Walden University
ScholarWorks

Walden Dissertations and Doctoral Studies

Walden Dissertations and Doctoral Studies Collection

2021

Applying a Staff Education Project to Increase Telemedicine Patient Safety

Kristy Michelle Wolff
Walden University

Follow this and additional works at: https://scholarworks.waldenu.edu/dissertations

 Part of the Nursing Commons

This Dissertation is brought to you for free and open access by the Walden Dissertations and Doctoral Studies Collection at ScholarWorks. It has been accepted for inclusion in Walden Dissertations and Doctoral Studies by an authorized administrator of ScholarWorks. For more information, please contact ScholarWorks@waldenu.edu.

Walden University

College of Nursing

This is to certify that the doctoral study by

Kristy Michelle Wolff

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Deborah Lewis, Committee Chairperson, Nursing Faculty
Dr. Marisa Wilson, Committee Member, Nursing Faculty
Dr. Patti Urso, University Reviewer, Nursing Faculty

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

Walden University
2021

Abstract

Applying a Staff Education Project to Increase Telemedicine Patient Safety

by

Kristy Michelle Wolff, FNP

MS, Clemson University, 2007

BS, University of South Carolina -Upstate, 2003

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2021

Abstract

A telemedicine education module (TEM) was designed and developed for this staff education project to improve the knowledge of nurses and providers about best practices in telemedicine and patient safety. A pretest and posttest design was used to evaluate if a gain in knowledge occurred after participants reviewed the TEM, which was designed and developed using Knowles theory of andragogy for adult learning outcomes. Thirty-seven potential participants who currently work as clinicians that provide telemedicine services were provided access to the pretest, TEM, and posttest. Nine participants responded, but only three participants' scores could be used for analysis since there were only 3 subjects to complete the pre and posttest. A Brigham and Women's Hospital's Level Two evaluation was applied to the final values. The sample size was limited, leaving questions that support the need for further studies. In contrast, there is support indicating the perceived gap in telemedicine knowledge has narrowed as a result of the COVID-19 pandemic. In addition, this study has the potential to create positive social change by increasing the accessibility of care to patients and increasing the knowledge of clinicians about the concepts of telemedicine and patient safety by applying a two-step process for patient verification and performing a medication reconciliation process at every patient telemedicine encounter. By providing increased accessibility of care to patients a decrease in cost of care for organizations and patients results which leads to an increase in quality of care when evidenced based practices are applied..

Applying a Staff Education Project to Increase Telemedicine Patient Safety

by

Kristy Michelle Wolff, FNP

MS, Clemson University, 2007

BS, University of South Carolina Upstate, 2003

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

May 2021

Dedication

This page is a dedication to all who have supported me on this journey. My son, Noah, who reminds his mother that life makes anything possible. To my chair and committee for believing in me. To Walden University for a lifetime of learning I will never regret, supported by world-class faculty and staff. Finally, I dedicate this paper as the culminative result of each nursing professor or nurse or doctor who has mentored me along the way. I can never thank you enough, and your time and support will never be forgotten or taken for granted. To God, for giving me the gift of life and the ability to work in a profession I will always love: nursing. Finally, to my mom and dad for always believing in me.

Acknowledgments

I would like to acknowledge the Walden University School of Nursing and Walden University for their support and guidance in the process of completing this DNP project. I would also like to acknowledge my DNP Project Committee, and my committee chair. I am forever grateful for your time and support during this phase of my professional development and education.

Table of Contents

List of Figures

Section 1: Nature of the Project

Introduction

The global healthcare workforce has been challenged more than ever recently due to the COVID-19 pandemic. These challenges have called for a quick response from clinicians to find evidence-based quality ways of caring for patients in nontraditional settings. These nontraditional settings have led to a need for interventions aimed at increasing the knowledge alternative of nurse practitioners, advanced practice registered nurses (APRNs), who care for patients using telemedicine. *Telemedicine* is the use of delivery methods such as smartphones, computers, and telephones through applications like Zoom, Skype, and other virtual platforms utilizing software that support this e process. The software supports the process of assessing and treating patients who access healthcare services using alternative delivery methods. This increase in demand for telemedicine services has catalyzed a need for an increase in educational interventions aimed at increasing the knowledge of APRNs and nurses who serve patients in a telemedicine environment.

APRNs are in high demand to provide telemedicine services to patients now more than ever before due to the pandemic. As a result of these demands, I conducted a literature review and identified a gap in knowledge among APRNs about best practices to improve the safety of patients and the quality of care during telemedicine encounters (Rutledge et al., 2017). The Federation of Medical Boards (FSMB) has completed a guide for best practice for doctors during telemedicine encounters, but no such resource has been designed using an applied EBP method to guide APRNs in telemedicine encounters.

The American Association of Nurse Practitioners (AANP, 2020) published recommendations for APRNs for conducting telemedicine encounters, but these recommendations are not a best practice guide. To support the efforts of advancing professional nursing practice and to align with the DNP Essential One, a telemedicine education module (TEM) was developed aimed at increasing the knowledge of APRNs regarding evidence-based best practices (American Association of Colleges of Nursing, 2006). The TEM was shown to a targeted audience of APRNs after the APRNs completed a pretest to assess their existing knowledge. After the PowerPoint presentation of the TEM, the target audience was given a posttest to assess the knowledge gained from the TEM. The results of the pretest and posttest were compared to assess for changes aimed at supporting a gain in knowledge by APRNs. The goal of this DNP project was to increase the knowledge of APRNs about methods and processes that can improve patient safety and quality of care during telemedicine encounters. A literature review guided the development of the staff education module.. The outcomes and implications for positive social change resulting from this project are increased patient safety outcomes that result from gained knowledge of the APRNs from the TEM, a staff educational in-service, resulting in a decreased cost of care and an improved continuity of care for patients who access telemedicine services (Rutledge et al., 2017).

A TEM was designed to improve the outcomes associated with telemedicine encounters to increase patient safety, increasing the quality of care through increased information regarding two-step verification and medication reconciliation. *Telemedicine* is defined as the use of telecommunication technologies (phones, computers, mobile

monitoring devices) to provide medical care and management of patients in alternative settings (Hong & Ong, 2002). Telemedicine encounters can create challenges for both APRNs and patients, increasing the risk of problematic virtual encounters when evidence-based practices (EBPs) are not applied. To improve the accuracy and verification of patients, a two-step process during every visit should include the verification of two patient identifiers to verify the identification of the patient. Two patient verifiers that should be used with every patient encounter are date of birth and name. The second step of the patient verification process is to conduct a medication reconciliation on all virtual patient encounters to decrease drug interactions between current medications and any new medications that may be prescribed during the visit. This process also decreases polypharmacy or duplicate therapy and adverse events and decreasing medical errors, while allowing APRNs to verify the strength, dosage, and frequency of medications to ensure compliance and adherence by patients (Castellucci, 2019).

The risk of medical errors and patient compromise is increased in both remote and telephone encounters with patients leading to costly outcomes, such as lawsuits, increased patient mortality, and patient injuries and permanent disability, which all lead to a financial burden and hardship for patients, APRNs, and healthcare systems. Liability also exists if patients are not located in the state in which the provider is licensed; identifying the location of the patient during the visit is imperative to ensure that a provider is licensed appropriately to see the patient. When patients travel out of state and not in their home state, they must be seen by a provider in the state they are located

unless the provider is duly licensed in another state or unless there is a pandemic state of emergency as was the case during the COVID-19 pandemic (FSMB 2014).

EBP must be applied to improve the outcomes associated with quality of care and patient safety in the telemedicine environment while applying best practices in nursing through use of frameworks, models, and tools that have been well validated to guide the process (FSMB, 2014). EBP is supported with the use of frameworks, models, and tools that support the patient encounter process in nontraditional settings.

There is limited research and knowledge about the use of standards of practice related to verifying a patient's identity and reconciling current medications used. Part of the reason for the limited guidelines and the current gap in knowledge is due to the low numbers of APRNS who provide telehealth services (Rutledge et al., 2017). In addition, Rutledge et al. (2017) found there is limited literature to support the training process of preparing APRNs for telehealth services and to deliver the most effective educational training to APRNs to support this process. Most articles and literature support the training of other medical professionals and doctors, but little content has focused on the training of APRNs, supporting that a knowledge gap exists in their formal training (Rutledge et al., 2017). Most telemedicine services were not in demand prior to the COVID-19 pandemic, but the recent pandemic has led to an increased need for telemedicine education for APRNs. Having a clinical guide for best practices in telemedicine encounters can increase patient safety and quality of care. Due to the gap in knowledge from the scientific nursing perspective further research and more formal educational training must be implemented in the professional training of APRNs to provide them the

knowledge and skills necessary to provide such in-demand services (Rutledge et. al, 2017). Educational training should be supported with hands on training on the job and exposure to telemedicine during preprofessional and postformal training of nurses and APRNs in an effort to improve these outcomes and address the lack of knowledge about telehealth services as it applies to the profession of nursing. (Rutledge et. al, 2017). The TEM was developed to provide best practice information for the patient encounter and included using a two-step patient verification process and a medication reconciliation process that will increase the safety of patients during virtual encounters.

Evidence suggests that prior to the pandemic many nurses and clinicians had little knowledge about telemedicine services, which affected providers' perceptions about this technology (Ayatollahi et al., 2015). Ayatollahi et al. (2015) conducted a survey of over 532 clinicians who worked in two hospitals and three clinics in a northern province of Iran, finding that over 96.1% of clinicians had little knowledge about telemedicine. This finding supports this gap in knowledge as a global issue that affects professional nursing practice at all levels. In addition, Ayatollahi et al. (2015) suggested that providing clinicians with more evidence and knowledge about telemedicine could help determine the perceptions of clinicians. This is an important aspect of data analysis and synthesis; not only is this a social change issue, but the evidence also supports this is a global issue. A gap in knowledge exists in the United States and globally, both currently and prior to the recent pandemic, and this DNP project is important for advancing professional nursing practice and can add knowledge and insight for nurse educators and nurse

professionals about how to increase the knowledge, skills, and perceptions of nurses about telemedicine services.

