper use of BMS improve knowledge, skill, and practice in the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction? Section 3 discusses the collection and analysis of evidence.

Section 3: Collection and Analysis of Evidence

Introduction

The project was designed in response to the discrepancies in bed turnover times and the inconsistencies in the use of BMS at the target medical center. Bed turnover can be improved by moving patients in and out of units efficiently to bring other patients into the unit or facility. Managing bed turnover can be a challenge for many organizations; the inability to have clean and ready beds for patients will often result in patients remaining in the ED because there are not enough beds available in the inpatient unit. Insufficient supply of beds puts a strain on acute care areas, including ED, medical/surgical, and intensive care unit (Bazzoli et al., 2006). Improving bed management will improve services being provided, enhancing the quality of care being delivered (Abedian et al., 2018).

The purpose of this staff education project was to close the gap in knowledge, skill, and practice of the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction. The staff education project addressed the inefficiencies and inconsistencies with bed turnover times and failure to appropriately use BMS eliminating patients having to wait on a clean and ready bed. Section 3 of the project explores the sources of evidence, steps to implementation, and analysis and synthesis used to support the staff education project.

Practice-Focused Question

The practice-focused question is: Can an educational training session on the baseline and proper use of BMS improve staff members knowledge, skill, and practice of

the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction? After a review of bed turnover data within the BMS, I determined inefficiencies and inconsistencies in bed turnover times, indicating a misuse or inappropriate use of the BMS preventing patients from moving from unit to unit without delays. The goal of this staff education project was to improve knowledge, skill, and practice of the use of BMS that ultimately improve bed turnover times, smooth patient flow, and improve patient outcomes and patient satisfaction.

Key aspects of this doctoral project are based on the national standard which recommends bed turnover times should range from 40 to 45 minutes from the time a patient is discharged or transferred (Pyrek, 2015). The SOP policy within the medical center indicates bed turnover times should range between 50 and 60 minutes. BMS data from the medical center indicate bed turnover times range from 1 minute to 12.25 hours; the discrepancy in bed turnover times supports the misuse, or underuse of the BMS.

Sources of Evidence

The sources of evidence to support the education project were obtained from Walden University's online databases. Peer-reviewed articles were obtained from CINAHL Plus with Full Text, Medline with Full Text, Ovid, and PubMed. The keywords and Boolean phrases used to search databases include *bed turnover*, *patient flow*, *bed management system*, *bed management solution*, *patient throughput*, *environmental services*, and *bed cleaning*. The literature review revealed valuable and relevant data related to the need for a staff education project to improve bed turnover times. Evidence was collected from the BMS electronic system within the medical center. Other sources

of evidence used included the medical center's SOP and National standards for bed turnover. The evaluation component included a pretest, posttest, post-education program evaluation survey, post-survey rounding, and post-education bed turnover data collection.

Pretest and posttest were used to measure new knowledge; program evaluation used as an evaluation measure to determine the effectiveness of the education, post-survey rounding to measure skills, obtain feedback and provide additional training and coaching as needed. Post education data collection were used to measure bed turnover times from BMS after training to evaluate practice and sustainability of the project. Assessing practice changes and ensuring sustainability can be an extensive and timely process; continued evaluation of the data is needed.

This staff education project is in alignment with the Walden University's staff education manual. The project consisted of a 1-hour educational training session on the correct usage of the BMS, including demonstration, return practice, pre-educational test, and posttest, and program evaluation following the educational training session. The pretest, posttest, and program evaluation were used as an evaluation measure to determine the effectiveness and validity of the education presented during the training session. Several educational training sessions was conducted across all shifts to meet the needs of the staff to ensure the success of the staff education project. In addition, to ensure sustainability and long-term impact, post-survey rounding was conducted to allow associates a vehicle to voice concerns, and an opportunity to provide real-time feedback, continued education, and performance coaching. Post education bed turnover data was collected from the BMS to evaluate the sustainability of the project.

