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Educating Clinicians in a Nursing Facility to Proactively Manage Urinary Tract Infections

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Walden University

College of Nursing

This is to certify that the doctoral study by

Setha Joseph

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.

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Walden University

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Abstract

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Infections

By

Setha Joseph

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Project Submitted in Partial Fulfillment

Of the Requirements for the Degree of

Doctor of Nursing Practice

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Abstract

Urinary tract infections (UTIs) have been identified as the most common reason for hospital visits among adults. The Centers for Disease Control and Prevention indicates that the prevalence of UTIs in long-term care facilities ranges from 20%-50%. The purpose of this staff education project was to implement an educational program to increase staff knowledge of proactive management of urinary tract health with the ultimate goal of reducing acute illnesses at the skilled nursing facility (SNF). Knowles theory of adult learning informed curriculum development and Kirkpatrick's levels of training evaluation guided program evaluation. The project team planned, developed, implemented, and evaluated the education program for nursing staff at the SNF. The project included 25 participants and the inclusion criteria were the nurses at the SNF. Data were collected using a pre- and postknowledge-based assessment and satisfaction with a learning survey. Data were analyzed through a paired sample *t* test, and overall, all the observed differences on every question before and after the education intervention were statistically significant ($p < 0.001$). The project findings will inform improved protocols for the management and treatment of UTIs by staff nurses, thus potentially enhancing the quality of life for patients at highest risk for developing UTIs.

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Dedication

This Doctoral of Nursing Practice (DNP) project is dedicated to my Mother who was the source of inspiration and motivation. The desire to give her the best care motivated me to do my best to complete this project. I would like to appreciate my immediate family for giving me a powerful support system. Without their sacrifice and dedication, I would not be where I am today. Although it has been a long journey, they were with me every step of the way.

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Section 1: Nature of the Project

Introduction

Urinary tract infections (UTIs) are among the leading causes of morbidity and comorbidities in patients with already existing conditions (Odoki et al., 2019). According to the Centers for Disease Control and Prevention (CDC, 2019), UTIs are bacterial infections that occur because of the movement of bacteria from the skin or rectum to the urethra, infecting the urinary tract. UTIs can also affect various parts of the body, including the kidney and bladder. The most common infections occur in the bladder and are referred to as cystitis (CDC, 2019). According to Odoki et al. (2019), UTIs are among the primary causes of comorbidities and morbidity and one of the main reasons for hospital visits. The global prevalence of UTIs is estimated at around 150 million persons per year (Sewify et al., 2016). The high incidence of UTIs is associated with ineffective interventions and strategies adopted by healthcare providers that result from flawed policies.

According to Bruschi (2020), UTIs account for over six million patient visits to physicians each year in the United States, 20% of which are to the emergency department. Global statistics indicate that 50% to 60% of adult women experience UTI at least once in their lifetime (Brusch, 2020; Medina & Castillo-Pino, 2019). Medina and Castillo-Pino (2019) also noted that UTIs are among the most common outpatient infections in the United States, with the prevalence increasing with age. Women aged 65 years and above have a prevalence of about 20% compared to 11% in the general

population. At the same time, 50% to 60% of American women will have at least one UTI in their lifetime.

As leaders in the healthcare sector deliberate on improvement strategies, existing policies and regulations have significantly improved medical care access. The Patient Protection and Affordable Care Act of 2010 has increased the affordability and accessibility of healthcare in the country. Additionally, individual healthcare organizations have devised measures to train and educate staff on the usability and implementation of technology to foster patient-centered care (Medina & Castillo-Pino, 2019). Evidence-based practices provide reliable scientific information that can be used by policymakers and healthcare providers to improve care quality (Geerlings, 2016). Despite all these fundamental developments in the healthcare industry, effective management of UTIs remains elusive (Medina & Castillo-Pino, 2019). Given that most of the affected patients are elderly, there is a need for more proactive management of UTIs among elderly patients in skilled nursing facilities (SNFs). The aim of the project was to address the gap in the management and prevention of UTIs among older adults in SNFs through education of nurses in an SNF. The inability to meet older adults' healthcare needs in SNFs is widely acknowledged by healthcare professionals and nursing leadership as a challenge, especially as the elderly population is continually growing. Implementing a proactive nursing intervention strategy could ensure early identification and treatment of UTIs and prevention of related complications to safeguard patients and improve their quality of life while in the SNF.