Problem Statement

Telemedicine continues to be used both locally and nationally, creating a need for increased education on patient processes to increase patient safety and quality of care. The COVID-19 pandemic resulted in various stay-at-home orders and social distancing measures that mandated use of telehealth services for patient encounters; most healthcare providers, including APRNs, were not prepared for this shift to telemedicine. This lack of preparation led to an increased need for staff educational in-services to increase knowledge and awareness among APRNs about methods and processes that increase patient safety and quality of care. The current evidence and literature support that a need exists to increase staff education among clinicians. The increased need for staff education is the result of an increased need for patient safety as a documented gap in knowledge exists regarding processes and methods used during telemedicine encounters. An increase in the need for staff education is needed as well to increase accessibility of care for patients during telehealth encounters.

From the literature, evidence suggests that the profession of medicine has identified a need for increased education to increase patient safety during telehealth patient encounters; the American Federation of Medicine supports the processes used by medical doctors when establishing and providing care for patients virtually. However, there has not been an established process guide or staff educational program designed to meet this need for other healthcare providers, thus leading to a gap in knowledge

supported by the literature. The development of a staff education in-service and process guide would hold a significant value in nursing during the pandemic with supportive evidence from the literature.

APRNs Purpose Statement

The purpose of this study was to increase the knowledge of APRNs about the importance of performing the patient verification process in combination with the medication reconciliation process when conducting telemedicine patient encounters. The purpose of the patient verification process and the medication reconciliation process is to increase patient safety and quality of care while simultaneously decreasing the costs of care. By providing a TEM with a pretest and posttest analysis to measure the knowledge gained by APRNs from attending and participating in the TEM, I assessed the increased knowledge as a result of the TEM.

There is limited research and knowledge about best practices related to verifying a patient's identity and reconciling current medications using telemedicine services in nursing. Part of the reason for the limited research and the current gap in knowledge is due to the low numbers of APRNS who provide telehealth services. Most telemedicine services had not been in demand prior to the COVID-19 pandemic; the pandemic and the shift in healthcare provision led to an increased need for evidence-based information and education for APRNs on telemedicine best practices. Having an evidence-based clinical education resource for best practices in telemedicine encounters can increase patient safety and quality of care. To help address the gap in knowledge from the scientific nursing perspective, a TEM was developed to provide EBP knowledge to support the

two-step process for patient verification and a process for medication reconciliation to increase the safety of patients during virtual encounters. While the Federation of Medical Boards has already completed a guide for best practices for doctors during telemedicine encounters, no resource has been designed using applied EBPs to guide APRNs in telemedicine encounters. Professional organizations, like AANP (American Academy of Nurse Practitioners), have some recommendations for best practices for APRNs who are conducting telemedicine encounters, but such recommendations are limited and do not constitute an official resource and guide.

The research question for this DNP Project is: Will a TEM improve the knowledge of APRNs about patient verification processes and the medication reconciliation process aimed at increasing patient safety during telemedicine encounters? This question was the driving force of this DNP Project.

Telemedicine is viewed as a sociocultural innovation that can make positive social changes for society and healthcare (Hong & Ong, 2002). Positive social change is the advancement of social acceptance and social wellness within a community. A social change can also be applied to a virtual environment and can still support the mission of Walden University seeking to improve the social perspectives of communities. The mission of social change also seeks the use of avenues and methods that consider the virtual environment and how social change can be applied in a virtual community. The use of telemedicine services improves the accessibility of care to patients within a community, which creates improvement or social change from a virtual perspective, removing barriers for patients who face issues with accessibility. Social change would

improve in a community where the overall health and well-being of the community is improved. A TEM for APRNs can increase patient safety in a virtual environment and create social change by improving the health outcomes of patients who receive services virtually.

Nature of the Doctoral Project

Telemedicine services are patient encounters that meet the criteria by the Centers for Medicare and Medicaid Services (CMS) to be reimbursed for provider encounters when there have been two patient verifications applied during the process—date of birth and name—to increase patient safety. In addition, medication reconciliation should be performed to ensure patient safety and increase the rate of reimbursement by third-party payers.

The desired outcomes of implementing this EBP educational intervention is to increase patient safety during telemedicine encounters with strict adherence to a verification process of patient identifiers and performing medication reconciliation during every patient encounter. These outcomes support the use of EBPs that improve patient safety and quality of care, which in turn can lead to financial cost savings and increased revenue. These results also lead to a per capita savings for both APRNs and healthcare systems, which in turn results in new opportunities to increase staffing or improve or upgrade current software and technology, while simultaneously having the ability to accept more clients.

The pretest and posttest method was used to guide the measurement of the findings. The Brigham and Women's Hospital Center for Nursing Excellence (BWCE)

Level 2 assessment of knowledge was applied to learning outcomes pre- and post-knowledge assessment (BWCE, 2020) The data will later be calculated after the study determine if there was a gain in knowledge among nurses. In this project, I sought to improve APRNs' knowledge regarding the application of EBP to the nursing care process, which has proven to increase patient safety and quality of care as well as patient satisfaction among the most recent literature as a whole. These findings support the positive social effects described above which are the result of applying EBP to the process patient care during telemedicine encounters.

The setting for this research was a telemedicine work environment in which patients access telemedicine services daily. I planned to accomplish this project in the identified setting and context using a staff education in-service using a pretest and posttest assessment applying the Level 2 learning guidelines by BWCE. The analyze, design, develop, implement, evaluate (ADDIE) model was used to guide the process of the instructional design of the TEM (White et. al, 2016). The concepts and steps of ADDIE were used to guide the process of developing the TEM (White et. al, 2016). The ADDIE model also supported the process of gaining knowledge about the targeted audience and the style of learning that supports more successful outcomes in adult learners. Malcom Knowles' andragogy theory supported the outcomes and success of developing a TEM aimed at adult learners with the understanding that the four principles of the adult learning theory would be applied (White et. al, 2016).

Significance

There remains a limited body of knowledge about telemedicine encounters that supports the use of the patient verification process and the use of a medication reconciliation process with each telemedicine encounter specifically intended to guide APRNs (Rutledge et. al, 2017). The literature points to a gap in knowledge, likely due to the low number of APRNs who provide telehealth services. The gap in knowledge of the training and skills needed by APRNs to provide telehealth services is also due to lack of exposure and training obtained during their formal APRN education and training (Rutledge et. al, 2017). Due to the COVID-19 pandemic, a need for increased education to guide this process for APRNs became necessary to support the increased demand for telehealth services by APRNs. The development of this DNP project has the potential to change the health outcomes of those seeking telemedicine encounters with APRNs now and in the continuum by increasing the knowledge and skills of the APRNs who use telemedicine to care for patients virtually.

To address the goals and desired outcomes of this DNP Project, the specific practices and processes to achieve the targeted outcomes began with a thorough review of the literature. The concepts and words searched were *nurse practitioner, telemedicine*, and *guidelines and education*. The results of the literature review support the development of the TEM and support the desired learning objectives. A TEM was developed regarding the two-step method involving patient identification and medication reconciliation processes, which will be viewed by APRNs within an organization. A pre- and posttest questionnaire was applied to measure if there was a gain in knowledge; the

Level 2 Knowledge Assessment from BWCE (2020) was used to measure the outcomes or validity of the TEM.

The results will be presented to key stakeholders and key users. After the presentation to key users and stakeholders, the final report was developed from the results and the results will be disseminated. The desired outcome is for the results to reveal higher posttest scores after the TEM than the pretest scores using the BWCE Level 2 Knowledge Assessment Questionnaire. If the pretest scores are lower than the posttest scores after the TEM, there is a clear link between the proper collection and use of the data and evidence that is validated as being capable of increasing the knowledge of APRNs. The following objectives will support the process of learning and desired goals of this DNP Project.

Objectives and Proposed Outcomes

Objective 1: The provider will develop a greater understanding of how to increase patient safety using a two-step method to ensure the accuracy of patient verification process during a telemedicine encounter.

Objective 2: The provider will develop a greater understanding and gain of knowledge about the importance of conducting a medication reconciliation during each telemedicine encounter to increase patient safety.

Objective 3: The provider will have a higher posttest score than pretest score after viewing the TEM.

Objective 4: Share the prepared Staff Educational In-Service project with organizational stakeholders, and how you plan to deliver the Staff Educational In-

Service and how the application of the Brigham Women's Hospital Pre and Post Test Scores assessment to assess level of knowledge at level 2 will be applied to validate a gain in knowledge from the collected data that is statistically analyzed quantitively.

Objective 5: Consider any revisions or suggestions of stakeholders and key leadership prior to disseminating the Staff Educational Inservice.

Objective 6. Gain ethics approval at the site level and through the Walden IRB process.

The objectives guided the design and teaching methods by applying Knowles' theory of andragogy. These objectives were anticipated to be the outcomes necessary to achieve a gain in knowledge by nurses after taking the pre- and posttest and viewing the TEM.

Several objectives have been outlined to guide the process of the design and development of this staff education project or TEM. The first objective is to increase the knowledge of the provider by helping the learner to develop a better understanding of how to increase patient safety using a two-step method to ensure the accuracy of the patient verification process during a tele medicine encounter. A second objective is to support the role of the provider developing a greater understanding and gain in knowledge about the importance of conducting a medication reconciliation during each telemedicine encounter to increase patient safety. The third objective of the provider is that after attending the staff education or TEM that they will have a higher posttest score than pretest score.

