

THE LIVED EXPERIENCE OF NURSING STAFF IN SKILLED NURSING FACILITIES:
IDENTIFICATION OF URINARY TRACT INFECTION IN RESIDENTS

By

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Annually, 50-70% of skilled nursing facility (SNF) residents receive at least one antibiotic, with up to 75% of those prescribed inappropriately. One-third of the antibiotic prescriptions are ordered to treat urinary tract infections (UTI). Inappropriate antibiotic use may result in avoidable side effects and adverse outcomes, including death. The structure of the SNF and the complex medical conditions of residents present a unique challenge especially when health care providers (HCPs) are typically off-site with limited in-person visits. HCPs in SNFs frequently rely on nursing staff to make observations, recognize changes, communicate, and make recommendations, typically via telephone. The SNF nursing staff member communicating with the HCP, will likely be a licensed practical nurse (LPN). The SNF role of certified nursing assistants (CNAs) and LPNs in identification of UTI and decision-making by registered nurses (RNs), LPNs and CNAs have been vastly understudied. Ascertaining and acknowledging the lived experience of SNF nursing staffs' encounter with residents whom they suspect may have a UTI will improve our understanding of this experience. The purpose of this study was to describe the lived experience of nursing staff as they identify changes in SNF residents that may be indicative of a UTI. Chapter 4 presents a manuscript, published May 2022, of the integrative review which served as the literary foundation for this dissertation. Chapter 5 presents a manuscript, to be submitted for publication, outlining the dissertation study, and providing insight into SNF nursing staff perspectives and their contributions to UTI identification.

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LIST OF FREQUENTLY USED ABBREVIATIONS

CNA.....	Certified Nursing Assistant
C&S.....	(Urine) Culture and Sensitivity
HCP.....	Health Care Provider
LPN.....	Licensed Practical Nurse
NP.....	Nurse Practitioner
PA.....	Physician Assistant
RN.....	Registered Nurse
SNF.....	Skilled Nursing Facility
UA.....	Urinalysis
UTI.....	Urinary Tract Infection

CHAPTER 1: INTRODUCTION

Approximately 1.4 million individuals in the United States (U.S.) are receiving care in a skilled nursing facility (SNF) at one time (Harris-Kojetin et al., 2019). Of these individuals, 50-70% have received at least one antibiotic annually (Centers for Disease Control and Prevention [CDC], 2017). Up to 75% of these antibiotics have been prescribed inappropriately, or without meeting evidence-based diagnostic or surveillance criteria for this population (CDC, 2017; Loeb et al., 2001; Nicolle et al., 2019; Scales et al., 2017; Stone et al., 2012). Inappropriate use of antibiotics may result in adverse outcomes including the development of multidrug resistant organisms such as *Clostridioides difficile* (*C. diff*), symptomatic infection, medication interactions, increased hospitalizations, increased health care costs, and even death (Ashraf et al., 2020; CDC, 2017, 2020a, 2020b; Loeb et al., 2001; Scales et al., 2017). With the older adult (age 65+) population projected to grow to an estimated 77 million by 2034, and most SNF residents falling into this age category, it is expected that the SNF population will continue to increase (U.S. Census Bureau, 2017; Harris-Kojetin et al., 2019). As SNF resident numbers grow, there is potential for an increased number of individuals at risk for adverse outcomes related to inappropriate antibiotic use. Without efficacious intervention, the SNF population may be vulnerable to avoidable complications resulting from suboptimal health care provider (HCP) decision-making.

This phenomenological study explored SNF nursing staff's lived experience when interacting with residents suspected of having a UTI. The goal of this study was to describe their experiences and identify common approaches to SNF nursing staff identification of UTIs.

Philosophical Framework

The philosophical framework guiding this study was that of pure, or transcendental phenomenology. Phenomenology is founded on the ontological position that reality is subjective and varies from person to person (Mack, 2010; Scotland, 2012). The associated interpretivist epistemology posits that knowledge cannot be attained independent of real world experiences, is constructed based on those prior experiences and therefore is subjective (Mack, 2010; Scotland, 2012). Edmund Husserl, the father of phenomenology, believed that pure phenomenology allowed the researcher to transcend or surpass the interpretive stage by allowing the research participant to reflect on their own prior experiences using recall (Husserl, 2017). Husserl believed that, using this *a priori* process, the researcher could study and describe the essential structures of the research participant's acts and subconscious contents (Husserl, 2017; Spiegelberg, 1994). The use of pure phenomenology calls for epoché and eidetic reduction to uncover the true essence, absolute, or origin of a subjective experience (Husserl, 2017).