Archival and Operational Data

The archival data comprised 6 months of bed turnover times collected from the BMS password-protected electronic database from the project site by the nurse manager of the Patient Flow department and provided to me. The report generated from BMS on bed turnover times describes aspects needed to determine how long it takes the bed to be turned over or cleaned including the time the bed was requested to be cleaned by nursing, the time EMS accepts the room/bed for cleaning, the time the room/bed was log as cleaning complete, the total time it took to clean the room/bed, and additional comments. The BMS report provides valuable, relevant, and reliable bed turnover data that cannot be manipulated or changed. There is no inherited limitation in the data. The initial data was needed to determine the gap in practice and to establish a baseline for bed turnover times. BMS is a dependable source of evidence that supports the purpose of my project, and the data collected provides a foundation for the need of a staff education project. The archival data showed that there was a significant problem with the use of BMS as represented by the bed turnover times ranging from 1 minute to 12.25 hours with the facility standard of 50 to 60 minutes to sufficiently turnover/clean a bed for the next patient. Archived data on bed turnover times were discussed with the chief officer of EMS in response to the inquiry on bed turnover times due to an increase in patient volume, increase in ED wait times, and the inability of the EMS to manage bed turnovers. Data from BMS showed a pattern of misuse and underuse of the BMS. After approval from Walden's University's Institutional Review Board (IRB), I obtained permission to collect operational data on bed turnover from the BMS password protected electronic

system. The data was de-identified and reviewed pre and post-implementation of the staff education project for comparison and to assist me in answering the practice question.

Participants

Seventeen members of the medical/surgical acute inpatient unit attended the educational sessions; participants included registered nurses, licensed practical nurses, EMS, and inpatient ward clerks. The participants were voluntarily recruited using a flyer created by me. Staff were selected based on their work assignment to the acute medical/surgical inpatient unit. Inpatient ward clerks were not initially included in the project; however, during implementation, it was noted that they play an integral role in the bed turnover process. The participants are all essential team members in the bed turnover process. Nurses, EMS, and inpatient ward clerks received the same training; the different disciplines needed to understand each other's roles and responsibilities in bed turnover. The practice focus question was the foundation for the project; can staff education improve knowledge, skill, and practice of nursing and EMS staff members on the use of BMS?

Procedures

This staff education project is in alignment with Walden University's staff education manual. The steps for developing this project included planning, implementation, and evaluation. Pretest, posttest, and 5-point Likert scale was created and used as an evaluation measure. The pretest was given to evaluate the staff's knowledge before the educational session. After each educational training session, a posttest was given to assess the impact of training on the staff's knowledge. A program

evaluation survey was given to evaluate the effectiveness and validity of the staff education project. In addition to ensuring sustainability and long-term impact, post-survey rounding was conducted weekly to measure the staff's skills. Rounding will continue monthly to allow associates a vehicle to voice concerns and provide real-time feedback, continued education, and performance coaching. Evidence was collected from BMS post-implementation to compare the facility's bed turnover times with previous bed turnover times, comparing to national turnover times and the medical centers' SOP, after the educational session to measure practice and show the project's sustainability.

Protections

This doctoral project adhered to the ethical requirements outlined in the staff education manual to include de-identifying the organization and maintaining the confidentiality of the organization's identity, complying with the organization's policies, refraining from collecting data on patients or patient's family members, and guaranteeing no proprietary or confidential information is disclosed in the doctoral project. The project adhered to the organization's policies and site IRB policy agreement. An IRB packet was submitted to the medical center requesting consent to implement the staff education project. Approval from Walden University (approval number 08-12-20-0298274) and the medical center was obtained before implementation, and data collection occurred. Upon approval from Walden University and approval from the medical center, bed turnover data were collected from the BMS password-protected electronic database. The data was placed in a sealed envelope and placed in a lock file cabinet designated by the medical center. The data was used to measure post-education bed turnover times. The participants

were voluntarily recruited from the 21-bed acute inpatient medical/surgical unit using a flyer created by me. The staff education project was implemented in a conference room setting and consisted of a pretest, 1-hour educational training session, posttest, and post-education program evaluation. The pretest, posttest, and program evaluation survey were administered with the use of paper and pencil. Staff participation was voluntary and not mandatory. No punitive action occurred for the lack of staff participation. Pretest, posttest, and program evaluation were de-identified using a 6-digit code known only to the participant to ensure anonymity and provide me the ability to compare pretest and posttest results. Pretest, posttest, and program evaluation surveys were placed in individual envelopes and placed on the participants' desk to complete. After completing the training sessions, the participants placed the completed pretest, posttest, and program evaluation surveys in the provided envelope in a basket in the room, all surveys sealed and locked in a file cabinet immediately after each training session until it was time to analyze the data. Pretest were placed in a designated envelope marked pretest and posttest and program evaluation placed in an enveloped marked posttest and evaluation. Several educational training sessions were conducted across all shifts to meet the staff's needs and to ensure success of the staff education project. The results of the project reported at an aggregate level.