Problem Statement

In accord with the goals of facility leadership, the targeted problem in this project was the ineffective treatment and management of UTIs among older adults resulting from the lack of adequate knowledge regarding proactive urinary tract health management among nursing staff. UTI symptoms are generally distressing for patients, increasing their risk of complications, including recurrent infections, kidney damage, narrowing of the urethra, and sepsis (Sewify et al., 2016). The prevalence of UTIs in the United States is higher among women, with approximately 10%-20% of this population experiencing symptomatic cases at some point in their lifetime (Meddings et al., 2017). Medina and Castillo-Pino (2019) indicated that the incidence of UTIs increases with age, and about 20% of females aged over 65 years have had the condition. Hutton et al. (2018) indicated that approximately 12% to 15% of newly admitted individuals in nursing homes have an indwelling catheter that increases their risk of UTIs. The high prevalence of UTIs among older adult women necessitates the adoption of more effective strategies.

Research efforts have documented a gap in knowledge of proactive management of UTIs among nursing staff (Meddings et al., 2017). A needs assessment conducted by facility leadership indicated staff at the SNF has inadequate knowledge of proactive UTI management. For this reason, the project was aimed at improving nurses' knowledge of proactive management of UTI to reduce the rate of acute illnesses at the SNF. The project is pertinent to nurses across the world who are charged with improving health outcomes for elderly patients.

Purpose

The purpose of this staff education project was to implement an educational program to increase staff knowledge of proactive management of urinary tract health with the ultimate goal of reducing acute illnesses at the SNF. According to facility leadership, there was a gap in the nursing staff's knowledge of proactive management of UTI, which is associated with the high prevalence of infections. The practice-focused question for the doctoral project was:

PFQ: Within an SNF, will staff education increase knowledge of proactive management of UTI toward the ultimate goal of reducing acute illness?

The project was designed to address the identified gap in the proactive management of patients with UTIs in SNFs. I anticipated that the implementation of an educational intervention focused on proactive management of UTI would reduce the prevalence of the condition at the SNF. Nurse leaders can adopt this project's findings to develop continuous practical training and educational programs for nurses working in SNF settings.

Nature of the Doctoral Project

The purpose of this staff education project was to implement an educational program to increase staff knowledge of proactive management of urinary tract health with the ultimate goal of reducing acute illnesses at the SNF. The target problem is the ineffective treatment and management of UTI among older adults. I collected information for addressing the practice-focused question from peer-reviewed journals from online databases, including PubMed, Medscape, MEDLINE, Cochrane, and PsycINFO. In

addition, I utilized nonconventional publications such as governmental and nongovernmental reports. Findings by organizations such as the CDC and the World Health Organization played a vital role in developing the educational program.

A project team was constituted to plan, develop, implement, and evaluate the education program for nursing staff at the SNF. The approach was consistent with Walden's Staff Development Manual. The curriculum was underpinned by Knowles' (2017) theory of adult education. The curriculum and delivery was evaluated using Kirkpatrick's level of training and evaluation model (Kirkpatrick & Kirkpatrick, 2017). The satisfaction with learning survey and the two assessments (pre- and postknowledge evaluation) was used to answer the practice-focused question. Nursing leadership maintained the responsibility of educating the participants and maintaining control of data. The project team was provided with answer sheets from the educational program for analysis. Only aggregated data were reported. The project's goal was to promote proactive management of UTI patients by educating nursing staff at the SNF. The prevalence of UTIs in nursing homes is associated with inadequate management approaches used in the treatment and has been identified as a concern at the facility where the project was conducted. Hence, there was an identified need for education relative to implementation of proactive measures to facilitate proper anticipation, identification, management, and control of UTIs among elderly patients.

Significance

The stakeholders in the project included groups or individuals connected to the SNF who had an interest in reducing the prevalence of UTIs and could be influenced by

the proposed educational program. The primary stakeholders included older adult patients, nursing staff, the project leader, and administrators at the SNF. Other stakeholders included the patients' family members, insurance companies, and community members. Nurses at the SNF benefited from the improved knowledge of proactive UTI management. The administrators at the SNF benefited from the educational program through reductions in the prevalence of UTI cases and complications.

The project has the potential to contribute positively to nursing practice in long-term care facilities. I intended the project to increase the knowledge and expertise of the nurses in SNFs to manage UTIs effectively. A reduction of UTI among older adult patients could significantly lower the cost of treatment (Hutton et al., 2018). Policymakers could use the project findings as a basis to establish new guidelines on the management of UTIs in SNFs. The project findings demonstrated the significance of proactive nursing management; hence, its implementation as part of mandatory training and education could be valuable for healthcare providers.

I designed the project in a manner that may facilitate the transferability of the educational intervention to other SNF facilities. The use of a pretest-posttest design to address the clinical question facilitated the replication of the project in similar settings. Replicating the educational intervention in other settings could lead to an improvement in the organizational culture associated with proactive management of UTIs.

