

Seattle University

ScholarWorks @ SeattleU

Doctor of Nursing Practice Projects

College of Nursing

2024

Implementing Team-Based and Virtual Nursing Models to Improve Achievement of Quadruple Aims

Bedane Geleta

Follow this and additional works at: <https://scholarworks.seattleu.edu/dnp-projects>

PROJECT TITLE:

**Implementing Team-Based and Virtual Nursing Models to Improve Achievement of
Quadruple Aims**

Bedane Geleta BSN RN, MSN

A DNP Project submitted in partial fulfillment of the requirements for the degree of

Doctor of Nursing Practice

Seattle University College of Nursing

Seattle, Washington

2024

Approved by: Bonnie N Zaver PhD

Date: 6/5/2024

Chairperson: Bonnie Bowie: PhD, MBA, RN, FAAN

Approved by: Renee Rassilyer-Bomers

Date: 6/5/2024

Reader: Renee Rassilyer- Bomers, DNP, CMSRN, RN-BC, FAAN

Abstract

Background: The COVID-19 pandemic increased the utilization of virtual care delivery. Virtual care modalities create accessible communication chains, promote team collaboration, and access to evidence-based resources. The virtual care model can also enhance care delivery and patient outcomes and reduce hospital-acquired conditions. The purpose of this study was to compare patient outcomes for care as usual (RN/CNA model) with a care model where virtual nurses are added to the care team on an acute care unit.

Methods: This quality improvement project utilized pre- and post-intervention analysis of inpatient falls and expected and observed length of hospital stay data collected from Press Ganey. The proposed intervention revises the current nursing care model to a team-based and virtual nursing model that includes bedside nurses, virtual nurses, nursing assistants, and nurse technicians. The existing model uses a ratio of 1 registered nurse to 4 patients and one nursing assistant per 12 patients. The proposed care mode pairs one nurse and one nursing assistant with six patients. In addition, two virtual nurses are assigned to 12 to 15 patients during the day and up to 30 patients at night. The virtual nurses work 12 hours to promote team collaboration with the 12-hour shift hospital-based staff.

Results: An independent t-test indicated that there is no statistically significant difference between observed and expected length of stay between care as usual and the addition of a virtual nurse to the team-based model. A run chart was conducted to determine whether patient fall rates changed during pre- and post-intervention. The analysis indicated that there is no difference in patient fall rates.

Conclusion: The integration of technology plays an essential role in improving care outcomes and organizational performance. This study shows that there was no significant difference in inpatient falls observed and expected length of stay. Since virtual nursing is a new care model, longitudinal studies are needed to follow up on the results and nurse satisfaction.

Introduction and Background

The 2020 global health crisis changed the healthcare environment considerably and profoundly affected the nursing profession. The COVID-19 pandemic has amplified problems in the healthcare system, including unprecedented workloads, challenges to access resources and care provision processes. One of the changes in the care provision process was the utilization of telehealth or virtual care delivery. The utilization of telehealth and virtual care modalities peaked beyond what anyone had imagined after COVID-19 social distancing regulations. Virtual care modalities allow access to critical health services by enabling communication between healthcare providers and patients while allowing providers to remotely monitor conditions using synchronous, real-time modalities via digital devices (Demaerschalk et al., 2022). Among 2,923 hospitals in the US, around 73% of hospitals had at least one telehealth or virtual capability, and more than half of these hospitals adopted telehealth consultation services to treat acute medical conditions (Gaziel-Yablowitz et al., 2021). That indicated that virtual care is used to enhance care and coordinate care across the continuum to improve health outcomes, reduce hospital stays, and reduce health care costs (Chen et al., 2021; Demaerschalk et al., 2022).

Most healthcare organizations utilize various resources to improve the achievement of quadruple aims by enhancing caregivers' ability to deliver evidence-based care (Awad et al., 2021). Commonly utilized methods of achieving quadruple aims are the use of new healthcare technology and evidence-based findings (Arnetz et al., 2020); Ekeleme et al., 202). The integration of virtual care has proven to be a method of improving patient satisfaction, health outcomes, organizational performance, and cost reduction, as well as improving the professional satisfaction of healthcare providers (Bearnese et al., 2021). The virtual caregiving process can promote interdisciplinary collaboration and resource utilization, which improves the ability to

deliver high-quality and effective care (Teles et al., 2023). High-quality care can promote patient safety and health outcomes.

However, the integration of new virtual technology and evidence-based findings into clinical practice is often fragmented and may not be easily accessed by caregivers. This gap can affect caregivers' ability to deliver high-quality care and collaborate with interdisciplinary teams (Kern et al., 2019). Lack of effective interdisciplinary team collaboration can negatively impact patient outcomes and organizational performance. Implementing team-based nursing can help promote interdisciplinary collaboration by setting common goals as a team instead of working individually to meet patient needs and deliver high-quality care in a timely manner (Trepanier et al., 2023; Will et al., 2019).