Analysis and Synthesis

Descriptive statistics using Statistical Package of the Social Science (SPSS) software was used to analyze the pretest and posttest data along with providing a summary of results of the staff education project. A 5-point Likert scale was used to

analyze the post-education program evaluation survey results to determine the training program's effectiveness. Pretest and posttest data was analyzed by me using a paired *t*-test in SPSS to compare the participant's knowledge of BMS and determine an increase in knowledge among staff. The results of the surveys assisted in addressing the practice focus question providing data that can be used in the future to adapt new training programs for new hires on the use of BMS.

Summary

The purpose of the staff education project was to provide EMS, and nursing services increased knowledge, skill, and practice on the use of BMS to improve the usage of BMS in clinical practice, ultimately improving bed turnover times, improved patient flow, patient satisfaction, and patient outcomes. Creating and implementing this staff education project increased knowledge of nurses, EMS, and inpatient ward clerks. The increased knowledge will afford the staff an opportunity to effectively use BMS to improve bed turnover times ultimately improving patient flow. Reducing bed turnover times will improve patient flow throughout the healthcare organization but not until staff members are trained and have the skills required to use BMS (Tortella et al., 2013). Section 3 focused on sources of evidence, participants', data collection procedures, and methods used to analyze data. Section 4 describes the findings, implications, and recommendations of this staff education project.

Section 4: Findings and Recommendations

Introduction

Inpatient bed availability is a problem that can affect many hospitals. Bed turnover times influence hospital bed use. When beds are not available, patients experience extended wait times, overcrowding of patients in the ED, and patient care delays. The medical facilities' bed turnover times ranged from 1 minute to 12.25 minutes compared to national bed turnover standards of 40 to 45 minutes. The inconsistencies noted in bed turnover times during the data collection process revealed inefficiencies in processes and a gap in knowledge, skill, and practice in using BMS. The practice focus question asks: Can staff education improve the knowledge, skill, and practice of nursing and EMS staff members on the use of BMS?

This project was implemented on a 21-bed acute inpatient medical/surgical unit in a 465-bed hospital with 92 acute care beds on the East coast. The purpose of this staff education project was to educate staff members on the proper use and baseline use of BMS to determine if the education program can improve the staff's knowledge, skill, and practice; enhancing the use of the BMS tool ultimately improving bed turnover times, smoothing patient flow, and improve patient outcomes and patient satisfaction. This project promoted social change by providing nurses, EMS, and inpatient ward clerks with increased BMS knowledge, skill, and practice. Nurses can provide patient care at the right time, in the right place, at the right level of care. EMS and inpatient ward clerks feel more confident in their skills and practice, promoting job satisfaction and fulfillment. The project participants included 17 staff members from the acute inpatient medical/ surgical

unit. Participants included nurses, EMS, and inpatient ward clerks. The paired *t*-test in SPSS were used to analyze the pretest and posttest to determine results and answer the practice focus question. Anonymous post-education survey was given to participants to measure the effectiveness and validity of the project to include the staff's perspective, satisfaction, and self-confidence. Participants used the 5-point Likert scale to select their responses from 5 = strongly agree to 1= strongly disagree. The Likert scale were analyzed using the percentage of participants who agreed compared to participants who disagreed. In section 4, I provide a summary of findings and implications, recommendations, strengths and limitation of the project.