After conducting a study scholar practitioners and nurse leaders should also define a plan for dissemination and this should be included in the list of objectives and proposed outcomes. The fourth objective aligns with the goal of disseminating knowledge among other professionals, organizations, and stakeholders by sharing the TEM and how you plan to deliver the staff education project, and how the application of the BWH Pre and Post Test Scores assessment to assess level of knowledge at level 2 will be applied to validate a gain in knowledge from the collected data that is statistically analyzed and quantitively. The fifth objective will be to consider revisions or suggestion of stakeholders and key leadership prior to disseminating the Staff Educational Inservice. Lastly, the final objective number six will be to gain ethics approval at the site level and through the Walden IRB process.

This process was aimed at creating social change and advancement for the profession of nursing while improving the knowledge gap among nurses regarding telemedicine. Stakeholders and key users, and patients will potentially be impacted by this project addressing the need for process methods that increase patient safety and quality of care when APRN's conduct patient encounters using telemedicine. The results were presented to key stakeholders and key users. After the presentation to key users and stakeholders, a final report was developed from the results and the results will then be disseminated. The Staff Education Manual from Walden University will be used applying the ADDIE model (White et. al, 2016).). The desired outcome is for the results to reveal higher posttest scores after the staff education in-service than the pretest scores using the BWCE Level 2 Knowledge Assessment (BWCE, 2013). If the pretest scores are lower

than the posttest scores after the TEM, a clear link exists between the proper collection and use of the data and evidence validated as being capable of increasing the knowledge of the provider after attending (BWCE, 2013).

The potential contributions of this doctoral project will increase the presence of the nursing profession in the delivery of staff educational literature that improve the process methods used by APRNs to increase patient safety during telehealth encounters. This TEM will add a presence for the nursing profession while creating a new area of research that should result in more studies and staff educational projects focused on increasing patient safety during telemedicine encounters with APRNs. This TEM also has the potential to create social change within the profession of nursing as well.

The potential for the transferability of this doctoral project does exist and could add both a supportive perspective as well as expanded perspective to similar practice area with the content and design of the study. The TEM could be expanded or modified and used in similar professions to increase the safety of telemedicine encounters virtually. The literature indicates that other professions are now also using telemedicine to provide healthcare virtually due to the social distancing requirements of the COVID-19 pandemic. Some of these professions include social workers, counselors, dieticians, speech therapists, occupational therapy, and pharmacists. There are many professions who are not using telemedicine for follow-up visits. This DNP project would likely result in high transferability to many professions as outlined above.

With any project or study comes a desire that the findings and results will create the potential for implications that create positive social change or that the effects will

increase the awareness of a need for further development to create social change on a larger scale. Nonetheless, the findings of a study have limitations in the results. There is limited research and knowledge about the use of standards of practice related to verifying a patient's identity and reconciling current medications. Part of the reason for the limited guidelines and the current gap in knowledge is due to the low numbers of APRNS who provide telehealth services. Most telemedicine services were not in demand prior to the COVID-19 pandemic; this pandemic has led to an increased need for more detailed clinical information for APRNs regarding telemedicine best practices.

Having a clinical guide for best practices in telemedicine encounters can increase both patient safety and quality of care. Due to the gap in knowledge from the scientific nursing perspective the TEM was developed to provide a standard for patient telemedicine encounters that includes using a two-step process for patient verification and a process for medication reconciliation to increase the safety of patients during virtual encounters. A post-certification program has been suggested to support APRNs in gaining the skills and knowledge necessary to perform and provide telehealth services (Rutledge et al., 2017). The lack of exposure and training for APRNs has resulted in this population of providers being unprepared for this role (Rutledge et. al, 2017).

While the Federation of State Medical Boards (FSMB) has already completed a guide for best practice for doctors during telemedicine encounters, no resource has been specifically designed using an applied EBP method to guide the APRNs role in telemedicine encounters. Professional organizations, like AANP, have some recommendations for best practices for APRNs conducting telemedicine encounters.

Sources of Evidence

Telemedicine services are patient encounters that meet the criteria by CMS to be reimbursed for provider encounters when there have been two patient verifications applied during the process to increase patient safety. In addition, medication reconciliation should be performed to ensure patient safety and increase the rate of reimbursement by third-party payers. The desired outcomes of implementing this EBP intervention was to increase patient safety during telemedicine encounters with strict adherence to a verification process of patient identifiers—name and data of birth—while performing medication reconciliation during every patient encounter. These outcomes support the use of EBP that improve patient safety and quality of care, which in turn leads to a financial cost savings and increased revenue (CMS, 2020). Improving the application of EBP to the nursing care process has been proven in both increased patient safety and quality of care as well as increased patient satisfaction. These outcomes improve the overall health and well-being of patients at the population health level which also creates a social change within a community. These results also lead to a per capita savings for both APRNs and healthcare systems (CMS, 2020). The per capita savings in turn can lead to new opportunities to increase staffing or improve or upgrade current software and technology, while simultaneously having the ability to accept more clients. According to CMS (2020) using telemedicine services can and does have the potential to improve outcomes at the population level when EBP are applied leading to an overall cost savings for all parties involved from the provider to the patient, as well as the healthcare organization or system. The pre- and posttest method was utilized to guide the

measurement of the findings. The BWCE Level 2 assessment of knowledge was applied to learning outcomes pre- and post knowledge assessment (BWCE, 2013). In addition, Knowles theory of andragogy was applied to the learning objectives and outcomes to guide the process of measuring a gain in knowledge among clinicians.

Summary

Telemedicine is being used now more than ever due to COVID-19, thus increasing the need for provider and clinical education to improve outcomes with the development of evidence-based education to improve patient safety and quality of care by increasing the knowledge of APRNs who provide telemedicine services. In this staff education project, I aimed at improving the quality of care and safety of patients in telemedicine encounters using a staff educational in-service. The expected outcomes were that knowledge from the TEM would lead to increased patient safety and quality of care, thus leading to a decrease in cost of care. I used the pretest and posttest assessments before and after the TEM to measure a gain in knowledge among APRNs who participated in the staff education in-service. The outcomes are reflected in the pre- and posttest scores. A numerical increase in the posttest scores compared with the pretest scores will indicate support for a gain in knowledge from the TEM.

In this staff education project, I used a PowerPoint presentation to deliver the TEM; a pretest and posttest measurement which was used to support the results. The use of telemedicine services for patients to access healthcare is on the rise due to the COVID-19 pandemic as is the need for APRNs prepared for these telemedicine encounters. A staff education DNP project was designed and delivered to increase the knowledge of

APRNs on how to increase patient safety using a two-step process for patient verification and medication reconciliation. The results of this process will also increase the quality of care, which then results in a decreased cost of care when the potential for medical errors is decreased or mitigated through application of EBPs. The use of a staff education in-service was projected to increase the knowledge of APRNs about these methods and processes, leading to overall positive social change which aligns with the goals of the DNP project as outlined.

Telemedicine encounters increase the risk of liability and result in a higher risk of medical error when processes and methods are not used to increase patient safety. Checklists, process methods, and EBPs can be used to improve the quality of care and these outcomes. The goal of the DNP project and staff educational in-service was to add another perspective to guide and support this process due to the sudden demand for a greater number of APRNs to provide telemedicine services for patients and for the future development and advancement of the profession of nursing. Finally, the further development and description of data collection methods will need to be explored. In addition, the methods and use of frameworks and models used to guide this DNP project and staff education in-service are further outlined and explained in Section 2.

Section 2: Background and Context

Telehealth patient encounters are on the rise due to the COVID-19 pandemic, and the demand for telemedicine services has placed APRNs in high demand. Telehealth services are a new concept for most APRNs, and the literature indicates a gap in knowledge exists regarding this population, supporting the need for a staff education project to increase the knowledge of APRNs who provide telemedicine encounters. In this study, the end results of a pretest and posttest were statistically analyzed to determine support for the projected outcomes and objectives of the staff education project.

Healthcare has been challenged in meeting the needs and demands of patients who access healthcare services using telehealth or telemedicine. This increase in demand and need for telemedicine services has led to a need for further educational interventions aimed at increasing the knowledge of APRNs and nurses who provide services to patients via telemedicine. A staff educational in-service project was designed and delivered to increase the knowledge of APRNs who deliver care via telemedicine encounters. The use of a literature review combined with a statistical data evaluation method provide support for the findings of the intervention, which was measured with a pre- and posttest to evaluate a gain in knowledge. The results of the APRNs' pre- and posttest after viewing the TEM should support a gain knowledge of APRNs about methods and processes that can improve patient safety during telemedicine encounters. The outcomes and implications for positive social change are the increased patient safety outcomes that result from the gained knowledge of the APRNs from the TEM, thus potentially resulting in decreased cost of care and improved continuity of care for patients who access

telehealth services. The use of telemedicine services has led to a decrease in the cost of care while increasing accessibility of care for many patients who have challenges with transportation and mobility, according to Rutledge et al. (2017).

For this project, I designed a TEM to improve outcomes associated with telemedicine and telehealth encounters to increase patient safety and quality of care. *Telemedicine* is defined as the use of telecommunication technologies (phones, computers, mobile monitoring devices) to provide medical care and management of patients in alternative settings (Hong & Ong, 2002).Telemedicine encounters create challenges for both APRNs and patients, increasing the risk of virtual encounters when EBPs are not applied. To improve the accuracy and verification of patients, a two-step verification process should occur during every visit and should include the verification of two patient identifiers. Two patient verifiers that should be used with every patient encounter are date of birth and name. The second step of the patient verification process is to conduct a medication reconciliation on all virtual patient encounters to decrease drug interactions between current medications and any new medications that may be prescribed during the visit. This process also decreases polypharmacy or duplicate therapy while allowing APRNs to verify the strength, dosage, and frequency of medications to ensure compliance and adherence by patients. Telemedicine has placed APRNs in high demand, thus creating a distinct need for further education and training to increase the skills and knowledge of APRNs who are currently working in telemedicine.