A new approach to a team care delivery model is the addition of virtual nursing, where the virtual clinician assists patients who do not need hands-on care. Virtual nursing is when qualified nurses provide non-hands-on patient care, monitoring, and education using advanced technology from various locations (Beckett et al., 2021; Russell, 2023; Schuelke et al., 2019). Some of the non-hands-on services include complete admission and discharge questionnaires, patient education, sitter or supervision, creating and modifying care plans, staff mentoring, prioritizing care delivery, and consultation (Beckett et al., 2021; Russell et al., 2023; Trepanier et al., 2023). Utilizing a virtually integrated care model can allow bringing experienced nurses to patient rooms remotely with the assistance of technology (Schuelke et al., 2019). This model allows virtual nurses to monitor the care process while interacting with the nurses and patients in real time. Close monitoring can ensure the patient's safety and the nurses' professional integrity (Trepanier et al. (2023).

The virtual model also allows experienced nurses to oversee care provision processes to provide real-time monitoring, allowing bedside nurses to access best practices and organizational policies or resources (Schuelke et al., 2019; Trepanier et al. (2023). Increasing access to best practice resources can ensure the delivery of quality care while promoting a collaborative and positive environment for the patients and nursing staff (Trepanier et al., 2023). Collaboration helps to mitigate complex patient care, which improves patient outcomes and reduces hospital-acquired complications (Skolka et al., 2023).

American Association of Critical Nurses created "The Nurse Staffing Think Tank" "tribrid" to promote quality of care and address the staffing crisis by integrating virtual care technology. This care provision model aims to integrate in-person care delivery with technology-assisted virtual care delivery, education, staff mentoring, and monitoring of clinical prognosis (American Association of Critical Nurses, 2023). Integrating technology improves health outcomes by assisting nurses in mitigating critical thinking and reasoning when dealing with complex medical conditions. Effective clinical reasoning can help to deliver high-quality care, which improves health outcomes while reducing healthcare expenditures (Arabi et al., 2021). This approach facilitates proper resource allocation and utilization since it improves nurses' ability to navigate organizational resources and use evidence-based findings (Skolka et al., 2023).

Patient-centered care is key to high-quality and evidence-based care (Park et al., 2022). The treatment paradigm continuously shifting from disease management to a patient-centered approach, increasing patient engagement in care plans and identifying needs and preferences (Siddiqui et al., 2020). Utilizing virtual technology allows for conducting a thorough assessment of patient's needs, values, and preferences to integrate patient values into all clinical decisions,

which promotes positive hospital experiences and adherence to the treatment regimen (Park et al., 2022).

Patient safety is a crucial component of healthcare systems that includes avoiding, preventing, and ameliorating adverse outcomes or injuries from caregiving processes. Utilizing current and relevant healthcare technology has opened new possibilities for improving patient safety (Borycki & Kushniruk, 2023). The safety and health outcomes could be ensured through safety alerts, clinical flags or reminders, better tracking and reporting of consultations, and diagnosing complex clinical cases by promoting access to organizational resources (Kim & Seomun, 2023). Virtual technology presents numerous opportunities for improving and transforming healthcare, which includes reducing human errors, improving clinical outcomes, care coordination, practice efficiencies, and tracking data over time (Awad et al., 2021).

The use of virtual nursing also facilitates access to resources, which enhances care delivery and reduces the occurrences of hospital-acquired complications (Borycki & Kushniruk, 2023). Inpatient falls continue to cause serious patient safety problems, leading to minor to major trauma or injury (Woltsche et al., 2022). Annually, up to one million falls occur in the United States of America in hospital settings (Woltsche et al., 2022). Approximately 30% of falls result in mild to moderate injury, and 6% of falls result in serious injuries, which include death (Skolka et al., 2023). Studies have demonstrated that virtual monitoring of patients at risk of falls is an effective prevention strategy and reduces hospital-acquired complications (Skolka et al., 2023; Woltsche et al., 2022). Integrating the team-based nursing model reduces workload by delegating and creating shared responsibility between virtual nurses, nursing assistants, and nurse technicians (Russell, 2023). Reducing workload enables nurses to provide compassionate, effective, and personalized care, which improves desirable patient outcomes such as improved

pain management, reduced falls, length of hospital stays, medical errors, and the use of chemical and physical restraints compared with other nursing care models (Beckett et al., 2021; Trepanier et al., 2023). A collaborative and compassionate care environment improves patient satisfaction, adherence to treatment regimens, and clinical outcomes while increasing caregivers' professional satisfaction (Malenfant et al., 2022).

The utilization of virtual nurses helps to improve health outcomes by allowing experienced virtual nurses to mentor bedside nurses, monitor patient progress, and promptly notify providers (Russell, 2023). Early notification and treatment initiation reduce mortality and morbidity rates (Beckett et al., 2021). For instance, early sepsis screening and notification improves care delivery, reduces patient transfer to the Intensive Care Unit (ICU), and decreases mortality rates (Arabi et al., 2021). Effective treatment and collaboration can help reduce hospital-acquired complications like falls and the length of hospital stays (Russell, 2023).