Findings and Implications

For this study, several educational sessions were held in a conference room setting. Educational sessions were limited to 10 participants to ensure Coronavirus (COVID-19) pandemic guidelines were followed. The training sessions consisted of a pretest, PowerPoint presentation, demonstration, return practice, posttest, and program evaluation. The same anonymous 10 question pretest and posttest were administered to the same 17 participants. A pretest was issued before the educational session to assess existing knowledge. Posttest helped to determine if new or increased knowledge was gained. I compared pretest and posttest scores and determined that both clinical and non-clinical staff members gained knowledge in the use of BMS. All 17 participants improved their overall test scores on the posttest after attending the staff education training session. Post-education survey was given to participants to measure their perspective, satisfaction, and self-confidence to measure the effectiveness and validity of the project. I performed

post-survey rounding allowing participants a vehicle to voice concerns, provide real-time feedback, and determine if their skills improved in the use of BMS. Post education data were collected to measure bed turnover times to determine improvement in practice and to evaluate the sustainability of the project. This staff education project successfully increased knowledge among staff members on the use of BMS at the medical center. After the implementation of the project, staff begin to use the acquired BMS training.

The results of the pretest and posttest data are shown in table 1. Seventeen participants participated in the 10-question pretest and posttest (Appendices A). The results of the pretest ranged from the lowest score of 50% to the highest score of 90%. The pretest results supported the assessment that staff members on the acute medical/surgical lacked baseline knowledge on the use of BMS. Posttest were administered after implementation of the educational training session. Posttest results ranged from 80% to 100%. A significant difference was evident between the pretest and posttest results showing a statistically significant difference between pretest and posttest scores with pretest score of 68% and posttest score of 96%. The posttest results show staff education has a significant effect in enhancing the staff's knowledge of BMS that can ultimately improve patient satisfaction, patient outcomes, and patient flow.

Table 1*Participant's Pretest and Posttest Score Comparison*

Participant number	Pretest score	Posttest score
Participant 1	50%	90%
Participant 2	70%	100%
Participant 3	80%	90%
Participant 4	60%	100%
Participant 5	60%	90%
Participant 6	60%	90%
Participant 7	70%	100%
Participant 8	90%	100%
Participant 9	70%	100%
Participant 10	70%	100%
Participant 11	60%	80%
Participant 12	50%	100%
Participant 13	70%	100%
Participant 14	80%	100%
Participant 15	80%	100%
Participant 16	60%	100%
Participant 17	70%	100%
Test score average	68%	96%

Table 2 displays the results of the paired samples *t*-test. A paired sample *t*-test was conducted using SPSS software to compare the results of pretest and posttest data completed by 17 participants before and after an education training session. Pretest ($M=67.64$, $SD=10.91$) and posttest ($M= 96.47$, $SD =6.06$). The findings indicate the posttest mean of 96.47 (96%) is statistically significantly higher than the pretest score mean of 67.6 (68%). The data supported the need for a staff education project to improve knowledge on the use of BMS to improve bed turnover times.

Table 2*Paired Sample Statistics*

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Total pretest score	0.676471	17	0.109141	0.0264706
Total posttest score	0.964706	17	0.0606339	0.0147059

Table 3 displays the results of the pretest and posttest comparison per question. The pretest and posttest score comparison demonstrates how the staff members scored pretest and posttest for each question. Questions 1, 2, and 3 on the pretest showed staff members lacked basic knowledge of BMS and bed turnover. Posttest indicated the staff showed sufficient knowledge of patient flow for questions 8, 9, and 10. On questions 8 and 9 of the pretest and posttest, all 17 staff members got both questions right. The difference between the pretest and posttest questions showed a substantial increase in questions 1, 2, 3, and 6, which was noted after implementing the staff education program.