Concepts, Models, and Theories

The concepts of telemedicine and nursing knowledge were the focus of the TEM with a direct emphasis on how the two-step method of patient verification coupled with the process of medication reconciliation. The TEM will increase the knowledge of APRNs who participate, increasing nursing knowledge about procedures and processes that increase the accuracy of patient verification while decreasing the risk of medication errors by reconciling medications during telemedicine encounters. To develop a staff education project for APRNs, who are all adult learners, an understanding of adult learning and best practices in adult learning, was necessary. The development of a staff education project for APRNs who have an understanding of the process of adult learning, and who are all adult learners was required to meet the goals and objectives of this TEM.

Knowles' theory of andragogy was used to support the development of the TEM. Knowles' theory applies the concept of education and the adult learner (Pappas, 2013). Knowles is best known as a U.S. educator who coined the term *andragogy* as the interchangeable concept of adult learning (Pappas, 2013). According to Knowles, any form of adult learning is considered andragogy (Kearsley, 2010). Andragogy is the culmination of the art and science of learning as viewed and demonstrated by adult learner (Pappas, 2013). Knowles uses the key concepts of five assumptions and four principles about adult learners and how they are driven to gain knowledge when all concepts involved in the adult learning process are consistent and assumed as they align with the learning process of the adult learner (Pappas, 2013). The five assumptions of Knowles are self-concept, adult learner experience, readiness to learn, orientation to

learning, and motivation to learn that guided the development of the staff education project or TEM (Pappas, 2013).

Knowles theory also guides the learning process in adults by applying four principles from the theory of andragogy that defines the way most adults learn. The four principles by Knowles also provides insight into how adult learners are motivated to learn new concepts or ideas. The first principle of the theory of andragogy by Knowles is that adults need to be involved in process of learning which includes the planning and evaluation of their instruction (Pappas, 2013). The second principle of Knowles is that adult learners must experience learning and be allowed to make mistakes for the learning process to occur (Pappas, 2013). The third principle by Knowles is that adults are more interested and motivated by learning that has instant benefits or relevance to their current role or job (Pappas, 2013). The fourth principal by Knowles is that adult learning is more about focusing on solving problems, and not just learning content (Pappas, 2013).

Knowles assumed that for an adult to learn something four principles of learning should be applied when creating learning outcomes and objectives. For instance, the first assumption is that adults are active learners, and there is a need for the adult learner to be involved in both the planning and instruction process of learning (Pappas, 2013). The second assumption is that adults learn from experiences, and mistakes must be made to learn as an adult; this process sustains learning according to Knowles (Pappas, 2013). The third principle of andragogy is that adults are more engaged with relevant topics of learning that relate to their job or current life situations (Pappas, 2013). Finally, the fourth learning principal according to Knowles is that adult learning is problem centered and not

content centered (Pappas, 2013). These principles and concepts of the adult learner by Knowles will be applied to the design and implementation of the TEM.

Additionally, Knowles emphasized that learning should be task oriented and focused on problem solving within the contextual environment. Andragogy should be focused on the relevancy of the information to the learner and must be individually specific and timely to their present situation. In other words, the TEM should focus on the adult learner's present situation and experiences to meet the goals and objectives of the TEM. Knowles' theories provide support in the application of adult learning theory and andragogy to the learning outcomes and objectives of this TEM. In developing the TEM, I used the four principles of adult learning and five assumptions of adult learning outcomes to the design the project, while aligning the goals and objectives of this TEM in the process.

Relevance to Nursing Practice

Telemedicine has been underused in the past and was not as necessary in healthcare or used by the nursing profession until the COVID-19 pandemic (Centers for Disease Control and Prevention, 2020). I searched the concepts of telehealth, telemedicine, APRNs, and clinical education and nursing knowledge and found that a gap in knowledge exists. To support the efforts of increasing knowledge in this area, more studies and efforts should be focused on implementing and designing staff education projects to increase the knowledge of APRNs who provide telehealth services. The benefits of studying the statistical results of a staff education in-service are relevant to the current trends and state of professional nursing practice because of the COVID-19

pandemic. This project is relevant to current nursing practice because a gap in knowledge has been revealed. The results of this DNP project could lead to an increase in patient safety and an increase in the quality of care, both of which can be linked to a decrease in the cost of care. This staff education DNP Project is relevant to nursing practice and supports the advancement of EBPs and can influence, shape, and impact the future professional nursing practice. This study also can impact other studies seeking to replicate this DNP project on a larger scale to lessen the gap in knowledge with supportive evidence and statistical data.

To decrease a gap in practice, more support and education are needed at the student level for both nurses and APRNs using simulation labs and simulation methods that include new health information systems and technology during clinicals and practicums. The concept of telehealth and simulation to enhance the skills and knowledge of nurse and nurse practitioner students has been proven successful in decreasing the gap in practice and the gap in knowledge. Several universities and professional nursing organizations, such as the AANP and the American Nurses Credentialing Center, have already designed and implemented several training courses aimed at decreasing this gap in practice as well.

This TEM advances nursing practice and fills both a gap in practice and knowledge that exists among professional nursing practice at all levels. The telemedicine education module will advance current nursing practice by filling a gap in nursing practice and knowledge by increasing the skills and knowledge of nurses who care for patients using telemedicine. While this project is not entirely inclusive, it does add

another aspect to clinical processes and clinical education of adult learners and narrows the gap that exists in post professional training within the nursing profession. This DNP project will narrow the practice gap while advancing nursing knowledge through the application of Knowles theory of Andragogy in the context of the adult learner.

Local Background and Context

APRNs' both locally and nationally are being called upon during the pandemic to have both the knowledge and skills to provide telemedicine services within every community. The evidence supports that the practice focus question is justified and that many APRNs are lacking in the skills and knowledge necessary to provide telehealth services and most require some form of training. Since most APRN programs do not provide clinical experiences or skills simulation training to support the role of the APRN it has now become both a priority and focus for all current APRN programs to provide some form of training in a skill simulation lab or during clinical experiences to prepare APRN students for these types of patient encounters upon graduating. Lack of knowledge and exposure to telemedicine in both professional work settings and formal educational training programs for APRNs have been stated by most APRNs as the main reason for not using telemedicine services prior to the pandemic. This concept of lack of knowledge and need for training in the APRN educational programs has gained momentum and more programs at the university level are implementing simulation lab training for both undergraduate nursing programs, and master's level nursing programs for both nurse practitioners and other nursing professionals to mitigate these gaps in knowledge and practice.

The institutional context is appropriate for both the local community setting and the current national pandemic that also faces the challenges of the effects of lack of knowledge and professional training for nurses and nurse practitioners in relation to telemedicine services in both pre-education and post education training settings. Therefore, the justification for further research and educational training is warranted at the state and federal level and should be well supported among state and federal organizations and entities. The support for the pandemic has given rise to the allocation of funding for many state agencies to provide educational programs to address these issues surrounding lack of knowledge and training among all healthcare professionals to increase the number of professionals who are prepared to serve patients during the pandemic.

The mission and vision of the TEM aligns with the current vision and mission of both federal and state initiatives aimed at combatting the challenges of the pandemic as it applies to patients accessing healthcare services during the pandemic. Most telemedicine services and practices within a state are regulated by the board of nursing and the board of medicine in each state. To the extent of these state and federal regulations are the only governance and regulation issues

Role of the DNP Student

There are no potential biases of conflicts that have been identified in the planning process of this proposal. Therefore, no specific steps are needed to mitigate specific biases. In contrast, during the planning phase of this proposal potential biases are evaluated, and proper planning and steps have been formulated during this process to

plan for any potential biases that may arise. At this time there are not identified potential biases.

The role of the DNP student in this TEM was to develop, implement and evaluate an educational intervention aimed at increasing the knowledge and skills of APRNs who use or will use telemedicine services to during patient encounters. The TEM did reflect the goals and objectives outlined in this proposal and was aimed at creating data that supports the objectives and goals of the TEM.

The role of the DNP student was to answer the stated problem or question with findings from the study that are supported by the statistical calculation of the data that is obtained from the pre- and post-test scores of the participants (nurses and APRNs from the study) to demonstrate that a gain in knowledge occurred after the clinical in service. The DNP student also had the role of designing, developing, and delivering the staff educational in service and then plans to disseminate the findings at both the organizational and professional practice level among both state and federal entities. Professional nursing organizations plan to also be targeted by the DNP student to disseminate knowledge and findings as well to engage stakeholders and to advance professional nursing practice.

Role of the Project Team

During the development and design of the staff educational in service a project team was formed and consulted about the design, development, and delivery of the TEM at each step and level of the process. The DNP student worked with the organizations and the Walden Committee and the DNP project chair to develop and finalize all aspects

project as it coincides with the DNP checklist and this proposal. The project team can also be compared to a task force that supports the process of the design, development, and delivery of the staff education project. The Project Team guided the finalizations of the staff educational project prior to delivery and the DNP student gathered and analyzed all consultative feedback from the project team and the Walden Committee and the Project Chair. All revisions were made according to the feedback of the team. The Project Team also guided the continuous role of evaluating the staff education project with continuous feedback.

Summary

APRNs' need knowledge to support the process of applying evidenced based practices to telehealth encounters. Knowledge is gained through learning and adult learning can be improved with the application of a framework by Malcom Knowles that supports the process of adult learning, while combining the theories that support nursing science in the application of research seeking to improve patient outcomes while increasing the knowledge and safety of the telemedicine environment. This TEM is proposed to increase the knowledge and skills of advanced practice providers caring for patients in Telemedicine Health Encounters. This DNP Project is aimed at decreasing the lack of knowledge that exists among nurses regarding telemedicine. In addition, the gap in knowledge will be narrowed that exists as it is now in its current state by adding an additional resource to support the use of telemedicine services during the pandemic.