Okoli et al. (2020) found that insufficient supportive resources could affect patient health outcomes, hospital experiences, and nursing staff professional satisfaction. This can hinder the ability to provide high-quality, personalized, and culturally appropriate care (Lluch et al., 2022; Martin, 2022). Creating strategies for workload reduction and team collaboration is crucial to reducing hospital-associated complications such as medical errors, falls, and failure to recognize changes in patient conditions (Park et al., 2022; Perez-Garcia et al., 2021). Integrating team-based and virtual nursing helps address the gaps, which leads to improving health outcomes and organizational performance by enhancing the ability to utilize evidence-based findings to improve the quality of care by adhering to quality benchmarks. Although there is some evidence suggesting the benefits of virtual nursing on job satisfaction and patient outcomes, what is needed now are studies that look specifically at the effects of virtual nursing. This quality

improvement project helps to identify the benefits of team-based and virtual nursing models on the care provision process and organizational performances. Thus, the aim of this project was to examine whether utilizing the addition of virtual nursing improves (1) inpatient falls and (2) reduces expected and observed length of stays on an inpatient nursing unit.

Method

Design

This quality improvement project utilized pre- and post-intervention analysis of the inpatient fall data and expected and observed length of stay data collected from Press Ganey in a telemetry unit in a community-based hospital. The pre-and post-intervention data was used to determine whether this nursing model improved health outcomes and organizational productivity.

Ethical considerations

The Providence Swedish Human Research Protection Program (HRPP) determined that this clinical inquiry project does not meet the federal regulation's definition of research. Therefore, an Institutional Review Board (IRB) review was not required. The utilization of team-based and virtual nursing models was explained to the patient and their family or guardians upon admission to the telemetry unit.

Setting and Participants

This project has been implemented in a telemetry unit within a 625-bed hospital serving the Seattle metropolitan area. A surgical telemetry unit is a 30-bed unit serving patients with acute medication conditions who require close and extensive monitoring but are not sick enough to be admitted to intensive care or no longer need full intensive care. The participants of this project will include patients, patients' families, nurses, nurse technicians, nurse assistants, nurse educators, charge nurses or unit leaders, and other caregivers who directly work in the clinical

environment. All telemetry unit clinical caregivers are part of this quality improvement project since the unit changed the practice system to a team-based and virtual nursing model.

Intervention

The proposed intervention revises the current nursing care model to a team-based and collaborative care model that includes bedside nurses, virtual nurses, nursing assistants, and technicians. The existing model uses a ratio of 1 registered nurse to 4 patients and one nursing assistant per 12 patients. The proposed care model will pair one nurse and one nursing assistant with six patients. In addition, two virtual nurses will be assigned to 12 to 15 patients during the day and up to 30 patients at night. The virtual nurses will work 12 hours, ensuring continuity of care and team collaboration with the 12-hour shift hospital-based staff. The virtual nurses will be responsible for the following task areas: admission and discharge education, care coordination, patient education, pre-operative checklists, medication reconciliation, monitoring patient prognoses and report changes, and patient rounding. The bedside nurses will be responsible for the following nursing areas: compressive patient assessment, assisting patients with daily activities, administering medications, providing nursing treatment or care, creating a care plan, monitoring patient prognosis, collaborating with providers and other teams, and conducting evaluation as needed. Nursing assistants are expected to work collaboratively with nurses while assisting patients in daily living, such as feeding, bathing and dressing, repositioning, ambulation, safety rounds, answering call lights, and other tasks delegated by the nurse.

Inclusion Criteria

Inclusion criteria are those patients who were admitted to the telemetry unit between date and date.

Measurements

Health Outcomes

This project will evaluate health outcomes by patient fall rates. Patient falls are reported using the Unusual Occurrence Report platform. Fall data are tracked monthly by unit. The evaluation includes assisted and unassisted falls or unwitnessed falls.

Stewardship

The stewardship will be measured by the patient's length of hospital stay, which is tracked by number of days expected versus observed. Length of stay helps to assess the improvement of unit performance and resource utilization.

Data Collection

The Press Ganey platform was utilized in the pre-intervention and post-intervention data collection. Press Ganey platform allowed access to aggregated and de-identified data. PressGaney's data collection system has also been approved as reliable by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). Permission to access Press Ganey platforms was obtained through communicating with quality improvement teams, the clinical program manager, and the unit manager. The quality improvement team retrieved data from Press Ganey, the Providence Swedish Power BI platform. This data is stored on a password-secured device.

Aim	Outcome	Measure	Timeframe
1- Reduce Inpatient fall	Health Outcome	Inpatient fall rates	The number of patients' fall rates would be collected three months before and after the intervention.
2- Reduce the length of hospital stay	Stewardship	Observed and expected length of hospital stay data	The data would be collected three months before and after the intervention.