Epoché, also known as bracketing, is a method used to suspend or set aside one's own experiences or assumptions, thereby allowing the researcher to be free from unverifiable presuppositions during data collection and analysis (Husserl, 2017; Spiegelberg, 1994). Epoché includes deep reflection and thorough documentation of pre-existing knowledge, experiences, and assumptions related to the phenomena under investigation (Husserl, 2017). According to Husserl (2017), setting aside assumptions allows the researcher to analyze the data solely based on the description provided by the research participant. In transcendental phenomenology, the research participant is considered a co-researcher, providing a description based on reflection of their own experience. Due to the qualitative nature of this approach, the researcher must

consistently use epoché, keeping detailed documentation of the process, so as not to interpret or construct their own biased meaning of the data.

Eidetic reduction is a systematic process of analysis that is time intensive, void of interpretation, and incorporates constant use of epoché (Husserl, 2017; Spiegelberg, 1994). According to Husserl (2017), epoché involves the researcher setting aside pre-suppositions and removing oneself from the phenomenon under study, as would a scientist in any other field, such as a mathematician or geometer. The researcher must immerse oneself in the data to intuit the pure essence of the object under study.

In this phenomenological study, the researchers immersed themselves in the SNF nursing staff's descriptions of the phenomena by taking part in the interview process, transcription, and the repeated reading of transcripts. The definition of phenomenon is the “appearance” of an object, thing, and/or event (Husserl, 2017). The phenomena under study were the unique environment (SNF), population (nursing staff) and event informing patient care (identification of UTI).

The use of pure phenomenology allows the researcher to uncover the subjective experience, which is the source of all objectivities (Spiegelberg, 1994). Between the participant's description and researcher's use of eidetic reduction, the lived experience is systematically unraveled (Husserl, 2017). In this study, the use of epoché and eidetic reduction allowed the researchers to uncover a rich description of the phenomenon as it is experienced by the participants.

Specific Aims

The purpose of this study was to use Husserl's transcendental phenomenological approach to describe the lived experience of nursing staff as they identified changes in SNF residents that were indicative of a UTI. To accomplish this goal, the following aims were identified:

Aim 1: Describe the lived experiences that contribute to nursing staff member's actions related to identification of UTIs in SNF residents.

Aim 2: Delineate common approaches that nursing staff use in the identification of changes which they suspect to be representative of a UTI in the SNF setting.

By meeting these aims, we have a better understanding of the nursing staff experience as it relates to identification of UTI in SNF residents.

Description of the Manuscripts

Manuscript 1: Nursing Staff's Role in Detecting Urinary Tract Infection in Nursing Homes: An Integrative Review

Manuscript 1 serves as Chapter 4 and is an integrative review of existing literature conducted to establish a foundation for the dissertation study. The background, methods and results are provided in Chapter 4. Most decision-making in the literature at the time of the integrative review was focused on HCPs and little was understood about nursing staff role in the identification of UTI. Manuscript 1 was published in the peer-reviewed *Journal of Gerontological Nursing* (Delgado, et al., 2022) and the publisher has agreed to the use of the final draft in the dissertation (Appendix A).

In Manuscript 1, the term ‘nursing home’ (NH) is used, while the term 'skilled nursing facility' is used throughout the remainder of the dissertation. For the integrative review, researchers chose to use the term NH as it encompasses a broader range of facilities. In North Carolina, all SNFs fall under the classification of NH, but not all NHs provide skilled nursing services and therefore are not classified as SNFs. With Manuscript 1 already being published, the use of NH could not be altered to align with the rest of the dissertation.