Section 3: Collection and Analysis of Evidence

Introduction

An increase in telemedicine and telehealth services is affecting the profession of nursing and demanding more skills and knowledge from this population of healthcare providers. This staff education project was designed to support this movement in nursing. For the purposes of completing a DNP project, I used the following research methods to satisfy the criterion required by the DNP Project Checklist.

To support this project, I reviewed evidence using concepts and theories that support the goals and objectives of the telemedicine patient safety project, aimed at increasing provider knowledge and skills regarding the use of patient safety parameters as outlined in the telemedicine patient safety project. The telemedicine patient safety project was the outcome of data analysis of concepts and ideas as they apply to the nursing profession and the use of telemedicine services by nurses. The concepts that were queried were *nursing knowledge, telemedicine, patient safety*, and *patient outcomes*. Additionally, Knowles' theory of andragogy was analyzed and reviewed and applied to the DNP Project.

Practice-Focused Question

The practice-focused question focuses on the current identified gap and trends in the nursing profession. The practice-focused question was focused on nurses and nursing knowledge and skills related to patient safety and telemedicine encounters and services: Will a TEM improve the knowledge of APRNs about patient verification processes and medication reconciliation aimed at increasing patient safety during telemedicine

encounters? This question was the driving force of the DNP Project. The application of methods, theory, and data analysis was used to answer the practice-focused question with a focus on the adult learning theory of Knowles.

Sources of Evidence

Sources of evidence for this project were obtained from databases in the Walden University Library using search engines from Medscape, Medline, EBSCOHost, and CINAHL. In addition, EScholar was used to narrow the evidence and data as they currently exist to answer the DNP practice-focused question. The sources of evidence will guide the supportive evidence to prove that gap in knowledge exists in the current state of nursing practice as it applies to nursing knowledge and skills.

The design of the educational materials was in the form of a PowerPoint presentation or TEM that was viewed by subjects after they completed the pretest. The design of the TEM was centrally focused on nurses and advanced practice providers and physicians. The TEM was designed from evidence-based findings presented in the literature review obtained from the resources. The aim of the TEM was to increase the knowledge of the participants about telemedicine patient safety practices to increase the quality and safety of care when patient encounters occur virtually. The TEM was followed by a posttest that was given to participants to assess their knowledge after the education program. The results of the pre- and posttest were used to measure the proposed gain in knowledge by nurses and clinicians, and the results were statistically analyzed for evidence supporting a gain in knowledge from the participants who viewed

the TEM. The development and design of the TEM was completed by the student and then sent to the committee chair for review and approval.

Protections

Ethical considerations and protections of all participants are necessary to ensure institutional review board (IRB) approval and to support the validity of the test results. Ethical considerations should be focused on protecting the identity of the subjects and any entities or organizations that are part of the study. To ensure the identity of the subjects was protected, I ensured that no subject could be identified during the pre- and posttest by assigning a number to each document at random to ensure there was no identifiable information. I also changed the name of any identifiable organization, subject, or faculty member when necessary to ensure no identifiable information linked the identity of the subject or organization or faculty members. I ensured compliance with these requirements as outlined by Walden University and the IRB process. In addition, I sought and received approval from the IRB prior to completing any testing of the subjects.

In addition, other ethical consideration should focus on the informed consent process of the subjects. After IRB approval, I obtained informed consent from all study participants. The informed consent process outlined all risks associated with participating in the study. The informed consent process was considered complete when the participants signed a document agreeing to participating in the study; a signature indicated that the subject understood all risks associated with the study and released any liability. This process ensured that all ethical considerations of this study were

considered, and all subjects are protected. I used these strategies to ensure all ethical obligations and considerations of all subjects were maintained during the process.

Strategies for Success of the Telemedicine Education Module

Working relationships are essential to any study seeking to improve knowledge and EBPs. The aim of this TEM project was to improve the knowledge of nurses and other clinicians about the steps to increase patient safety during telemedicine encounters. To successfully complete the TEM project, I implemented some strategies to improve the success of developing strong working relationships between myself, the DNP committee chair and team, and Walden University as well as the supporting agency that oversaw the TEM administration and process. To ensure a strong working relationship, I practiced effective communication with all team members, ensuring that a continuous evaluation process was implored during all steps of this process to mitigate all potential barriers. Effective communication is not the just process of spoken words, but the meaningful understanding and exchange of the words that have meaning (AONE, 2021). Ongoing evaluation was continuous and is required to sustain any working relationship at all levels.

Other strategies used to develop working relationships with subjects were to develop incentives that give subjects reward for completing the study. One strategy is to seek approval for the subjects to receive CEU or continuing medical education credits for completing of the study. This incentive was likely to provide reward for the time and effort of the subject who offered their professional time to complete the study. Another incentive was encouraging nurses and clinicians that they were participating in having a

hand in nursing research and that they would be supporting the process of advancing professional nursing practice at all levels.

The IRB process was also part of the design and development of the TEM and is necessary to ensure compliance and ethical treatment of subjects. The IRB approval process was completed, and the IRB and the committee chair and the committee oversaw this project . The IRB review process was completed prior to administering the TEM. I completed Form A to begin the IRB and ethics approval process. The role of the IRB is to ensure a study is ethical and compliant and meets the requirements for approval. I communicated with the committee chair and the IRB to gain approval and made any necessary changes during the review process to gain approval. This process is ongoing during and after the approval process and compliance must be ensured and ethical standards must be always applied during the study. The approval by the IRB Board was granted on 03-19-2021 and was given approval number 03-09-21-0991490.

Analysis and Synthesis

It is projected it will be possible to accomplish this project in the identified setting and context using a staff education in-service (TEM) utilizing a pre- and post-knowledge test applying the Level 2 learning guidelines by Brigham and Women's Hospital.

The pre and posttest method will be utilized to guide the measurement of the findings. The Brigham Women's Level 2 assessment of knowledge will be applied to learning outcomes pre- and post-knowledge assessment (Brigham Women's, 2013).

Data will be collected from the pretest and organized according to score and experience. The post test data will be organized according to scores and experience as well. A data management system is proposed to analyze the pre and post test scores.

Data will be managed with no identifiable information that could be linked to the test subject. The pre and post tests will be given online pre and post TEM participant and will be assigned a number that will be the same for the pre and the post test. The recording, tracking, and organizing, and analyzing of the evidence will be organized using Microsoft Excel via spreadsheet. It is proposed that the use of SPSS might be implored to analyze the results if necessary.

The following procedures will be utilized to ensure the integrity of the evidence. The first procedure that will be utilized to ensure the integrity of the evidence is to ensure the anonymity of the subjects who participate in the study by having no identifiable information that can be linked to the subject participant. In addition, the evidence will remain encrypted online and only accessible with a password by the DNP student who designs and develops the TEM and the pre and posttest.

Missing values and outliers must be pretreated or mitigated prior to the finalizations of data results. Missing values and identified outliers that are identified during the data collection process can cause bias or skewed results leading to a compromise in the power of the study (Kwak and Kim, 2017). It should also be notated that the processing and handling of these outliers and missing values can affect the efficiency of data and can affect the use of applying an estimated statistics value to mitigate outliers and missing data (Kwak and Kim, 2017). This effect can lead to the

overestimation or underestimation of data and is of great importance to fix such issues and plan for this process during the pre-planning phase (Kwak and Kim, 2017).

Missing values are the result of information loss, dropout of the subjects, or nonresponses of the subjects (Kwak and Kim, 2017). Missing values create a smaller samples size in turn which can compromise the reliability of the findings. In contrast, outliers are numerical results or values that are not within the estimated or expected range creating an imbalance in the power of the evidence in its current state and are usually a result of subject response errors or data entry errors (Kwak and Kim, 2017).

Summary

The nursing profession has been active and engaged during the process of responding to the pandemic (COVID-19) by utilizing telemedicine and technology systems to increase accessibility for patients. To improve accessibility during this response it has become evidence that a gap in knowledge still exists in the nursing profession regarding the use of telehealth services and best clinical practices in remote settings. To improve these outcomes the nursing profession must become more aware of the knowledge and skills that are necessary to provide safe quality care using telemedicine. To narrow this gap in knowledge a TEM will be designed and proposed to provide the knowledge, data, and evidence necessary to meet the aim of the proposed outcomes of increasing the knowledge of nurses about telehealth services and patient safety to improve the quality of care, thus decreasing the overall cost of care. This proposal is designed to provide knowledge to support this process.

Section 4: Findings and Recommendations

Introduction

The TEM in this project was aimed at improving the knowledge of clinical providers about patient safety in telemedicine encounters. According to Ayatollahi et al. (2015) 96.1% of providers surveyed reported having little to no knowledge of telemedicine services. According to Beusekom (2020), 85% of providers reported using telehealth services compared to 6% telemedicine prior to the COVID-19 pandemic. In addition, Beusekom (2020) reported telehealth claims filed went from 200 pre-pandemic to 38,000 per day, with no-show rates for appointments falling below 10% since the implementation of telehealth services. These findings indicate the COVID-19 pandemic has changed the use of telemedicine, and more clinicians have more knowledge than what the literature supports, which is mostly pre-pandemic literature.

The TEM is aimed at improving outcomes at the population level by providing new knowledge about how to increase patient safety in the telemedicine environment by using and applying a two-step process of patient verification with two identifiers—name and date of birth—and conducting a medication reconciliation process to decrease polypharmacy and medication errors. In addition, imploring a medication reconciliation can decrease the cost of care while improving the overall health of patients at the population level.