Figure 1: Data Collection and Measure

Analysis Plan

Statistical analysis was conducted using Excel. An independent t-test was used to test significant differences between the means of pre-intervention and post-intervention data. Run charts constructed for patient falls to provide a visual depiction of this data over time with the intervention period. This analysis helps determine whether integrating team-based and virtual nursing reduces inpatient falls and improves expected and observed length of stays.

Result

Inpatient Fall

Health outcomes were measured using inpatient fall rates pre-and post-intervention. A run chart was conducted to analyze and determine whether patient fall rates changed during pre-and post-intervention. The run chart analysis indicated that the incidence of falls did not change during pre- and post-interventions. The analysis indicated that there is no difference in patient fall rate. In pre-intervention: In October, there were one assisted and two unassisted falls. In November, there was no fall; in December, there was one assisted fall. During post-intervention, the fall number also remained stable. In January, there was one unassisted fall; in February, there was one assisted and two unassisted falls; and in March, there was one unassisted fall. Please review the table below for further details.

Months	Assisted Falls	Unassisted Falls	Total Falls
Oct-23	1	2	3
Nov-23	0	0	0
Dec-23	1	0	1
Jan-24	0	1	1
Feb-24	1	2	3
24-Mar	0	1	1

Figure 2: Table for Fall Data for Pre- and Post-interventions

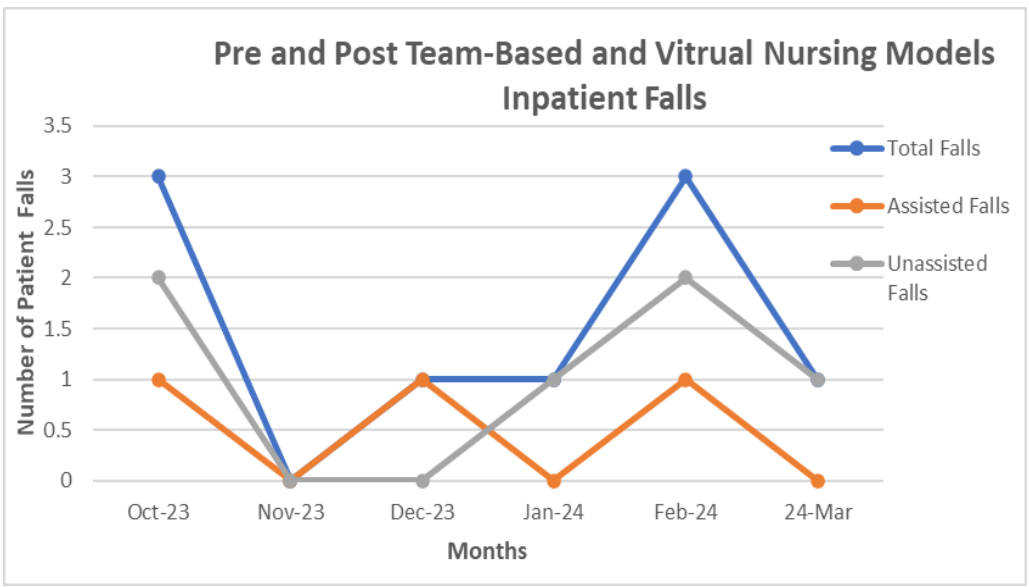


Figure 3: Run Chart for Inpatient Fall

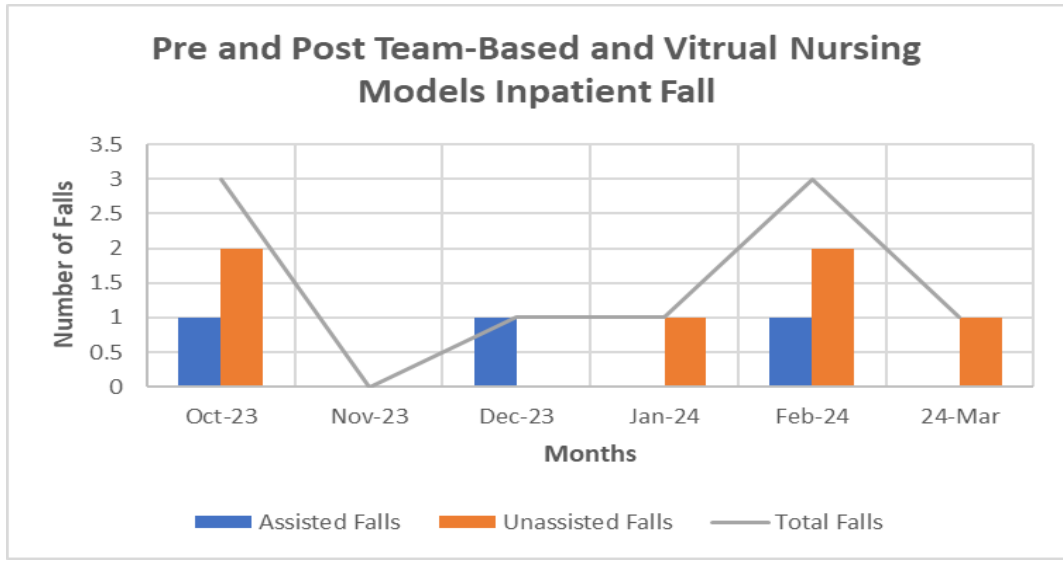


Figure 4: Bar Graph for Inpatient Falls Before and After Intervention

The interpretation of the above bar graphs indicated that the number of inpatient falls during pre-intervention and post-intervention did not show significant differences. However, the number of patients who fell in January was three, while the number of patients who fell in March

was one. That indicated that the integration of this care model has a positive outcome in ensuring patient safety since the number of falls did not increase during the implementation of this change.

Hospital Length of Stay

Expected Length of Stay

The stewardship was analyzed by using the expected and observed length of stay data. Independent t-test statistical analysis was conducted to determine whether there was a statistically significant difference in observed and expected length of stay when using existing nursing models and co-caring models. The analysis of the expected length of stay indicated that the mean for the pre-intervention was 5.72 and for the post-post-intervention mean was 5.27 and $P(T \leq t)$ two tail = 0.48. The result showed that there was no significant difference in the expected length of stay in pre- and post-intervention since $P(T \leq t)$ or p-value was 0.48.

T Test: Two-Sample Assuming Unequal Variances		
	Pre-Intervention	Post-Intervention
	5.72345679	5.266850829
Mean	5.52129334	5.219395162
Variance	0.137202433	0.027897506
Observations	2	2
Hypothesized Mean Difference	0	
df	1	
t Stat	1.050756375	
P(T<=t) one-tail	0.242123413	
t Critical one-tail	6.313751515	
P(T<=t) two-tail	0.484246827	
t Critical two-tail	12.70620474	

Figure 5: Pre- and Post-Intervention Data Analysis for Expected Length of Stay

Observed Length of Stay