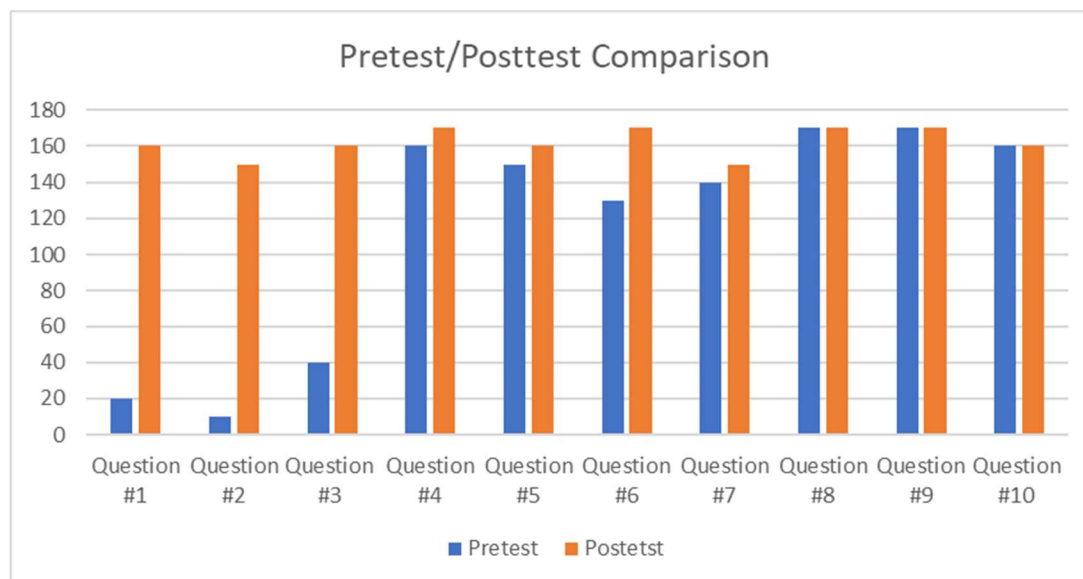
Table 3*Pretest/Posttest Comparison*

Table 4 displays the results of the staff education survey. The 5-point Likert scale survey (Appendices C) were used to evaluate the education program presented by me. The questionnaire was not used to assess participants knowledge but to assess the staff's perspective, satisfaction, and self-confidence of the educational program. Participants used the 5-point Likert scale to select their responses from 5 = strongly agree to 1 = strongly disagree. The Likert scale was analyzed using the percentage of participants who agreed compared to participants who disagreed. The 5-point Likert scale showed the staff agreed and strongly agreed with the program. The post-survey results will assist in identifying needed training areas for future training classes.

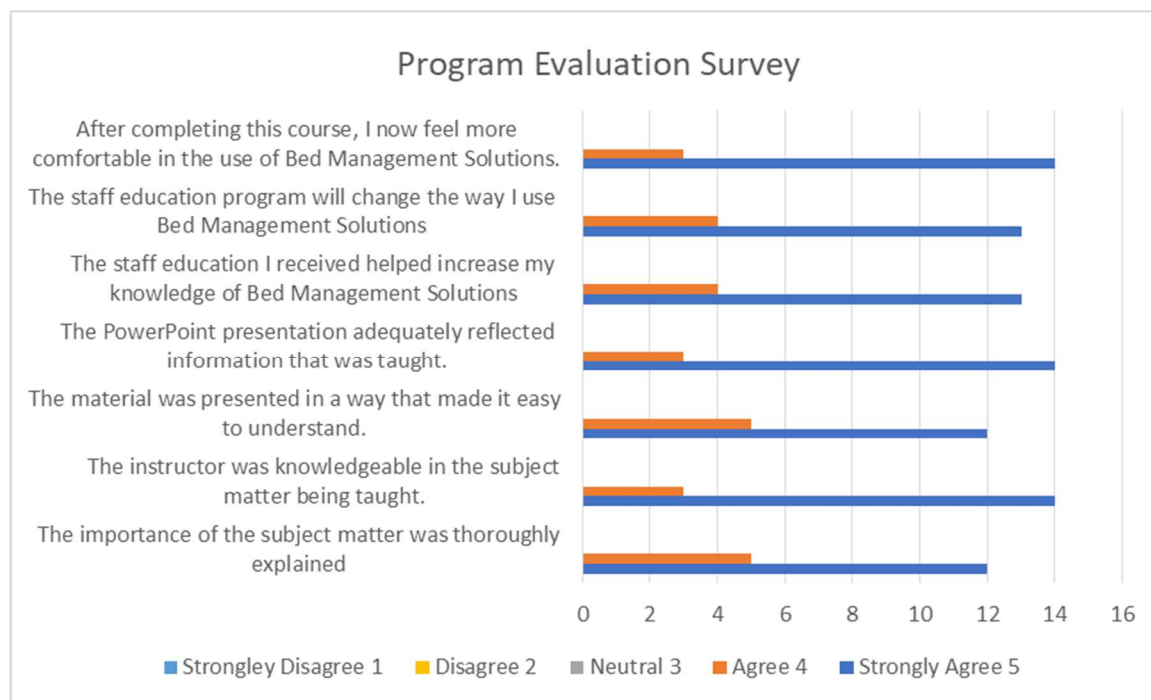
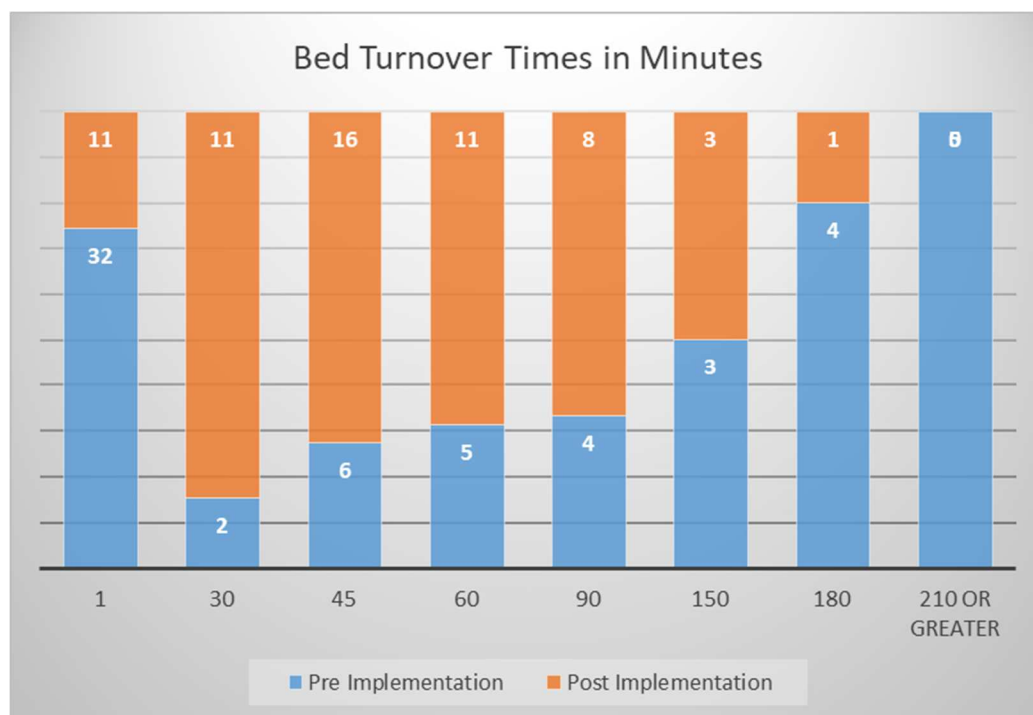
Table 4*Program Evaluation Survey*