To introduce positive social change at the SNF, the project must contribute to the creation of a culture of proactive UTI management. The educational intervention created

a positive change by ensuring all nurses at the facility could screen and manage UTI patients proactively. As a result, the nursing staff was able to anticipate and identify the most at-risk patients and ensure that UTIs were addressed effectively. Improved knowledge of proactive management of UTI also promoted social change by reducing the healthcare costs and occurrence of related complications and adverse events.

Summary

UTIs are common among older adult individuals in SNFs and can have adverse effects on their health and quality of life. As a measure to address the prevalence of UTIs in SNFs, a proactive nursing management approach is recommended. The educational intervention was aimed at improving the nurses' ability to adopt effective strategies when managing elderly patients with UTI. The objective was to increase staff knowledge of proactive management of UTI with the ultimate goal of reducing acute illnesses at the SNF. This intervention is expected to ultimately lower the prevalence of UTIs in the facility, where older patients are more susceptible to these infections. It is important to understand the background and context of the problem to support the implementation of an intervention strategy that enhances the management of UTIs in SNFs. Section 2 provides a comprehensive literature review in support of the project and the theoretical foundations that were employed.

Section 2: Background and Context

Introduction

The risk of UTIs increases with age, which makes the elderly population who are 65 years and older most susceptible to infections (Medina & Castillo-Pino, 2019). The prevalent occurrence of UTIs is one indicator of the ineffectiveness of the interventions and standard care practice to lower infection implemented in nursing homes. There is a need for an evidence-based intervention to ensure the safety and well-being of the patients in SNFs. The practice-focused question that guided the project was:

PFQ: Within a SNF, will staff education increase knowledge of proactive management of UTI toward the ultimate goal of reducing acute illness?

The purpose of the staff education project was to implement an educational program to increase staff knowledge of proactive management of urinary health with the ultimate goal of reducing acute illnesses at the SNF. The next sections contain six parts, namely: (a) concepts, models, and theories; (b) relevance to nursing practice; (c) local background and context; (d) role of the DNP student; (e) role of the project team, and (f) the summary.

Concepts, Models, and Theories

According to Ferreira et al. (2016), the nature of nurses' work, which requires focus on the patients' needs and preferences, underpins their role in proactive interventions. The project was guided by Knowles' theory of adult education and Kirkpatrick's four-level training evaluation model (Knowles, 2017). Knowles' adult learning theory that was proposed in 1968 was applied to guide the development of the

educational program. The first assumption of the theory is that adults have a secure self-concept because of their advanced level of maturity. As a result, nurses were involved during the development of the education program as a technique for helping them direct their learning. The second assumption is that adults have diverse experiences that support learning. Thus, the educational program was developed to complement the nurses' experience. The third assumption is based on adults' valuation of education (Knowles, 2017). Similarly, the nurses at the target facility expressed the desire to improve their knowledge as a technique for promoting patient safety.

The fourth assumption is that adult learning is supported by practical reasons (Knowles, 2017). At the SNF, the specific practical reason that supported the need to educate the nurses was their limited knowledge of the proactive management of UTIs, which adversely affects the patients' outcomes. The fifth assumption is that adults learn because they have an internal motivation to gain knowledge. During the development of the educational program, it was assumed that nurses at the facility would voluntarily agree to participate in the proposed project because of their desire to improve patient safety. It was anticipated that applying the theory facilitated the development of a nurse-led educational program that supported their experience, improved the healthcare providers' practical skills, and promoted their ability to manage UTIs proactively.

Kirkpatrick's four-level training evaluation model was first proposed in 1959 (Kirkpatrick & Kirkpatrick, 2017). The model was developed to assess the effectiveness of a training program. The four levels proposed in the model are reaction, learning, behavior, and results. The model was applied to assess the impact of training on the

clinicians' ability to manage UTIs proactively. Particularly Levels 1 and 2 were used in this project. At Level 1, which is the reaction stage, the nurses' engagement was assessed to determine the manner that the training was received. Level 2 focuses on assessing learning. At that level, the knowledge gained by the participants is analyzed. Nurses who participated in the training were assessed to determine the impact of the educational intervention on their ability to manage UTIs proactively.

Relevance to Nursing Practice

The occurrence of UTIs is a prevalent issue that has continued to impact patients' health in nursing homes (Medina & Castillo-Pino, 2019). Approximately 12.6% to 50% of all infections in the SNFs occur as a result of UTIs (Bennett et al., 2016). The prevalence of UTIs is associated with functional incapacity, cognitive impairment, malnutrition, a decline in immune system performance, social health-related factors, and comorbidities, which affect the SNF residents' ability to void their bladders (Jump et al., 2018; Wojszel & Toczynska-Silkiewicz, 2018). The SNF residents' inability to walk is a risk factor for the occurrence of UTIs. Similarly, residents in SNFs often have medical comorbidities such as stroke, dementia, Parkinson's disease, and diabetes that limit self-hygiene and result in bladder-voiding abnormalities, which create the need for urinary catheterization, a well-known risk for UTI (Bardsley, 2017).