The analysis of the observed length of stay indicated that the mean of pre-intervention was 6.26, the mean of post-intervention was 7.98, and $P(T \leq t)$ two-tail was 0.09. The null hypothesis was not rejected since the $P(T \leq t)$ two tail was 0.09. That indicated there was no significant difference in the utilization of existing nursing models and team-based and virtual nursing models in improving the observed length of stay.

T Test: Two-Sample Assuming Unequal Variances		
	Pre- Intervention	Post Intervention
	6.26	7.98
Mean	7.598263033	6.17086097
Variance	0.052478846	0.028543694
Observations	2	2
Hypothesized Mean Difference	0	
df	1	
t Stat	7.091831212	
P(T<=t) one-tail	0.044590041	
t Critical one-tail	6.313751515	
P(T<=t) two-tail	0.089180082	
t Critical two-tail	12.70620474	

Figure 6: Pre- and Post-Intervention Data Analysis Observed Length of Stay

Discussion

This quality improvement project was to identify and assess the effectiveness of team-based care delivery with the addition of virtual nursing in promoting quadruple aims. Quadruple aims for healthcare organizations include enhancing the patient's experience, improving the population's health, reducing costs, and improving the work life of healthcare providers (Arnetz et al., 2022). Some of the quadruple aims addressed in the project are to improve health

outcomes and stewardship by analyzing inpatient falls and expected and observed length of stay data. The Press Ganey platform allowed access to aggregated and de-identified pre- and post-intervention data. This data collection method is proven reliable since the organization utilizes survey and quadruple scorecard data collection and tracking systems.

Analysis of pre-intervention and post-intervention inpatient fall data, as well as expected and observed length of stay data, was conducted using Excel statistical analysis. The analysis indicated that the integration of team nursing and the virtual nursing model did not show a significant improvement in patient fall rates, but the fall rate remained stable and did not increase during intervention periods. These results support findings in the literature, which state that the utilization of technology helps to improve patient safety and organizational performance (Beckett et al., 2021; Russell, 2023; Schuelke et al., 2019). The use of virtual nursing enables continuous and real-time monitoring of patients (Russell, 2023; Schuelke et al., 2019). The bi-directional technology can promote the collaboration of nurses while proactively alerting nurses to potential fall risks, which allows the nurses to remind and orient patients about fall risks and take immediate intervention (Beckett et al., 2021; Trepanier et al., 2023).

The stewardship was analyzed by using the expected length of stay and observed length of stay. Independent T-test analysis indicated that there is no statistically significant difference in observed and expected length of stay between using existing nursing models and co-caring models. However, the average sum of observed and expected length of stay trended down during the intervention span, which indicated that the use of team-based and virtual nursing has positive outcomes in improving organizational performance and resource utilization. This finding is supported by literature, which states that the utilization of virtual technologies can improve care

delivery, reduce hospital-acquired complications, and reduce length of stay and healthcare expenditure (Arabi et al., 2021; Arnetz et al., 2022).