Manuscript 2: Taking Charge and Flexing Protocols: A Qualitative Description of SNF Nursing Staff's UTI Identification

Manuscript 2 serves as Chapter 5 and reports the results of the qualitative descriptive study conducted for the dissertation. Using a phenomenological approach, this study provided insight into SNF nursing staff experiences and decision-making related to UTI identification.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

With the use of antibiotics in the older adult population already presenting a national and global health crisis (CDC, 2017; World Health Organization, 2014), the development, dissemination, and implementation of efficacious interventions to improve antibiotic use are essential. In the SNF, the initiation of antibiotic therapy often begins with assessment and report to the HCP by the nursing staff; however, a review of the literature revealed little explanation of this important component of antibiotic prescribing. For the purposes of this study, UTI will serve as proxy for antibiotic stewardship practices because UTI diagnosis encompasses one-third of all antibiotic prescriptions in the SNF (CDC, 2017). In the unique environment of the SNF, analyzing the critical descriptions of UTI identification by the nursing staff can contribute to greater understanding of factors and/or processes potentially impacting the HCP's prescriptive decision-making process.

A UTI is a symptomatic or asymptomatic bacteriuria infection that meets National Safety Healthcare Network surveillance guidelines (CDC, 2021). A UTI occurs most commonly in the bladder, causing cystitis, and is the result of bacteria entering the urinary tract, multiplying in number, and causing infection (Ashraf et al., 2020; CDC, 2019). A UTI may occur in the presence (catheter-associated) or absence of an indwelling urinary catheter (Ashraf et al., 2020; CDC, 2021). Symptomatic bacteriuria is evidenced by a positive urine culture and localized signs, or symptoms associated with infection of the urinary tract (Cortes-Penfield et al., 2017; Loeb et al., 2001; Stone et al., 2012). Asymptomatic bacteremic UTI is evidenced by absence of symptoms localized to the urinary tract however the same organisms associated with symptomatic infection may be present in urine or blood cultures (indicating sepsis) (CDC, 2021).

According to existing diagnostic and surveillance criteria, signs and symptoms of lower UTI include dysuria, gross hematuria, new or worsening urinary incontinence, frequency, or urgency, or suprapubic tenderness (Ashraf et al., 2020; Loeb et al., 2001; Stone et al., 2012). Symptoms of more severe upper UTIs, such as pyelonephritis, may include flank/back pain, fever, chills, nausea and/or vomiting (Ashraf et al., 2020). Evidence-based practice guidelines emphasize the importance of thorough assessments to determine the presence or absence of symptoms related to the genitourinary tract prior to ordering a urinalysis and culture, and making diagnostic and treatment decisions (Ashraf et al., 2020; CDC, 2017).

Inappropriate use of antibiotics occurs when asymptomatic bacteriuria, not meeting surveillance or diagnostic criteria, is treated or when symptomatic infection is treated with the incorrect antibiotic, dose, or duration (CDC, 2017; Loeb et al., 2001; Stone et al., 2012; van Buul et al., 2018). Asymptomatic bacteriuria, or the colonization of the urinary tract with bacteria without signs of infection, occurs in up to 50% of SNF residents therefore, routine testing and/or treatment is not recommended until symptoms present (Nicolle et al., 2019; Vance, 2013). Despite these recommendations, treatment of asymptomatic bacteriuria is all too common (Ashraf et al., 2020; Nace et al., 2018; Nicolle et al., 2019). Prophylactic antibiotic use is also not recommended and contributes to the development of adverse outcomes (Ricchizzi et al., 2018; Tandan et al., 2019).

When treatment is initiated in the absence of a urine culture, or prior to receipt of the results, incorrect antibiotics may be prescribed (Nicolle et al., 2019). Urine culture results can identify resistance, or lack of susceptibility of the causative organism, to the prescribed antibiotic (Cortes-Penfield et al., 2017). In some cases, the antibiotic is determined to be ineffective based on the urine culture results, but the treatment continues, thereby further increasing the risk of

creating multi-drug resistant organisms (Bista & Champion, 2019; Lemoine et al., 2018; Norman et al., 2014). Inappropriate antibiotic use of the incorrect dose or duration refers to over-medication or under-medication based on current recommended evidence-based guidelines (Lemoine et al., 2018; Norman et al., 2014). An example would be the use of a higher or lower dose of the antibiotic and/or prescribing the duration of use for shorter or longer time frames than recommended.