De Nisco et al. (2019) indicated that 10% to 15% of women older than 60 years experience recurrent UTIs. Estrogen has a significant role in maintaining urinary continence, especially among women older than 60 years, when the bladder and ureteral function deteriorates (Lo et al., 2019). Thus, low estrogen among older women is

associated with recurrent UTIs (Buck et al., 2020). The treatment of UTIs among the elderly population using antibiotics is often ineffective or poorly tolerated, which creates a need for proactive management of urinary health (De Nisco et al., 2019).

Additionally, the lack of adequate communication and engagement among elderly patients diagnosed with UTIs is a significant challenge in the management of the healthcare problem. The aging process is associated with the occurrence of physiological changes such as cognitive deterioration, which hinder the elderly patients' ability to disclose their conditions (Wojaszek & Toczynska-Silkiewicz, 2018). The occurrence of UTIs results in undesirable clinical outcomes such as increased emergency department visits, inappropriate antibiotic usage, and rise in hospital admissions. In the United States, the economic burden associated with the treatment of UTIs is more than two billion dollars annually (Wu et al., 2020).

Nurses adopt various strategies to combat the prevalence of UTIs in communities. In their systematic review, Meddings et al. (2017) evaluated the strategies used by healthcare professionals to reduce UTIs in nursing home residents. I reviewed 5,794 records, out of which 20 were included in the review. The identified strategies for decreasing UTIs in nursing home residents include proper hand hygiene, prompt removal of the catheter, incontinence care, and enhanced barrier precautions. Meddings et al. (2017) demonstrated that there is no single agreed upon framework in managing and preventing UTIs. However, there are basic interventions that should be implemented to safeguard the patient's health and well-being in SNFs. The general focus for healthcare professionals in SNFs should be on hygiene and reducing the risk factors associated with

UTIs. Kang et al. (2018) discussed the guidelines provided by foreign countries on UTI treatment. The guidelines support that the diagnosis procedures, treatment options, and interventions should be based on the patients' condition and characteristics. The guidelines emphasize the importance of effectively diagnosing and treating UTIs. Conversely, there is limited focus on the prevention of UTIs. The occurrence of UTIs in SNFs is associated with the ineffective adoption of preventive strategies. There is a need to resolve the practice gap, enhance safety, and promote the well-being of elderly patients in SNFs.

Various strategies have been adopted to address the identified practice gap. In their study, Gharbi et al. (2019) found that the use of antibiotics reduces the level of infections in the blood of patients with UTIs. Hence, the project leader recommended the use of antibiotics in combating UTIs in nursing homes. Comparably, Meddings et al. (2017) supported the use of antibiotics as one of the guidelines for managing UTIs. However, Shallcross et al. (2020) found conflicting evidence on the safety of antibiotics. Hence, there is a need to perform additional examinations on the efficacy of antibiotics in treating UTIs. The UTI prevention strategies supported by current literature include proper hygiene and proactive interventions for decreasing the risk of the UTIs from occurring (Meddings et al., 2017; Wojszel & Toczynska-Silkiewicz, 2018).

At the clinical site where the project was undertaken, the current leadership identified that the nurses lacked adequate skills to prevent and manage UTIs among residents in an SNF. Thus, the purpose of conducting the project was to implement an

educational program to increase staff knowledge of proactive management of urinary health with the ultimate goal of reducing acute illnesses at the SNF.

Local Background and Context.

The project was conducted at a SNF in Florida that had more than 20 registered professionals who provided healthcare services to residential patients. The parent facility is home to approximately 1,500 residents and includes a nursing home, assisted living, and a medical center. The nursing leaders and staff in the facility agreed to collaborate and became part of the project team, which was conducted by me. This practicum site was ideal because of the composition of the patients and nursing staff availability.

Individuals over the age of 65 years need close monitoring and supervision because of their lower immune system functionality, which makes them susceptible to bacterial infections. Healthcare services at the project site were conducted in adherence to the same patient safety-related regulations and policies observed in other facilities. Nurses in the facility were obligated by law to adhere to patient safety standards. The facility's strategic vision was to enhance the safety and quality of care to the target patients. The mission was to strengthen preventive measures, safeguard well-being, and improve the patients' quality of life.