Table 5 displays the pre-implementation and post-implementation bed turnover time's data analysis. A difference was noted between the pre and post-implementation bed turnover data. The difference was expected due to increase in knowledge and awareness post implementation of the staff education project. The most remarkable improvement was noted in the use of BMS. It was noted that staff members were using BMS, and the number of instances of 0 to 1 minute had decreased to 11 occurrences from 32 occurrences. The 0 to 1 minute time frame indicates a misuse of BMS. Before implementing the staff education program, several staff members did not have access or did not know how to use BMS properly. Supervisors would manually update BMS, indicating the bed was clean and ready for the next patient.

A total of 61-bed turnover records was reviewed and analyzed pre and post-implementation of the BMS staff education program. Bed turnover time frames pre-implementation ranged from 1 minute to 735 minutes (12.25 hours). Post implementation turnover times ranged from 1 minute to 180 minutes (3.5 hours). I excluded 1 minute bed turnover time frames to analyze valid bed turnover time frames. Pre-implementation bed turnover times ranged from 30 minutes to 735 minutes (12.25 hours). Post-implementation bed turnover times ranged from 30 minutes to 210 minutes (3.5 hours). Data analysis showed marked improvement in bed turnover time frames. The goal is to have bed turnover times meet the National bed turnover standard time frame of 40 to 45 minutes and to have no occurrences of 0 to 1 minute bed turnover times. However, there was noted improvement in the use of BMS, indicating an improvement in skill and practice.