This care model is still in place, and the data on quadrable aims is continuing to be tracked via Press Ganey. No modifications were made to the original proposal. However, quality improvement teams and unit leaders collaboratively work to resolve issues when they arise by creating applicable problem-solving strategies after collecting interdisciplinary feedback. The collaboration helped to implement it without major challenges.

Further, longitudinal studies suggested evaluating caregivers' engagement and patient satisfaction in the use of team-based and virtual nursing models since this model is a new care provision system. The detailed study also allows the investigation of challenges of utilizing new technology in communication systems, caregivers' mentoring and education, caregivers' readiness for changes, challenges of shared responsibilities, and healthcare policy-related challenges in the use of virtual technology. The integration of this new and virtual-based nursing care might confuse the patient and their family due to a lack of expertise on how to use and benefit from this model. Enhancement of caregivers' awareness about the roles and responsibilities of virtual and bedside nurses is also essential to meeting patient needs and treatment goals in the utilization of virtual nursing. At this time, the level of caregivers' awareness and acceptance of team-based and virtual nursing is not included in this study.

Limitations of the Project

Some limitations were identified in the process of implementing this quality improvement project. The limitations of this study are time constraints and the implementation of new virtual technology. Time constraints limited the ability to analyze this project over a longer time frame. However, the presence of a planned time frame has advantages and disadvantages.

Some of the advantages are that it promotes time management resource utilization and motivates the team to work collaboratively and effectively since it helps to outline when a specific task needs to be done and by whom. However, this time constricts the limited ability to evaluate patient satisfaction rate and caregivers' engagement after the use of this team-based and virtual nursing model. Conducting further studies is recommended to analyze patient and caregiver engagement and identify relevant policies and standards of care in using virtual to prevent HIPPA violations.

The utilization of virtual technology in acute care settings is extremely limited. The integration of team-based and virtual nursing models is a new care provision model. The availability of a literature review that directly investigates the benefits and challenges of the utilization of team-based and virtual nursing is limited. However, there are many supportive literature reviews on the benefits of integrating technologies in the care provision process to enhance care outcomes, quality of care, and organizational performance.

Conclusion

The integration of technology improves care outcomes and organizational performance. This quality improvement study shows that there was no significant difference in inpatient falls, observed, and expected length of stay between using the existing nursing model and using the team-based and virtual nursing models. The average sum of observed and expected length of stay trended down, which indicated that the use of team-based and virtual nursing has positive outcomes in improving organizational performance and resource utilization. This finding is supported by literature, which states that the utilization of virtual technologies can improve care delivery, team collaboration, or engagement and reduce healthcare expenditure. The team-based

and virtual model is a new nursing model; longitudinal studies are highly recommended. Further studies also help to evaluate the positive effects of this model on all quadruple aim goals.

Future Implications

The results of this project contribute foundational data to promote the use of virtual technologies in acute care settings, which helps to promote health outcomes and improve stewardship. This project's findings emphasized that the utilization of current and relevant technology plays a vital role in achieving quadruple aims by enhancing team collaboration and the ability to use evidence-based findings. Utilizing virtual and team nursing might help guide clinical practice and promote the achievement of regional or regulatory benchmarks by improving the ability to integrate evidence findings into clinical practice.

References

- Arabi, Y. M., Alsaawi, A., Al Zahrani, M., Al Khathaami, A. M., AlHazme, R. H., Al Mutrafy, A., Al Qarni, A., Al Shouabi, A., Al Qasim, E., Abdukahil, S. A., Al-Rabeah, F. K., Al Ghamdi, H., Al Ghamdi, E., Alansari, M., Abuelgasim, K. A., Alatassi, A., Alchin, J., Al-Dorzi, H. M., Ghamdi, A. A., Al-Hameed, F., ... SCREEN Trial Group (2021). Electronic early notification of sepsis in hospitalized ward patients: A study protocol for a stepped-wedge cluster randomized controlled trial. *Trials*, 22(1), 695.
<https://doi.org/10.1186/s13063-021-05562-5>
- Arnetz, B. B., Goetz, C. M., Arnetz, J. E., Sudan, S., vanSchagen, J., Piersma, K., & Reyelts, F. (2020). Enhancing healthcare efficiency to achieve the Quadruple Aim: An exploratory study. *BMC Research Notes*, 13(1), 362. <https://doi.org/10.1186/s13104-020-05199-8>
- American Association of Critical Nurses. (2023). Nurse staffing think tank: Priority topics and recommendation.
<https://www.nursingworld.org/~49940b/globalassets/practiceandpolicy/nurse-staffing/nurse-staffing-think-tank-recommendation.pdf>
- Awad, A., Trenfield, S. J., Pollard, T. D., Ong, J. J., Elbadawi, M., McCoubrey, L. E., Goyanes, A., Gaisford, S., & Basit, A. W. (2021). Connected healthcare: Improving patient care using digital health technologies. *Advanced Drug Delivery Reviews*, 178, 113958.
<https://doi.org/10.1016/j.addr.2021.113958>
- Beckett, C. D., Zadvinskis, I. M., Dean, J., Iseler, J., Powell, J. M., & Buck-Maxwell, B. (2021). An integrative review of team nursing and delegation: Implications for nurse staffing during COVID-19. *Worldviews on Evidence-Based Nursing*, 18(4), 251–260.
<https://doi.org/10.1111/wvn.12523>