Role of the Doctor of Nursing Practice Student

As a healthcare provider, I am tasked with the role of enhancing the patients' well-being by providing quality and safe medical care. Therefore, it is my responsibility to assess, identify, and implement the best practices for improving the patients' outcomes. My role as a DNP student in the project was aimed at providing an educational program

for the nurses and other professionals. I was involved in the evaluation data collection and analysis to establish the quality of the educational program. I led the project team in the development, evaluation, and implementation of the educational program in the SNF. The educational program was developed using credible and high-level evidence, including national guidelines.

My motivation is supported by the need to improve the experiences of patients older than 65 years in the community who are more susceptible to preventable illnesses such as UTIs. The occurrence of UTIs among the elderly aged 65 years and above is common and can become chronic if neglected. Often, the failure to timely treat UTIs leads to functional impairment or death. Individuals older than 65 years need proactive and personalized assistance and protection. Therefore, it is imperative to take radical measures and change how we protect our senior community by empowering front-line workers with the right skills and knowledge.

Role of the Project Team

The project team comprised one assistant, a nurse leader, and experts at the SNF. The task of the assistant was to help with participant engagement and data collection processes. The nurse leader and the nursing staff were involved in developing, evaluating, and implementing an educational program to enhance the skills and knowledge of nurses in the SNF. The nursing leadership was responsible for organizing and planning the implementation of the educational program. The registered nurses were responsible, in accord with leadership requirements, for participating in the educational program to improve their knowledge and skills to provide proactive care to the SNF

residents. The educational program was administered virtually through a presentation application due to the coronavirus pandemic. The nurses received their hourly wage while participating in the project. Participation in the project was voluntary, and the nurses were required to provide informed consent.

Based on the evaluation process, participants completed knowledge-based questions to assess their knowledge and skills pre- and postsession. As the project leader, I was responsible for communications about the project, which was conducted via email. I also conducted the educational program, which was provided in two sessions.

Summary

UTIs are severe health conditions in the country and occur at a high rate among older people. Chronic UTIs can result in death and impairment, which creates a need to implement preventive measures. It was identified that nurses lacked adequate knowledge and skills to proactively prevent and manage UTIs, which increases the probability of them occurring. I expected that an educational program on proactive management strategies could improve the nurses' knowledge and skill to prevent and manage UTIs in the SNF. The aim of the project was to increase the nurses' knowledge and skill level to manage UTIs at the project setting in a SNF in Florida. The project team included an assistant, nursing leadership, and staff at the facility and was led by me. In the next section, analysis and synthesis of evidence related to the educational intervention is provided.

Section 3: Collection and Analysis of Evidence

Introduction

UTIs are more prevalent in older people in SNFs compared to their younger general population (Uwaezuoke, 2016). The susceptibility of older adults to bacterial infections is linked to diminished immune system and other health factors that impair their ability to take care of themselves. Although individuals in nursing homes have access to nurses with professional skills and knowledge, the risk of UTIs remains high in such settings (Hutton et al., 2018). The high prevalence of UTIs is mainly associated with the patients' conditions and the surrounding environment (Medina & Castillo-Pino, 2019). According to Wojszel and Toczynska-Silkiewicz (2018), most individuals in SNFs are older adults with malnutrition, weak immune systems, and other comorbidities, which increase their susceptibility to UTIs.

Evidence shows that nurses in SNFs lack the required skills and knowledge to enhance UTI prevention and control in SNFs (Wojszel & Toczynska-Silkiewicz, 2018). As the aging population increases, so does the prevalence of UTIs. An increase in bacterial infections in SNFs affects the health of the older adult population and increases the cost of healthcare. Thus, a proactive management strategy is required to ensure early detection, prevention, and treatment of UTIs in SNFs, which was the focus of this project. The project leveraged existing evidence from literature and the practicum site to develop an educational program for staff that focuses on implementing effective strategies towards the treatment and management of UTIs in SNFs.

The first part of this section presents a discussion of the planning, implementation, and evaluation process of the intervention. The next section provides an overview of the practice-focused question that guided the project. The section is followed by description of the sources of evidence and analysis and synthesis processes.

Practice-Focused Question

The guiding practice-focused question for the project was as follows:

PFQ: Within an SNF, will staff education increase knowledge of proactive management of UTI toward the ultimate goal of reducing acute illness?