The driving force behind the TEM was to narrow the gap in knowledge that existed among nurses and clinicians as evidenced by the literature. Of those clinicians and nurses who reported a gap in knowledge, it was attributed to lack of formal training

and exposure on the job and in the preprofessional education training. Most of the gap in knowledge was related to processes, patient safety, and the overall understanding of how to use telemedicine to complete patient visits. In addition, a low knowledge among providers regarding telemedicine exists globally; 70% of providers surveyed in a Saudi Arabian study stated they had low knowledge about telemedicine due to barriers, such as concerns about patient privacy, lack of adequate training, and lack of equipment (Albarrak et al., 2021). With global issues causing an increase in telehealth usage, more staff education should be implemented to improve outcomes for patients locally and globally. To improve the gap in knowledge, I designed and developed a staff education project or TEM to answer the DNP practice-focused question.

The TEM was conducted online. The pretest survey was opened on April 27, 2021, at 1:00 p.m. eastern standard time, and an email was sent via SurveyMonkey to 37 subjects. The TEM was to be viewed after the taking the pretest. A secondary SurveyMonkey email was sent to 37 subjects after they reviewed the TEM. The 37 subjects were sent survey requests via SurveyMonkey with the request for both the pretest and the posttest with a link to the TEM. The survey stayed open for 10 days and subjects and responses were received from the SurveyMonkey email requests. Of the 37 email requests sent out from SurveyMonkey for the TEM pretest, five participants responded. Of these five participants, the scores ranged from 50% to 100% with an average score of 92%. Requests were sent from SurveyMonkey to 37 potential participants to complete the posttest, and five participants responded with the following results: an overall average score of 100%. The results were analyzed and because there

was the same number of subjects in the pretest and the posttest, there was no reason to believe there had been a human error or subject sampling error where one of the respondents' data was lost to computer or data sampling errors. However, there is still enough information from the subjects and respondents to draw a conclusion that the aim of the study and learning objectives of the TEM were met when comparing the pretest and posttest results. A percentage or raw score was analyzed using the BWCE to prove that statistical evidence exists to support that a gain in knowledge was evidenced among participants when comparing the pretest results to the posttest results, which was expected. If all participants followed the instructions and recommendations of the study, these data reveal and support that a gain in knowledge exists among participants who viewed the TEM, when statistically analyzing and comparing the pretest and posttest scores and the findings from the study itself.

Findings and Implications

The findings indicate a change in the numerical value of the pretest and posttest scores among most participants. However, there was some variance in the responses. The findings reveal that not all participants completed the pretest and posttest, and only three participants completed both the pretest and the posttest. Of the subjects who correctly completed both the pretest and the posttest, there was no change in scores; all participants scored 100% on both the pretest and posttest.

When using the BWCE Level Two Data Calculation Method (post-learning score – pre-learning score / maximum score – pre-learning score) X 100. For example, (100 – 100/100) x 100 = 0; as expected, there was no change, which indicates the three

participants had no gain in knowledge. Of the three participants who took the pretest and posttest, the results could be attributed to participants' many years of practice as a medical doctor and not a nurse.

The overall results when compared show the following findings using the BWCE Level Two Data Calculation using the overall scores of the pretest and posttest as a whole: –8% change in knowledge due to human error as the same respondents who completed the pretest and posttest were not the same subjects; two participants who completed the pretest did not complete the posttest; and two participants who completed the posttest did not complete the pretest. This is a sampling error or human error that impacts the results of the data, leading to a negative result.

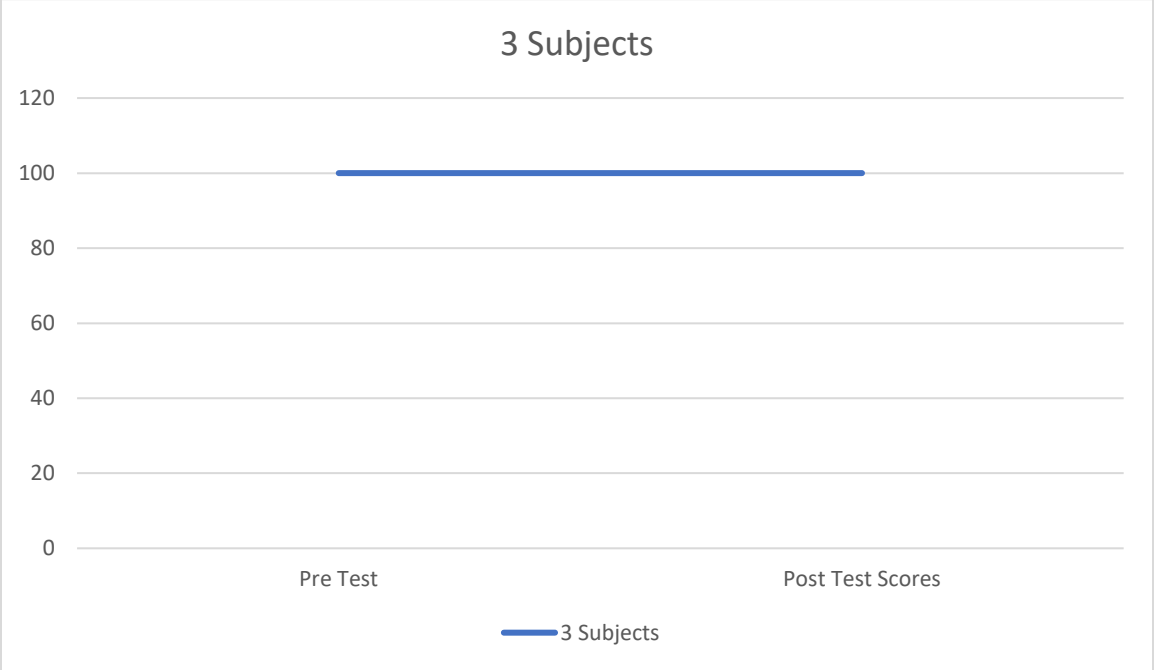
Outliers were identified as to why the statistical variant indicated a negative change, and the results of the final pretest and posttest results have eliminated the four participants who did not complete the pretest and posttest, which indicated that only three of the subjects were able to complete the study. As a result of this error, there was no statistical significance from the scores, as the average pretest scores for these subjects was 100% on the pretest and 100% on the posttest.

These findings limit the significance of the study and assert the need for further studies. However, there is valuable evidence in these data as they indicate that there is some change in the knowledge level of providers post-pandemic versus pre-pandemic, which was supported in the literature review. This gain in knowledge, which is different from the evidence, indicates there has already been a change in the gap in knowledge

prior to the implementation of the TEM. However, the value in knowing that the knowledge gap has decreased can be a valuable supportive outcome of this study.

Figure 1

Comparative Graph of Pretest and Posttest Scores



Recommendations

The results of this study can provide valuable data for future recommendations for practice and future recommendations for replicated or similar studies aiming to advance the profession of nursing. In addition, studies aimed at increasing the knowledge of nurses and providers about the concept of telemedicine and patient safety can also be drawn from results of this study. While the results and responses in this study were more minute than expected, some valuable conclusions can be made from the data collected and analyzed. The findings do support that a TEM is effective at increasing the knowledge of nurses and providers about the concepts of telemedicine and patient safety.

The knowledge level of providers was higher than expected, and the gap in knowledge was lower than expected. This offers some valuable data and recommendations for future studies.

Contribution of the Doctoral Project Team

The doctoral project team consisted of the Committee Chair, the 2nd Committee Member, the URR, and the DNP student. The doctoral Project Team was supported by the Walden IRB, the Walden Writing Center, and the Walden Research Department, and the Walden Library to develop the final products of the study that will be further disseminated as planned.

A second contributing aspect of the Doctoral Project Team is their involvement in the development and design phases of the DNP Project Implementation throughout all stages of the Project from the beginning to the end. This process was supported through mentoring, advising, editing, and revising the DNP Project or TEM collaboratively between the DNP Project Team, the support teams and the partner organization that allowed the study to be implemented within their organization which cannot be named due to anonymity.

Finally, the final product of the TEM is the collaborative effort the DNP Student, the DNP Project Team, the partner organization, and Walden University (the Walden IRB, the Walden Writing Center, and the Walden Research Department, and the Walden Library).

Strengths and Limitations of the Project

With any study or project there is always extreme value in reflecting on the strengths and limitations of study to support the advancement and development of the profession of nursing. The strengths of a study can add value and insight into the describe problem or issue while helping to pave the way for future studies that may later be replicated after the DNP Project. In contrast, the limitations of a study or project can help guide future studies by dissemination findings that would eliminate any future potential barriers or negative outcomes of further replicated studies like the telemedicine education module (TEM).

There were several strengths of the TEM DNP Project study that are useful and valuable for future nursing practice. One strength that can be stated and supported from the results of the TEM DNP Project is that this type of staff education project can be effective at gaining data about the knowledge and skills of nurses and providers about the concepts of Telemedicine and Patient Safety at this current time which is supported in the pre and post test scores of the 5 subjects, which when compared show a post-test value of 100 percent and pre -test value of 92 percent with a negative difference that could indicate a sampling error as described above. Furthermore, after correcting this data the pre and post test scores were the same at 100 percent indicating that the knowledge of most providers has improved and narrowed because of the pandemic and changes to pre professional programs and on the job experience and training because of daily practice and use of Telemedicine.