Table 5*Bed Turnover Times in Minutes***Recommendations**

Staff education and training are among the most valuable resources an organization can offer its staff. Staff education improves knowledge and skills, which allow staff members to perform efficiently and effectively, improving patient outcomes. In this project, education and training provided each discipline with enhanced knowledge and skills to promote change at the medical center. Nurses, EMS, and inpatient ward clerks all have a responsibility in improving bed turnover, improving patient outcomes, and improving patient flow. The success of the project requires continued collaboration and communication among staff members. The focus of this project was to improve

knowledge, skill, and practice among staff by implementing a staff education program. The staff education project on BMS showed how a well-developed staff education program can improve knowledge, skill, and practice, ultimately improving bed turnover times. The results of the statistical data showed how the project enhanced knowledge among all staff members. The first recommendation is to continue using the BMS staff education program to educate nurses, EMS, and inpatient ward clerks throughout the acute inpatient units at the project site. The second recommendation is to integrate the program into the new hire process so staff members can gain the needed knowledge and skill required to perform their jobs, ultimately improving patient experiences.

Strengths and Limitations of the Project

The program had several strengths to include unwavering support from the medical center's leadership team. Staff support, excitement and their willingness to participate in the project were also vital to the project's success. Staff members played a significant role in determining the effectiveness of the project. Another strength was the collaboration with the inpatient ward clerks and how they noted the importance of their role in the bed turnover process. The ward clerks shared their expertise and workflow regarding bed turnover. They inquired if they could volunteer to participate in the project. The results of the program showed the success of the project with improved knowledge, skill, and practice among participants in the use of BMS. The outcome of the staff education was positive; one of the project's limitations was the small sample size of 17 participants—another limitation was the project was restricted to one acute inpatient unit. Recommendations are to extend the project to other inpatient units for more robust results

and greater project success. Additional identified limitations of the project were the time constraint and limited time to collect post-implementation bed turnover data to compare with previous data. A large amount of time was wasted waiting on the project site to decide if the staff education project was deemed research study or quality improvement project. I will continue to perform post-survey rounding and collect post-implementation bed turnover data from BMS to evaluate the project's sustainability.

Section 5: Dissemination Plan

Introduction

The practice problem exists within organizations because bed turnover is not managed; beds are not cleaned within the necessary time frame. Patient demand is not being met, resulting in increased wait times, patient care delays, and decreased patient and family satisfaction. The targeted audience for this DNP staff education program included clinical nurses and non-clinical EMS staff. The project was disseminated on the 21-bed acute medical/surgical unit by PowerPoint presentation to reach the target audience. The results were shared with the leaders of the acute medical/surgical and EMS at the project site. I am scheduled to share the results with the executive leadership team in February 2021 at the quality management quarterly meeting. The goal is to disseminate this project to other acute inpatient units – a win-win for the organization – and have the project as part of new hire orientation. The doctoral project findings will also be disseminated through a poster presentation at the yearly Veterans Integrated Service Networks patient flow and transfer center conference. The results of the program support the use of staff education as a means to improve knowledge, skill, and practice that can contribute to the overall effectiveness of the organization and better quality of care for patients.

Analysis of Self

Nurses play an integral role in improving health outcomes. Staff education plays an essential role in achieving the mission and vision of the organization. This project revealed how vital the DNP role is in staff development. Staff development is critical to

staff morale, employee retention, efficiency, and patient satisfaction. This DNP project contributed to my awareness of the need for continued staff education that promotes staff development and increased staff knowledge. As a lifelong learner, this project allowed me an opportunity to collaborate with clinical and non-clinical employees, providing education to improve knowledge, skill, and practice that will impact patient care, patient satisfaction, and staff fulfillment. I gained and shared knowledge throughout the completion of the staff education project. The DNP project increased my confidence in planning, implementing, and evaluating staff education programs. Challenges with my site IRB was a significant contributor to the delay in the implementation of the staff education project. The tedious IRB process helped me develop professionally and personally; I learned patience is a virtue, and you can't rush the process. I also learned how critical the IRB process is to the development of the DNP prepared nurse.

Summary

Patient flow represents the ability to serve patients quickly and efficiently as they transition through the health system from service to service. Hospitals can improve efficiencies by increasing patient throughput. Delays in bed turnover, overcrowding, extended wait times for care and bottlenecks, produces significant patient flow problems and delays in care. In a health system with a reliable, effective, and efficient patient flow program, patients transition through the health system with minimal delays, positive patient outcomes, and patient satisfaction. Staff Education plays an essential role in achieving the organization's vision and mission. Staff development through education can improve skills, knowledge, and practice, enhancing the efficiency of the staff and

organization. The implementation of this staff education project to improve bed turnover times showed promise in improving patient outcomes, patient satisfaction, and improved patient flow.