The practice-focused question was aimed at addressing the gap in the management and treatment of UTIs among older adults in SNFs. I expected that the educational intervention would increase nurses' skills and knowledge of proactive management of UTIs, thus reducing the risk of complications. Despite the high prevalence of UTIs among the older adult population in the country, effective management and treatment strategies remain elusive (CDC, 2019). The senior community continues to experience adverse health and socioeconomic consequences due to UTIs in SNFs. One solution to address this gap is by enhancing healthcare professionals' skills and knowledge in SNFs. The recommended intervention would ensure that nurses and other professionals become proactive, allowing them to anticipate, prevent, and control UTIs in vulnerable populations.

The purpose of this staff education project was to implement an educational program to increase staff knowledge of proactive management of urinary health with the ultimate goal of reducing acute illnesses at the SNF. The gap in practice in terms of

proper diagnosis, prevention, and management of UTIs has been highlighted by various studies (Ahmed et al., 2017; Gharbi et al., 2019; Hutton et al., 2018; Jones et al., 2019; Meddings et al., 2017). According to Crnich et al. (2017), improvements in the management of UTIs are more likely to occur through a combination of provider and patient education and careful use of decision support tools to understand their cognitive behaviors better.

Sources of Evidence

The source of evidence for answering the practice-focused question was the pre- and postintervention knowledge assessments. In collaboration with leadership, I developed the assessments using previous literature on proactive management of UTIs. I requested two content experts from the project team to review the assessments before administration. Evidence from the pre- and postintervention assessments helped in addressing whether training nurses on proactive management of UTIs could be effective in minimizing the occurrence of acute illnesses.

A comprehensive literature review of studies on UTIs and the gap in diagnosis, prevention, and treatment offered insights into the background of the target problem and served as a guide for the development of the educational program. In addition, current literature and statistics demonstrate the extent of the problem and the need to implement proactive management of UTIs to minimize the risk of complications. Evidence from these studies was used to emphasize the importance of proactive management of UTI among older adults in SNFs and its strength in reducing the risk of complications and improving quality of life.

The databases used to collect the evidence included PubMed, Medscape, MEDLINE, Cochrane, and PsycINFO. Also, I relied on reports from government and nongovernmental agencies to show trends in UTIs and successful intervention. The search terms used included: *urinary tract infection* [Mesh] or *UTI and prevention or control and management, bacteriuria or cystitis and prevention or control, UTIs in older populations and prevention or control, UTIs prevention strategies in elderly patients, prevalence of UTIs in elderly populations, and treatment of UTIs in older patients.*

Pre- and postintervention data were collected in two phases at the practicum site. The first phase included the collection of the nursing staff's baseline knowledge and self-reported skills on proactive management of UTI among older adults in the SNF. The pre- and postintervention knowledge-based assessment was based on a dichotomous scale. The findings were compared to determine whether there was a statistically significant increase in the participants' knowledge and skills of proactive management of UTIs among older adults at the facility.

Protections

The participants were recruited through email from leadership because of the current coronavirus pandemic. They provided their responses anonymously. The project leader informed them via email sent by leadership about the purpose, benefits, and hazards of participating in the project. The email also included an informed consent form, which was implied during the survey. Participation in the project was voluntary and the participants were free to withdraw at any stage without repercussions. The Walden

University Institutional Review Board approved the project before initiation (approval number 01-13-21-0737206)

Analysis and Synthesis

I conducted data collection before and after the implementation of the educational intervention. The participants completed the knowledge-based assessment before and after the training sessions. The approach was essential to facilitate the tracking of the participants' learning process and analyze the data to assess the effectiveness of the educational program. I used SPSS software version 25 to analyze the data through paired samples *t* test at a 0.05 significance level. I used Kirkpatrick's levels of training to evaluate the educational program and reported in simple descriptive format (Kirkpatrick & Kirkpatrick, 2017). I used the satisfaction with learning survey and pre- and postintervention knowledge-based assessment to address the practice-focused question.

Summary

In the project I sought to address the practice gap in SNFs regarding UTI prevention and management through an educational program. I used evidence collected from pre- and postintervention knowledge-based assessment and peer-reviewed journals to address this gap. The participants completed knowledge-based assessments before and after the educational program. I used a paired sample *t* test to compare the means of the data collected and ascertain whether the changes in the nurse's knowledge and skills were statistically significant.

Section 4: Findings and Recommendations

The risk of contracting UTIs increases with age, which makes the elderly population, 65 years and older, more susceptible to infections (Aloush et al., 2019). The data collected and analyzed in this section of the project were intended to identify whether the current gaps in knowledge related to the diagnosis, management, and treatment of UTIs could be adequately addressed through staff education. To improve the overall well-being of patients within SNFs, nurses need to acquire the knowledge necessary for proactive prevention, screening, and treatment of the vulnerable population. The practice-focused question was: Within an SNF, will staff education increase knowledge of proactive management of UTI toward the ultimate goal of reducing acute illness? Thus, I intended through the doctoral project to implement an educational program to increase staff knowledge concerning the proactive management of UTIs and ultimately reduce the incidences of acute illnesses at the SNF practicum site.