The limitations of the study are reflected in the small sample size. A small sample size can make it more difficult to calculate the strength of a subject (Hackshaw, 2008). However, in contrast a small samples size can make a study easier to be completed in a shorter time frame which is beneficial in some instances (Hackshaw, 2008). The 3 subjects who completed the pre and posttest, while 4 subjects did not complete the pre and the post test. 2 subjects completed the pretest, and 2 subjects completed the posttest only. As a result of this sampling or human error the results of these pre and posttests limit the ability to apply that a gain in knowledge existed or that there is any value in these findings making the findings for this study limited due to a small sample size and the sampling error or human error that occurred during the study implementation phase. As a result of these findings more emphasis should be placed on outcomes and interventions that engage the subject to participate such as offering a reward for participation in the study and follow up to ensure that a pre and posttest is completed. Further studies and data could prove to be useful if the limiting small sample size of the 37 subjects was increased and further expanded later which could be used for a PHD study.

Section 5: Dissemination Plan

A dissemination plan is key to a successful outcome in staff education projects like this TEM. The dissemination of findings starts with a review of the aim of the study and a review of the learning objectives posed to each subject who completed the TEM. A projected plan for dissemination involves the following plan: First, a defense presentation will be developed for review by the committee and project team prior to final chief academic officer approval, which will be the first platform to disseminate findings within an academic environment. Next, a final step in the dissemination of findings will occur after final chief academic officer approval when the study is uploaded into TaskStream and approved for potential publication. The study will be presented for final consideration and sent to at least one potential nursing journal or publication for consideration for publication. The final project will be offered for presentation at local professional nursing organizations or during networking opportunities such as professional development conferences.

The aim of the TEM was to collect and analyze data after completing a TEM or staff education project aimed at increasing the knowledge of providers and nurses about telemedicine and reviewing ways to increase patient safety using a two-step process of verification (verifying date of birth and name) and completing a medication reconciliation (verifying patients' medications by dose, strength, frequency, and name of each drug). This two-step process will increase patient safety while decreasing the cost of care in the virtual environment during telemedicine encounters. In addition, this two-step process will encourage social change by increasing the accessibility of healthcare to those

who otherwise would be unable to access services due to transportation issues, being homebound due to physical limitations, or other impairments.

In addition to lack of knowledge related to telemedicine, other factors affect the adoption of telemedicine; one of those is geographical location. For instance, according to Chen et al. (2020), providers in rural areas are less likely to adopt telemedicine or telehealth services than those in urban areas. Chen et al. (2020) cited a higher number of healthcare systems and providers reporting usage and adoption of telemedicine and telehealth services in more metropolitan areas with urban cities compared to micropolitan areas.

Analysis of Self

This process has challenged my perspective on creating an evidence-based intervention and study that can advance the profession of nursing by creating social change and moving the underpinnings of scientific nursing research forward. This process helped me identify how I have grown as both a researcher and professional nurse. I have also learned methods and processes to analyze my own self-evaluation as it relates to the completion of this study and my professional nursing practice. Several methods can be used to accomplish the self-evaluation process with the completion of this TEM being the most supportive piece of evidence to support the process of self-analysis. Self-analysis involves the process of reviewing, analyzing, and understanding the completion and steps and processes that led to the TEM as it exists today in its final state.

This study revealed that the aim of my project was valuable to the profession of nursing and that a slight degree of advancement could be supported by the data collected

and analyzed. However, there were significant limitations in the sample size and responses of the participants, which resulted in higher-than-expected levels of knowledge regarding the concepts of telemedicine and patient safety.

Summary

The aim of this TEM was to increase the knowledge of nurses and providers about best practices in telemedicine. The aim of the TEM was to collect and analyze data after completing a staff education project aimed at increasing the knowledge of providers and nurses about the concept of telemedicine while reviewing ways to increase patient safety using a two-step process of patient verification (verifying date of birth and name) and completing a medication reconciliation (verifying patient medications by dose, strength, frequency, and name of each drug). This two-step process will increase patient safety while decreasing the cost of care in the virtual environment during telemedicine encounters. In addition, the aim of this two-step process was to create social change by increasing the accessibility of healthcare to those who otherwise would be unable to access services.

Finally, the findings of the study are supportive that the knowledge gap of providers and nurses has already narrowed as a result of the COVID-19 pandemic. However, evidence still supports a lack in the development of a conceptual guide and theoretical framework to support the use of telehealth and telemedicine in the nursing profession (Nagel & Penner, 2016). While there was no gain in knowledge from the TEM, there was not negative loss of knowledge, and valuable weight can be given to the findings that support that participants are more knowledgeable than expected about the

concepts of telemedicine and patient safety and that the perceived lack of knowledge was not as evident as expected. In contrast, more insight into this gain in knowledge could be useful for the design and development of future DNP Projects like this staff education project.

References

American Association of Colleges of Nursing. (2006). *Doctor of nursing practice*. https://www.aacnnursing.org/DNP/DNP-Essentials.

Albarrak, A. I., Mohammed, R., Almarshoud, N., Almujalli, L., Aljaeed, R., Altuwaijiri, S., & Albohairy, T. (2021). Assessment of physician's knowledge, perception, and willingness of telemedicine in Riyadh region, Saudi Arabia. *Journal of Infection and Public Health, 14*(1), 97–102. https://doi.org/10.1016/j.jiph.2019.04.006

American Nurses Association. (2021). ANA/AONE principles for the collaborative relationships between clinical nurses and nurse managers. https://www.aonl.org/sites/default/files/aone/collaboration-clinical-nurses-principles.pdf

Ayatollahi, H., Sarabi, F., & Mostafa, L. (2015). Clinicians' knowledge and perception of perception of telemedicine technology. *Perspectives in Health Information Management, 12*(Fall), 1–15.

Beusekom, M. (2020). COVID-19 reveals telehealth barriers, solutions. *Center for Infectious Disease Research and Policy, University of Minnesota*. https://www.cidrap.umn.edu/news-perspective/2020/05/covid-19-reveals-telehealth-barriers-solutions

Castellucci, M. (2019). Using telehealth to conduct medication reconciliation. *Care Delivery, Modern Healthcare*. https://www.modernhealthcare.com/care-delivery/using-telehealth-conduct-medication-reconciliation

Centers for Disease Control (CDC). (2020). https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/telemedicine.html

Centers for Disease Control (CDC). (2020). COVID-19: Telemedicine – What does it mean and why should you care? | CDC

Chen, J., Amaize, A., & Barath, D. (2020) Evaluating telehealth adoption and related barriers among hospitals located in rural and urban areas. *Journal of Rural Health, 2020,* 1–11. https://doi.org/10.1111/jrh.12534

CMS (Center for Medicare and Medicaid). (2020). Medicare Telemedicine Health Care Provider Fact Sheet: Telehealth. March 17th, 2020. Cms.gov

CMS (Centers for Medicare and Medicaid). (2020). Telehealth Services: MLN Booklet.

FSMB. (2018). Model policy for the appropriate use of Telemedicine Technologies in the practice of medicine. www.fsmb.org.

Hackshaw, A. (2008). Small studies: strengths and limitations. *European Respiratory Journal, 32*(5), 1141–1143. https://doi.org/10.1183/09031936.00136408

Hewitt, T., Chreim, S., & Forster A. (2016). *Double checking: A second look. Journal of Evaluation in Clinical Practice, 22*(2), 267–274. https://doi.org/10.1111/jep.12468

Hong, Z., Li, N., Li, D., Li, J., Li, B., Ziong, W., Lu, L., Li, W., & Zhou, D. (2020). Telemedicine during the COVID-19 pandemic: Experiences from Western China. *Journal of Medical Internet Research, 22*(5), e19577. https://doi.org/10.2196/19577

Kearsley, G. (2010) Andragogy (M.Knowles) The theory Info practice database. (retrieved from Pappas , 2013).

McCluskey, A., & Middleton, S. (2010). Delivering an evidence-based outdoor journey intervention to people with stroke: Barriers and enablers experienced by community rehabilitation teams. *BMC Health Services Research, 10*(1). https://doi.org/10.1186/1472-6963-10-18

Nagel, D. A., & Penner, J. L. (2016). Conceptualizing telehealth in nursing practice: Advancing a conceptual model to fill a virtual gap. *Journal of Holistic Nursing, 34*(1), 91–104. https://doi.org/10.1177/0898010115580236

Pappas, C. (2013). The adult learning theory—andragogy—of Malcom Knowles. *eLearning Industry*. https://elearningindustry.com/the-adult-learning-theory-andragogy-of-malcolm-knowles

Rutledge, C., Kott, K., Schweickert, P., Poston, R., Fowler, C., & Haney, T. (2017). Telehealth and eHealth in nurse practitioner training: Current perspectives. *Advances in Medical Education Practice, 8*, 399–409. https://doi.org/10.2147/amep.s116071

Smith, T., McNeil, K., Mitchell, R., Boyle, B., & Ries, N. (2019). A study of macro-, meso-, and microbarriers and enablers affecting extended scopes of practice: the case of rural nurse practitioners in Australia. *BMC Nursing, 18*(1), 14. https://doi.org/10.1186/s12912-019-0337-z

Walden University. (2019). *Manual for staff education: Doctor of nursing practice: DNP scholarly project* (pp. 1–12). In-Service Education.

White, K., Dudley-Brown, S., & Terhaar, M. (2016). *Translation of evidence into nursing and health care* (2nd ed.). Springer Publishing.

Appendix A: Learning Objectives

1. The clinician will demonstrate a gain in knowledge about patient safety after completion of the TEM.
2. The clinician will be able to identify why conducting a medication reconciliation during every patient encounter increases patient safety after completing the TEM.
3. At the end of the Telemedicine Education Module the learner will be able to identify barriers and challenges associated with Telemedicine.
4. After completing the Telemedicine Education Module, the learner will be able to identify ways to increase patient safety.

Appendix B: Pretest and Posttest

Each question is a multiple-choice question with four answer choices. Read each question and choose the ONE best answer. Please answer all questions.

1. Patient safety can be increased during Telemedicine patient encounters by verifying which two pieces of information from the patient:

A . Name only
B. Name and Date of Birth
C. Date of Birth only
D. None of the Above.