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Appendix A: BMS Pretest/Posttest

Test Questions

Please choose the correct answer

1. Which description best describes the term BMS?
 - a) Bed Management Solution
 - b) Bed Model System
 - c) Bed Management System
 - d) Bed Making System

2. What is the average time it takes to clean a bed?
 - a) 30 Minutes
 - b) 50 Minutes
 - c) 75 Minutes
 - d) 40 Minutes

3. What is the best description that best characterizes bed turnover?
 - a) The time it takes the Environmental Management Services team to clean the room
 - b) The time between one patient discharge and other another patient's admission
 - c) The delay in a getting a new patient in the bed
 - d) Getting a new patient into a room as fast as possible after the previous patient is discharged

4. True or False
Delays in bed turnover times lead to delays in patient movement.

5. What is the best description that best characterizes BMS?
 - a) Is a bed tracking system
 - b) Provides data on bed turnover and processing times
 - c) Tracks admissions, transfers, and discharges
 - d) All of the above

6. What is the direct impact of Inpatient beds not being clean and ready for patient admissions?
 - a) Patients don't mind waiting for care no impact
 - b) Delay in patient care and patients are happy with waiting
 - c) Patient and family dissatisfaction with nursing care
 - d) Patients don't receive the right care at the right time

7. True or False
Available patient beds can increase wait times, in turn, improved patient satisfaction.

8. The lack of bed availability can lead to:
 - a) Emergency Department boarders
 - b) Surgery Cancellations
 - c) Poor Patient Outcomes
 - d) All of the above

9. True or False

When beds are turned over and ready for the next patient, facilities can see a decrease in wait times, improved patient outcomes and patient experiences.

10. True or False

Clean and ready beds is not one of the hospital's most valuable resources for improving efficiencies that have the potential to reduce organizational cost.

Appendix B: BMS Answer Key Pretest/Posttest

BMS Answer Key

1. A
2. B
3. A
4. T
5. D
6. D
7. F
8. D
9. T
10. F

Appendix C: BMS Staff Education Program Evaluation

STAFF EDUCATION QUESTIONNAIRE

Please rate the following information on a scale of 1 to 5, with 5 being “strongly agree”, 4 “agree”, 3 “neutral”, 2 “disagree” and 1 being “strongly disagree”.

1. The importance of the subject matter was thoroughly explained.

1	2	3	4	5
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2. The instructor was knowledgeable in the subject matter being taught.

1	2	3	4	5
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3. The material was presented in a way that made it easy to understand.

1	2	3	4	5
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4. The PowerPoint presentation adequately reflected information that was taught.

1	2	3	4	5
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5. The staff education I received helped increase my knowledge of Bed Management Solutions.

1	2	3	4	5
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6. The staff education program will change the way I use Bed Management Solutions.

1	2	3	4	5
---	---	---	---	---

7. After completing this course, I now feel more comfortable in the use of Bed Management Solutions.

1	2	3	4	5
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Are there any comments or suggestions you would like to add about the training course that would make it better?

What part of the training did you enjoy the most?

What part of the training did you enjoy the least?

Appendix D: Staff Handout Bed Turnover Workflow

Bed Turnover Workflow**Nurses Role**

- Discharge orders are written
- Patient is ready for discharge/pick up
- Nurse discharges patient
- Nurses gives patient the orange discharge card
- Nurse strips bed and perform Vocera broadcast: stating bed number and room has been stripped and ready to be cleaned; notifying all parties including EMS Staff

MSA Role

- Patients hands the orange discharge card to MSA
- Patient leaves the unit
- MSA removes patient from the Vista computer system
- EMS may also be notified verbally if the Vocera broadcast doesn't occur by MSA staff
(AVOID THIS METHOD).

EMS Role

- EMS logs into BMS and starts the cleaning process
- Accepts bed for cleaning through BMS EMS Portal when the bed is ready to be cleaned
- Clean room per facility protocol
- Return to BMS immediately and enter bed cleaning complete