It is important to understand what makes the SNF setting so unique in relation to inappropriate antibiotic use. Residing in a SNF, even short-term, disproportionately increases an individual's risk of adverse outcomes related to antibiotic use, even if they are not the one consuming the antibiotic (Office of Disease Prevention and Health Promotion, 2018).

Individuals residing in a SNF, also known as SNF residents, or simply as residents are those meeting Medicaid's SNF level of care definition and receiving either long-term or short-term assistance with any of the following: physical therapy, occupational therapy, activities of daily living, or skilled nursing services requiring a licensed nurse (North Carolina Medicaid Division of Health Benefits, 2020).

Much of the care provided to SNF residents is provided by nursing staff (Harris-Kojetin et al., 2019; McElligott et al., 2017). When prior studies reference nursing staff, the registered or professional nurse (RN) is often the only role directly identified (Fleet et al., 2014; Lemoine et al., 2018; Petttersson et al., 2011). However, the culture and staff composition of the SNF varies from other healthcare settings, with the certified nursing assistant (CNA) and licensed practical nurse (LPN) most often providing daily care to the resident. The RN may only be in the facility one shift per day (8 hours) or not directly at the bedside (Harris-Kojetin, 2019; North Carolina Division of Health Services Regulation [NC DHSR], Nurse staffing requirements, 2016). For

the purposes of this study, the term nursing staff refers to CNAs, LPNs, and RNs. These certified or licensed individuals are hired by SNFs to provide daily care to residents (Reference MD, 2012).

CNAs are certified, registered and regulated by their state's department of health and human services (North Carolina Department of Health and Human Services [NC DHHS], 2021). CNAs are usually trained in a community college, continuing education program, or other state-approved program (NC DHHS, 2021). Length of training required varies by state and is focused on ensuring that CNAs are competent to assist the licensed nurse in the provision of care to clients in accordance with the state's nursing practice acts (McMullen et al., 2015). CNAs, as unlicensed assistive personnel have limited responsibilities, a specific scope of practice that includes assisting with the activities of daily living, restorative care, maintaining safety, and obtaining vital signs (McMullen et al., 2015). Additional tasks may fall within the scope of practice, depending on the state.

LPNs are licensed nurses regulated by their state's board of nursing and are required to successfully complete an accredited diploma or certificate program of study and a national licensure examination (NCLEX-PN) (North Carolina Board of Nursing [NC BON], 2022). LPN practice settings are primarily long-term care facilities or outpatient settings. The LPN role is a dependent, supportive role, which is designed to assist the RN in provision of nursing services (NC BON, 2018). LPNs must practice under the supervision of an RN or another HCP (NC BON, 2018).

RNs are licensed nurses regulated by their state's board of nursing and are required to successfully complete an accredited diploma, community college or university nursing program and a national licensure examination (NCLEX-RN; NC BON, 2022). RNs may practice in a

wider range of settings as compared to LPNs, including acute care hospitals, SNFs, primary care and other community-based settings (NC BON, 2018). The RN is prepared to practice with a level of autonomy, and tasks include comprehensive assessments and care planning (NC BON, 2018, 2020).

HCPs include physicians, physician assistants (PAs) and nurse practitioners (NPs). Physicians and PAs have specific medical education and training and must complete national licensure examinations regulated by state medical boards (Centers for Medicare and Medicaid Services [CMS], n.d.). NPs complete an accredited nursing program of study and are regulated by their state board of nursing and, in some states, by the state medical board (American Nurses Association, n.d.; CMS, n.d.). HCPs have the legal authority to diagnose infection and prescribe antibiotics (Bista & Champion, 2019; Norman et al., 2014). PAs and NPs may be employed to deal with focused daily or weekly resident care (ongoing care or acute changes) (Shield et al., 2014). SNF medical directors and physicians may be employed by the SNF or be contracted along with other HCPs from their medical practice group to provide medical oversight (Shield et al., 2014).

Although all previously mentioned roles play an integral part in the decision-making process related to the identification of UTIs in the SNF, their contributions are not proportionately represented in the literature. The following review will provide an overview of existing literature on the subject.