I collected the evidence to support the project and answer the practice-related question through pre- and postintervention knowledge assessments. The knowledge-based assessments were questions that gauged how much nurses knew regarding the anticipation, detection/diagnosis, management, and prevention of UTIs before and after the implementation of the educational program. The data on the staff's baseline knowledge was collected during the initial phase of the project. The second phase assessed whether the intervention improved the nurses' knowledge in addressing UTIs among the elderly. Data from the first and second phases were then compared to

determine whether the observed increase in staff's knowledge was statistically significant per the paired t-test analysis.

Findings

With the doctoral project I evaluated the knowledge of 25 registered nurses at the SNF regarding the management and prevention of UTIs. Among the 25 participants, 40% (10) were male and the remaining 60% (15) were female. Among the selected sample, only five (20%) had less than a year of relevant working experience in an SNF. Six nurses (24%) had between 1 to 2 years of experience in nursing, three (12%) recorded having between 3 to 4 years, and only two (8%) had over 5 years of working experience. The majority of the selected sample, nine participants or 36%, had between 2 and 3 years of experience.

The results from the data analysis suggested that there was a significant average difference between the participants' ability to detect UTI symptoms before and after the implemented intervention ($t_{24} = 10.392, p < 0.001$). The analysis further showed that the nurses' ability to detect UTI symptoms after the education intervention improved by a score of 1.2 (95% CI [0.962, 1.438]). At the specified level of significance (0.05), the noted difference between the first pair obtained through the *t*-test operation was statistically significant, $p < 0.001$. The outcome also indicated that the clinicians' knowledge of the proper screening procedures, on average, was significantly different pre- and postintervention ($t_{24} = 10.382, p < 0.001$). The results of the paired sample *t* test on the second pair of variables also suggested that the nurses' knowledge of UTI screening procedures after the implementation of the education program increased by

1.24 (95% CI [0.993, 1.487]; Table 1). The mean shift in self-reported knowledge regarding UTI screening procedures was statistically significant at a 0.05 significance level.

The third pair to be compared through the paired sample *t*-test operation was the participants' knowledge of the recommended measures for preventing incidences of UTI. The results showed that there was a significant mean difference between the nurses' knowledge of the measures for UTI prevention before and after the intervention was implemented ($t_{24} = 11.066, p < 0.001$). The analysis also indicated that the nurses' knowledge concerning the prevention of new UTI cases improved by an average score of 1.44 (95% CI [1.171, 1.709]). According to the analyzed data, there was also a statistically significant difference between the nurses' knowledge of the recommended UTI treatments pre- and postintervention ($t_{24} = 11.667, p < 0.001$). According to the results, the participants' knowledge of the UTI treatment methods improved by an average of 1.72 (95% CI [1.416, 2.024]). All the observed differences before and after the education intervention were statistically significant ($p < 0.001$).

Table 1

Paired Samples Test

	Paired means		t	Df
	Before intervention	Postintervention		
Ability to detect UTI symptoms among the elderly	3.64 (.860)	2.44 (.651)	10.392	24
Knowledge of screening procedures	3.68 (.852)	2.44 (.821)	10.382	24
Knowledge of preventive measures	3.44 (.712)	2.00 (.645)	11.066	24
Knowledge of recommended treatments	3.56 (.961)	1.84 (.688)	11.667	24

Note: Standard deviations appear in parentheses below the means.

Implications

The obtained results implied that the education intervention improved the overall knowledge on the management and treatment protocols for UTIs. The clinicians' self-reported average score for their ability to diagnose UTI symptoms, especially among older patients, was primarily uncertain. This could be attributed to the relatively few years of practical experience the sample had. Approximately 80%, or 20 of the 25 nurses, had less than 3 years of practice experience. Additionally, UTIs in older patients exhibit different signs and symptoms compared to cases among a younger demographic. Perhaps this meant that even though some of the more experienced nurses could detect symptoms of UTI, they probably could not identify the disease among the elderly patients due to the varying characteristics associated with the condition (Chu & Lowder, 2018).