2. Medication reconciliation can do which of the following if applied to all Telemedicine Encounters:

A. Decrease cost of care.
B. Increase patient safety.
C. Reduce medication errors.
D. All the above.

3. Telemedicine improves patient outcomes by :

A. Increasing access of care for patients.
B. Decreasing cost of care.
C. All the above.
D. None of the above.

4. Telemedicine includes the use of the following devices to conduct patient visits except:

A. Phones
B. Computers
C. Smart devices, and IPADs.
D. Remote Monitoring Devices.

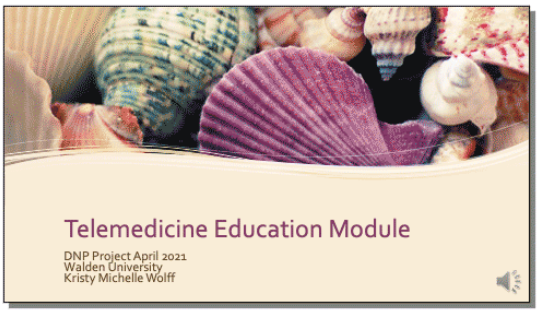
5. Telemedicine has many challenges and barriers which include:

A. Connectivity issues with internet service providers or ISP’s.
B. Limited knowledge about how to use Telemedicine
C. Lack of engagement to adopt the use telemedicine
D. All the above.

6. Telemedicine challenges can also arise due to the following:

   A. Regulatory issues
   B. Reimbursement issues tied to CMS (Centers for Medicaid and Medicare)
   C. Licensure restrictions affecting the ability to practice telemedicine
   D. All the above.

Appendix C: Telemedicine Education Module



Telemedicine Education Module

DNP Project April 2021
Walden University
Kristy Michelle Wolff

Telemedicine

- Telemedicine is defined as the use of telecommunication technologies (phones, computers, mobile monitoring devices) to provide medical care and management of patients in alternative settings (Hong and Ong, 2002).
- Telemedicine has it's risk and challenges for both the provider and the patient and every step must be taken to prevent the risk of any costly or lethal outcome.
- The risk and challenges of Telemedicine can be decreased when evidenced practices are applied using well supported clinical guidelines and tools to guide this process.
- The use of Staff Education Modules and Continuing Education are another solution to improve the knowledge and skills of APRN's and MD's that are providing Telemedicine Services.

Learning Objectives

1. The clinician will demonstrate a gain in knowledge about patient safety after completion of the TEM.
2. The clinician will be able to identify why conducting a medication reconciliation during every patient encounter increases patient safety after completing the TEM.
3. At the end of the Telemedicine Education Module the learner will be able to identify barriers and challenges associated with Telemedicine.
4. After completing the Telemedicine Education Module, the learner will be able to identify ways to increase patient safety.

Telemedicine and Patient Safety

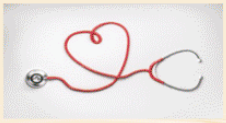
The risk of medical errors and patient compromise is increased in both remote and telephone encounters with patients leading to costly outcomes such as lawsuits, increased patient mortality, and patient injuries, and permanent disability which all lead to a financial burden and hardship for both patients, providers, and healthcare systems.

Evidenced Based Practices must be applied to improve the outcomes associated with quality of care and patient safety in the remote environment while applying best practices in nursing through use of frameworks, models, and tools that have been well validated to guide the process.

TEM Guide and Reference

- To move through the slide-show use the down arrow on the keyboard or hit enter to move through the slides.
- To return to a previous slight hit the up arrow on the keyboard or you can again hit enter to scroll back through.
- Hit escape at anytime to exit the TEM.

Telemedicine Encounters: Risks and Challenges of Care



The use of telehealth services can lead to a higher risk of patient safety if patients are not accurately identified by providers during each encounter. The EBP project is for nurses to apply EBP practices to increase the accuracy and safety of care delivered remotely among patients via telephone triage and or telehealth encounters.

To improve the quality and safety of care nurses will apply best Evidenced Based Practices (EBP) practices by confirming the accuracy of patient demographic data while enhancing the safety by completing medication reconciliation using a checklist or multi-step acronym based step by step process or guide during every patient telephone encounter.

Nurses should be actively engaged and motivated to support the process by using the new EBP methods with each patient encounter via telehealth.

Patient fraud should also be considered in any remote encounter by providers and nurses engaging in remote patient encounters and biometric photo identification should be utilized to the fullest extent possible to mitigate these risky encounters if possible.

Models and Tools to Increase Patient Verification and Accuracy

- Biometric Photograph verification through database or software.
- Photo Camera Verification via patient and provider encounter.
- Verification of Attached photo ID to patient platform.
- When no visual ability to verify patient identity exists the provider should use the following suggested parameters: Verify spelling of name, verify date of birth, verify phone number, gender, and other non photo based identified and then cross reference the information to the electronic medical record when possible.
- Verify the patients current provider by name and title and last date of visit.

Medication Reconciliation

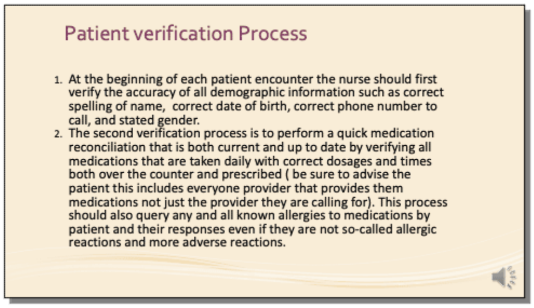
Verify
- Verify all medications that are prescribed by verify the name of the medications and verify spelling.

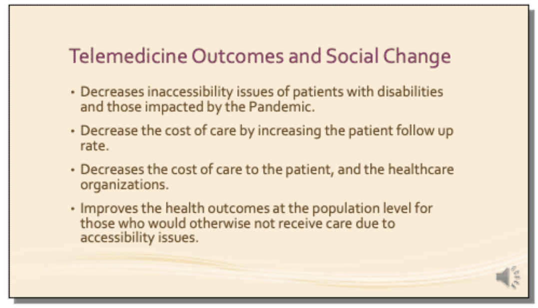
Verify
- Verify dosage of medications.

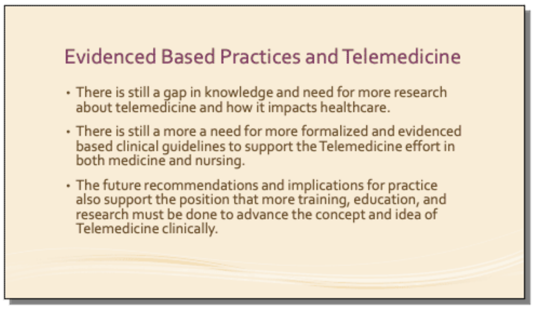
Verify
- Verify route and frequency of daily medications.

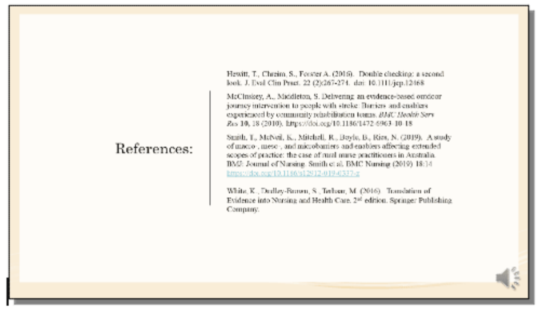
Verify
- Verify if patients are compliant with medications and taking them as prescribed as this can be improvement when triaging patients and solving problems that can result in patient non-compliance.

Verify
- Verify all of the same parameters for all over the counter medications.


Patient verification Process
1. At the beginning of each patient encounter the nurse should first verify the accuracy of all demographic information such as correct spelling of name, correct date of birth, correct phone number to call, and stated gender.
2. The second verification process is to perform a quick medication reconciliation that is both current and up to date by verifying all medications that are taken daily with correct dosages and times both over the counter and prescribed (be sure to advise the patient this includes everyone provider that provides them medications not just the provider they are calling for). This process should also query any and all known allergies to medications by patient and their responses even if they are not so-called allergic reactions and more adverse reactions.


Telemedicine Outcomes and Social Change
• Decreases inaccessibility issues of patients with disabilities and those impacted by the Pandemic.
• Decrease the cost of care by increasing the patient follow up rate.
• Decreases the cost of care to the patient, and the healthcare organizations.
• Improves the health outcomes at the population level for those who would otherwise not receive care due to accessibility issues.


Evidenced Based Practices and Telemedicine
• There is still a gap in knowledge and need for more research about telemedicine and how it impacts healthcare.
• There is still a more a need for more formalized and evidenced based clinical guidelines to support the Telemedicine effort in both medicine and nursing.
• The future recommendations and implications for practice also support the position that more training, education, and research must be done to advance the concept and idea of Telemedicine clinically.


References:
Hewitt, T., Chreim, S., Forster A. (2016). Double checking: a second look. J. Eval Clin Pract. 22 (2):267-274. doi: 10.1111/jep.12468
McCluskey, A., Middleton, S. Delivering an evidence-based outdoor journey intervention to people with stroke: Barriers and enablers experienced by community rehabilitation teams. BMC Health Serv Res 10, 18 (2010). https://doi.org/10.1186/1472-6963-10-18
Smith, T., McNeil, K., Mitchell, R., Boyle, B., Ries, N. (2019). A study of macro-, meso-, and microbarriers and enablers affecting extended scopes of practice: the case of rural nurse practitioners in Australia. BMJ: Journal of Nursing. Smith et al. BMC Nursing (2019) 18:14
White, K., Dudley-Brown, S., Terhaar, M. (2016). Translation of Evidence into Nursing and Health Care. 2nd edition. Springer Publishing Company.