- Bearnes, R. D., Feenstra, B., Malcolm, J., Nelson, S., Garon-Mailer, A., Forster, A., & Clark, H. (2021). Virtual care and the pursuit of the quadruple aim: A case example. *Healthcare Management Forum*, 34(1), 9–14. <https://doi.org/10.1177/0840470420952468>
- Borycki, E. M., & Kushniruk, A. W. (2023). Health technology, quality and safety in a learning health system. *Healthcare Management Forum*, 36(2), 79–85. <https://doi.org/10.1177/08404704221139383>
- Chen, J., Amaize, A., & Barath, D. (2021). Evaluating telehealth adoption and related barriers among hospitals located in rural and urban areas. *The Journal of Rural Health: Official Journal of the American Rural Health Association and the National Rural Health Care Association*, 37(4), 801–811. <https://doi.org/10.1111/jrh.12534>
- Demaerschalk, B. M., Hollander, J. E., Krupinski, E., Scott, J., Albert, D., Bobokalonova, Z., Bolster, M., Chan, A., Christopherson, L., Coffey, J. D., Edgman-Levitan, S., Goldwater, J., Hayden, E., Peoples, C., Rising, K. L., & Schwamm, L. H. (2022). Quality Frameworks for virtual care: Expert panel recommendations. Mayo Clinic proceedings. *Innovations, Quality & Outcomes*, 7(1), 31–44. <https://doi.org/10.1016/j.mayocpiqo.2022.12.001>
- Ekeleme, N., Yusuf, A., Kastner, M., Waite, K., Montesanti, S., Atherton, H., Salvalaggio, G., Langford, L., Sediqzadah, S., Ziegler, C., Do Amaral, T., Melamed, O. C., Selby, P., Kelly, M., Anderson, E., & O'Neill, B. (2024). Guidelines and recommendations about virtual mental health services from high-income countries: *A Rapid Review*. *BMJ Open*, 14(2), e079244. <https://doi.org/10.1136/bmjopen-2023-079244>
- Garcia, C. L., Abreu, L. C., Ramos, J. L. S., Castro, C. F. D., Smiderle, F. R. N., Santos, J. A. D., & Bezerra, I. M. P. (2019). Influence of burnout on patient safety: Systematic review and

meta-analysis. *Medicina (Kaunas, Lithuania)*, 55(9), 553.

<https://doi.org/10.3390/medicina55090553>

Gaziel-Yablowitz, M., Bates, D. W., & Levine, D. M. (2021). Telehealth in US hospitals: State-level reimbursement policies no longer influence adoption rates. *International Journal of Medical Informatics*, 153, 104540. <https://doi.org/10.1016/j.ijmedinf.2021.104540>

Kern, L. M., Safford, M. M., Slavin, M. J., Makovkina, E., Fudl, A., Carrillo, J. E., & Abramson, E. L. (2019). Patients' and providers' views on causes and consequences of healthcare fragmentation in the ambulatory setting: A qualitative study. *Journal of General Internal Medicine*, 34(6), 899–907. <https://doi.org/10.1007/s11606-019-04859-1>

Kim, E. J., & Seomun, G. (2023). Exploring the knowledge structure of patient safety in nursing using a keyword network analysis. *Computers, Informatics, Nursing: CIN*, 41(2), 67–76. <https://doi.org/10.1097/CIN.0000000000000882>

Lluch, C., Galiana, L., Domenech, P., & Sanso, N. (2022). The impact of the COVID-19 pandemic on burnout, compassion fatigue, and compassion satisfaction in healthcare personnel: A systematic review of the literature published during the first year of the pandemic. *Healthcare (Basel, Switzerland)*, 10(2), 364.

<https://doi.org/10.3390/healthcare10020364>

Malenfant, S., Jaggi, P., Hayden, K. A., & Sinclair, S. (2022). Compassion in healthcare: An updated scoping review of the literature. *BMC Palliative Care*, 21(1), 80.