The results also suggested that the implemented intervention helped increase the participants' knowledge regarding the effective detection of UTI-associated bacteriuria

through screening procedures. There are several reported cases where healthcare professionals have confused asymptomatic bacteriuria for signs of UTI (Hong et al., 2020). According to Hong et al. (2020), asymptomatic bacteriuria refers to the bacteria that exists in urine in the absence of any UTI-related symptoms. This means that such misdiagnoses often lead to the unnecessary prescription of antibiotic treatments among older adults screened for UTIs (Gharbi et al., 2019). The education intervention improved the nurses' knowledge of the UTI screening procedures by a mean score of 1.24 (from an average of 3.68 to 2.44). Therefore, the intervention also helped significantly reduce misdiagnosis instances, which among elderly patients could have fatal outcomes. The results indicated that the clinicians' knowledge of the preventive measures for reducing UTI incidence improved significantly following the education intervention. The findings indicated that the self-reported score improved by 1.44 (from a mean of 3.44 to 2.00). For example, clinicians were educated on the importance of encouraging patients at risk of contracting UTIs to take plenty of water. Taking plenty of water helps to flush out the UTI-causing bacteria when the affected individual urinates, and it helps them do so frequently (Meghana et al., 2021). The intervention also improved the participants' knowledge of the recommended UTI treatments from an average of 3.56 to 1.84 (a mean difference of 1.72). Antibiotics are the most common form of treatment recommended for treating UTIs (Gharbi et al., 2019). The results suggested that the nurses also gained significant knowledge regarding the possible drug interactions associated with the prescribed UTI treatments.

Recommendations

The primary recommendation is to have nurses and clinicians adequately trained on the early detection of UTIs and the most relevant and effective screening procedures. For example, it is important that nurses learn of the different symptoms UTIs may present in separate age demographics. According to Chu and Lowder (2018), even experienced nurses sometimes fail to detect or diagnose UTIs among the elderly due to their different signs and symptoms. The findings of the project suggested that increasing the nurses' knowledge concerning effective UTI detection through screening procedures was beneficial for the reduction of unrequired medication prescriptions.

Strengths and Limitations

The current doctoral project had several strengths. For example, the results of all the paired sample *t* tests yielded statistically significant outcomes indicating that the impact of the implemented education intervention was sufficient to significantly influence practice. Nurses in the SNF are now equipped to enhance quality of care for their patients.

Training and development provide an opportunity for the expansion of knowledge base for all nurses. According to Chaghari et al. (2017), training constitutes an essential factor toward improving efficiency of the healthcare staff and numerous organizations consider it a vital investment that fosters internal promotion, as well as the development and success of organizational objectives. The primary aim for this project was to develop an educational model based on scientific evidence that would help nurses proactively manage urinary health in the SNF.

Due to the difficulty associated with implementing change, the leadership acknowledged that not all nurses would embrace the training initiative. To overcome this hurdle, the SNF plans to require the active involvement of all nurses to stimulate cooperation and subsequently motivation. Thus, effective leadership and the ease for adjusting organizational cultures were required to enable the substitution of current practice with evidence-based practices (see Gesme & Wiseman, 2010). Interprofessional communication and interaction among the nurses was encouraged within the healthcare setting. As a result, the nurses' skills were strengthened through the project that facilitated the acquiring of higher-level knowledge and skills.

Section 5

Dissemination

To disseminate the findings and recommendations of the current project, I considered several modes of dissemination such as publishing flyers, guides, and pamphlets, presentations, social media sites, and organization websites. The final mode of dissemination selected was the publishing of the project findings in pamphlets and flyers. The pamphlets and flyers will be shared among the healthcare professionals at the SNF. According to Sales et al. (2019), patients are highly interested in learning more about their health and diagnosed conditions through educational material provided by their healthcare provider. The patients who receive or come across the pamphlets would also be able to read and comprehend the information conveyed due to the simple language purposefully used. The material could also be easily distributed among patients and their family members from the facility's reception area.

Analysis of Self

As a scholar, working on the project helped me to provide informative content concerning a major health concern. UTIs can be directly linked to comorbidities and morbidities and are responsible for the majority of all hospital visits made by the average individual (Odoki et al., 2019). As a practitioner, the current project enabled me to better comprehend how clinicians, of varying experience approach and address different health-related issues. It was beneficial to learn of other evidence-based treatments for UTIs apart from antibiotics. As the project manager, the investigation allowed me to study or assess medical practice from a different perspective. I learned critical lessons such as time

management and personal responsibility, which can all be applied to the healthcare setting, from my work on the doctoral project. In the future, I would appreciate more opportunities to conduct similar projects to improve practice.

Summary

The doctoral project examined whether the current gaps in knowledge regarding the diagnosis, management, and treatment of UTIs can be adequately addressed through staff education. To address the problem, baseline knowledge of nurses and their self-reported skills were collected for analysis in comparison to the posteducation intervention. The data from the two phases were then compared to determine whether the observed increase in staff knowledge was statistically significant. Results from the analysis indicated that the clinicians' knowledge improved significantly following the education intervention.

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