Literature Review

The culture of the SNF is unique, in part due to its structural and environmental components, as well as its administrative and staff composition (CDC, 2020b; Delgado et al., 2022; Harris-Kojetin et al., 2019; McElligott et al., 2017). The culture created by the communal

living arrangements and relationships established between the nursing staff and residents vary from the acute care and ambulatory settings (McElligott et al., 2017). SNF nursing care is increasingly complicated by residents presenting with higher acuity needs, in part due to increasing medical comorbidities, cognitive impairment and a systemic shift from hospital-based care to community-based care (Lateef, 2018; McElligott et al., 2017).

An integrative review of 19 articles by Delgado et al. (2022) identified that studies on the topic of UTIs in the SNF setting tend to be quantitative in nature and focus on rate or prevalence of infection or the HCP's prescriptive decision-making. Although HCPs are responsible for diagnosing UTIs and prescribing antibiotics in the SNF setting, they are usually off-site, contacted by telephone, and depend on information from nurses to make their decisions (Bista & Champion, 2019; Delgado et al., 2022; Fleet et al., 2014; Norman et al., 2014; Pettersson et al., 2011; Rummukainen et al., 2012; Tark et al., 2020). Delgado et al. (2022) identified that despite LPNs and CNAs accounting for 86% of SNF frontline staff, and their constant presence and involvement in the care of SNF residents, only five of the studies made any reference to the LPN being a part of the staff composition. Three studies made direct references to the CNA (Delgado et al., 2022).

Delgado et al. (2022) identified that descriptions of the LPN and CNA roles and their contributions to care are lacking in the literature related to identification of UTIs. Further review of the literature found that although CNAs are usually first to recognize changes in the resident, the RN is responsible for assessments and decision-making (Freeman-Jobson et al., 2016; Song Beeber et al., 2021). In the acute care setting where RNs are in ample supply, it might be feasible to have an RN assess every resident presenting with a change in condition that may be indicative of a UTI; however, the staffing composition of SNFs does not ensure RN availability

when a change occurs (Delgado et al., 2022; Harris-Kojetin, 2019). SNFs are only required to have an RN in the facility eight hours a day; this can include hours worked by the director, assistant director, or other administrative nurses (NC DHSR, Nurse staffing requirements, 2016).

Antibiotic stewardship is a part of SNF infection prevention that requires ongoing review of policies, procedures, and practices, as well as streamlining data collection, and providing feedback to guide practice (Agarwal et al., 2020; CMS, 2016). Antibiotic stewardship should be interdisciplinary (Agency for Healthcare Research and Quality [AHRQ], 2019; CDC, 2017; CMS, 2016), and led by an advanced practice provider, infectious disease specialist, or pharmacist (AHRQ, 2019; CDC, 2017). The goal of antibiotic stewardship is met by improving the diagnostic and prescriptive process through training and the use of evidence-based tools (CDC, 2021; Loeb et al., 2001; Stone et al., 2012). With HCPs providing care at multiple sites, antibiotic stewardship efforts in SNFs resulting from regulatory requirements are frequently led by the infection preventionist (RN) (Agarwal et al., 2020; CMS, 2016; Katz, 2009; Shield et al., 2014). Time constraints experienced by providers limit their ability to contribute to a time-intensive antibiotic stewardship process, placing a vast majority of the responsibilities on the nursing staff (Katz, 2009; Shield et al., 2014).

While there is evidence showing that increased RN staffing ratios are associated with decreases in positive urine culture results, the previously mentioned staffing composition at SNFs increases the likelihood that the nurse contacting the HCP to report changes in a resident that may be indicative of an infection is often an LPN (Gucwa et al., 2016; Harris-Kojetin et al., 2019; Mody et al., 2017; Rummukainen et al., 2012). The previously mentioned considerations may impact the application of antibiotic stewardship practices. When a change is noted in the SNF resident, there should be an exchange of information; this may include the CNA asking

questions and/or communicating with the nurse or resident (AHRQ, 2014). When a licensed nurse becomes aware of a change in a resident's condition, the nurse initiates appropriate action based on the nursing process (AHRQ, 2014). According to antibiotic stewardship recommendations, the nurse's decision should include the incorporation of evidence-based guidelines and tools (AHRQ, 2014, 2019). The data collected, using evidence-based guidelines, should then be communicated to the HCP (AHRQ, 2014). In this literature review, there was very little evidence of nursing staff decision-making or participation in the prescriptive process.