<https://doi.org/10.1186/s12904-022-00942-3>

Martin, B., Kaminski-Ozturk, N., O'Hara, C., & Smiley, R. (2023). Examining the Impact of the COVID-19 Pandemic on Burnout and Stress Among U.S. Nurses. *Journal of Nursing Regulation*, 14(1), 4–12. [https://doi.org/10.1016/S2155-8256\(23\)00063-7](https://doi.org/10.1016/S2155-8256(23)00063-7)

- Madhusudhan, D. K., Watts, S. A., Lord, D. J., Ding, F., Lawrence, D. C., Sheldon, A., Leonard, J., & Bravata, D. M. (2021). Employer-sponsored health centers provide access to integrated care via a hybrid of virtual and in-person visits. *Telemedicine Reports*, 2(1), 247–257. <https://doi.org/10.1089/tmr.2021.0027>
- Norman, G., Bennett, P., & Vardy, E. R. L. C. (2023). Virtual wards: A rapid evidence synthesis and implications for the care of older people. *Age and Ageing*, 52(1), afac319. <https://doi.org/10.1093/ageing/afac319>
- Okoli, C. T. C., Seng, S., Otachi, J. K., Higgins, J. T., Lawrence, J., Lykins, A., & Bryant, E. (2020). A cross-sectional examination of factors associated with compassion satisfaction and compassion fatigue across healthcare workers in an academic medical center. *International Journal of Mental Health Nursing*, 29(3), 476–487. <https://doi.org/10.1111/inm.12682>
- Park, H. N., Park, D. J., Han, S. Y., Tae, J. Y., Jung, K. H., Bae, E. J., & Yoon, J. Y. (2022). Effect of inpatient experiences on patient satisfaction and the willingness to recommend a hospital: The mediating role of patient satisfaction: A cross-sectional study. *Health Science Reports*, 5(6), e925. <https://doi.org/10.1002/hsr2.925>
- Perez-Garcia, E., Ortega-Galan, A. M., Ibanez-Masero, O., Ramos-Pichardo, J. D., Fernandez-Leyva, A., & Ruiz-Fernandez, M. D. (2021). A qualitative study on the causes and consequences of compassion fatigue from the perspective of nurses. *International Journal of Mental Health Nursing*, 30(2), 469–478. <https://doi.org/10.1111/inm.12807>
- Russell, M. (2023). A hybrid virtual nurse model. *Nursing Management (Springhouse)*, 54 (2), 42-49. doi: 10.1097/01.NUMA.0000918212.05937.de

- Schuelke, S., Aurit, S., Connot, N., & Denney, S. (2019). Virtual nursing: The new reality in quality care. *Nursing Administration Quarterly*, 43(4), 322–328.
<https://doi.org/10.1097/NAQ.0000000000000376>
- Siddiqui, M. F., Iqbal, M. P., & Ghayas, S. (2020). Disease to ease: Paradigm shift in clinical approach. *Medical Teacher*, 42(1), 114–115.
<https://doi.org/10.1080/0142159X.2019.1597259>
- Skolka, M. P., Neth, B. J., Brown, A., Steel, S. J., Hacker, K., Arnold, C., Toledano, M., & Mustafa, R. (2023). Improving neurology inpatient fall rate: Effect of a collaborative interdisciplinary quality improvement initiative. *Mayo Clinic proceedings. Innovations, Quality & Outcomes*, 7(4), 267–275. <https://doi.org/10.1016/j.mayocpiqo.2023.05.004>
- Teles, S., Crudo, V., Sangrar, R., & Langlois, S. (2023). Enabling patients as partners on virtual teams: A scoping review. *Journal of Patient Experience*, 10, 23743735231177205.
<https://doi.org/10.1177/23743735231177205>
- Trepanier, S., Schlegel, S., Salisbury, C., & Moore, A. (2023). Implementing a virtual team model in the acute care setting. *Nursing Administration Quarterly*, 47(3), 249–256.
<https://doi.org/10.1097/NAQ.0000000000000584>
- Will, K. K., Johnson, M. L., & Lamb, G. (2019). Team-based care and patient satisfaction in the hospital setting: A systematic review. *Journal of Patient-Centered Research and Reviews*, 6(2), 158–171. <https://doi.org/10.17294/2330-0698.1695>
- Woltsche, R., Mullan, L., Wynter, K., & Rasmussen, B. (2022). Preventing patient falls overnight using video monitoring: A clinical evaluation. *International Journal of Environmental Research and Public Health*, 19(21), 13735. <https://doi.org/10.3390/ijerph192113735>

Acknowledgments

The author would like to thank Bonnie Bowie, PhD, MBA, RN, FAAN, for her constructive feedback, which played a crucial role in this project proposal and the successful completion of this DNP project. A special thank you to Renee Rassilyer-Bomers, DNP, CMSRN, RN-BC, FAAN, for serving as the DNP Project Reader, offering valuable insights, guidance, and mentoring, and providing the opportunity to complete this project at their organization. Heather Martin EdD, MSN, RN, CNRN, SCRNP, CNE-cl for providing constructive insights, guidance, mentoring and the opportunity to complete this project at their organization.