Multiple studies collected data from residents' charts (Agarwal et al., 2020; Bista & Champion, 2019; Norman et al., 2014), with some acknowledging the lack of documentation related to UTI signs and symptoms, resulting in unjustifiable initiation of antibiotics (Bista & Champion, 2019; Fleet et al., 2014; Norman et al., 2014). Studies that sought nursing perspectives, using either quantitative or mixed methods approaches, again focused on antibiotic stewardship practices that were modified for implementation in the SNF setting (Clifton et al., 2018; Krein et al., 2017; Mody et al., 2017; Pasay et al., 2019; Tark et al., 2020). Studies referencing the nurse generally referred to the nurse as a data collector, using the tools associated with evidence-based practice guidelines to supply the HCPs with information for prescriptive decision-making (Clifton et al., 2018; Freeman-Jobson et al., 2016).

Although previously mentioned studies acknowledged that nursing staff are key stakeholders in the implementation of interventions, the articles lacked evidence on the perspectives of the nursing staff related to recognition of UTIs and contributions to their decision-making process.

Knowledge Gap

Review of the literature revealed little information regarding how nursing staff determine a resident has a UTI and the experiences they have when determining UTI is present. A qualitative study, using Husserl's (2017) transcendental phenomenology as a framework, can address the existing gap in knowledge. Husserl posits that when studying phenomena, the use of epoché, eidetic reduction and intuiting will result in a description of the essence, or absolute, of the phenomena. This study provided the opportunity for these individuals to tell their stories and reflect on the events that take place in SNFs. Semi-structured, open-ended interview responses of SNF nursing staff were used to provide a thick description of their experience when encountering a resident whom they suspected were presenting with a UTI. Analysis of the data identified significant statements/themes related to nursing staff recognition of UTIs and common approaches to care.

CHAPTER 3: METHODOLOGY

Design

A description of the SNF nursing staff's lived experience and common practices will add to the existing knowledge base. The overarching research question for this study was: What is the lived experience of SNF nursing staff who suspect that a resident is experiencing changes which may be indicative of a UTI? To address the proposed research question, the most appropriate research design was an *a priori* phenomenological descriptive study using Husserl's (2017) transcendental phenomenological approach, incorporating epoché, eidetic reduction, and intuiting to uncover the essence of the experience.

Every member on this interdisciplinary research team has practical experience and expertise in the SNF setting, in a variety of roles, including nurse, nurse manager, nurse practitioner, infection preventionist, and antibiotic stewardship committee chairperson. Although the primary researcher in this study is a doctoral student, the remainder of the research team members are mentors with expansive knowledge and experience in the use qualitative, quantitative, and mixed methods approaches. To discover the answer to the research question, private interviews using open-ended questions were conducted with nursing staff. Private interviews and the use of open-ended questions promote more in-depth reflection and honesty on the part of the participant, thereby providing rich, detailed descriptions of the phenomena under study (Creswell & Poth, 2018; Polit & Beck, 2017; Risjord, 2010). The interview questions and further methodology details follow.

Setting and Sample

Due to the COVID-19 pandemic, SNFs were not permitting face-to-face access. Therefore, a snowballing technique and social media recruitment were used to obtain a purposive semi-stratified sample of SNF nursing staff in eastern North Carolina. In relation to the snowballing technique, appropriate personnel (SNF RNs, LPNs, CNAs) already known to the primary researcher were contacted, informed of the study purpose/inclusion criteria, and asked to refer participants by giving the researcher's contact information to the potential/unknown participant to reach out for further information/screening. A recruitment flyer was also available and distributed during snowballing (Appendix B). A potential participant had the option of giving the referring person permission to provide their contact information (phone number or email) to the primary researcher to initiate contact. Individuals interested in participating were pre-screened; those self-reporting that they met inclusion criteria were scheduled for an interview. Contact information was destroyed at the conclusion of the interview process for participants who declined to review their transcript. For participants requesting to review their transcripts, contact information was destroyed after deidentified transcripts were emailed to them.

Sole use of the snowballing technique was less effective than expected. With the COVID-19 pandemic limiting face-to-face social interaction, social media use had been heightened. To reach a wider range of individuals, Facebook® was used to disseminate an ECU branded and University Medical Center/Institutional Review Board (UMCIRB) approved recruitment post (Appendix C). Facebook is a social media platform used by billions of individuals and organizations, including those working in the field of nursing (Kosinski et al., 2015). Facebook contains a variety of public and private professional nursing-related groups.

The primary researcher contacted group administrators via Facebook messenger or email to obtain permission to share the recruitment post and associated information on the groups' timelines. When requesting permission, the group administrators were provided the description of the study provided to potential participants during the recruitment screening as well as the recruitment post. Group administrators were asked to share the recruitment post and/or allow the primary researcher to share the post within the group. They all opted to allow the primary researcher to share the post within the group. Individuals known to the researchers were also asked to share the recruitment post on their personal and/or professional social media page(s) and ask others to share. Any individuals requesting further information were asked to contact the primary researcher using the methods outlined within the recruitment post to maintain confidentiality. No study data or personal information pertaining to participants were shared via Facebook posts.

Eligible participants were aged 18 or older, educated/trained and certified/licensed as a CNA, LPN, or RN, self-reported at least 12 months of part-time or full-time SNF employment in the last 4 years and able to communicate in English. Contract or per diem staff qualified if they worked in the SNF for the equivalent of at least part-time hours and met all other inclusion criteria. Because current SNF antibiotic stewardship guidelines became effective in November 2017, the employment range included in this study was restricted to the last 4 years.

Individuals were excluded if they did not meet the inclusion criteria or if they were previously supervised by the interviewing researchers. LPNs and RNs were excluded if they were employed by the SNF in nursing management or administrative roles because they typically do not have daily, intense interactions with residents. Semi-stratified purposive sampling was

used to ensure that licensed nurses were represented in the sample and/or all available RNs meeting inclusion criteria were recruited.

A target sample size of 10-15 participants was estimated based on prior phenomenological studies. Interview location was determined by the participant. To ease fear related to in-person contact and increasing rates of COVID-19, potential participants were provided the option of interviewing via Web-Ex. Interviews were not to exceed 60 minutes and participants received a \$25 gift card as compensation for their time. Participants interviewing via WebEx received a \$25 gift card electronically via email. All participants being compensated for their time were asked to provide an email address, which was discarded once the payment was logged in ECU's Greenphire system.

Data Collection

Following UMCIRB approval, the primary researcher (graduate student) and research mentor (dissertation chair) were provided with a journal for epoché. The primary researcher also obtained a notebook for documentation of additional study related notes. Prior to the first interview, epoché was used to document any personal and/or professional thoughts, experiences, or other information related to the research topic in their journal. Prior to the start of each interview, researchers were present 30 minutes in advance. This time was used to set up and privately journal any personal and/or professional thoughts, experiences, or other information that related to the research topic or interviewing SNF staff members. To further reduce introduction of personal bias, following each interview the researchers journaled a self-reflection on thoughts about the interview and considered if or how personal beliefs, feelings or thoughts influenced the interview.

Individual, open-ended, semi-structured interviews were used to promote in-depth participant reflection and honesty (Creswell & Poth, 2018; Polit & Beck, 2017). Interviews were scheduled by the primary researcher who also obtained informed consent. Participants interviewed via WebEx were asked to provide verbal consent. A blank copy of the consent form was emailed to participants for their own recordkeeping. Gift card were emailed to participants at the close of the virtual interview. Demographic data (Appendix D) was collected prior to the initiation of interview questions. For consistency, only the primary researcher asked interview questions (Appendix E). Since the primary researcher was a doctoral student, the research mentor was responsible for observing and providing feedback on the primary researcher's interview techniques and processes. Recordings were obtained using the WebEx application, accessed using the researchers' ECU secure login. During in-person interviews, WebEx was used to perform voice recording but video recording was disabled. Following WebEx interviews, video recordings were deleted following validation of transcription. At the close of the interview, participants were asked if they would like to review the verbatim transcript of their interview, once available. If they agreed, they were asked to provide an email address for sharing of the transcript. Participants were asked to provide feedback via email to the primary researcher within three days or request an extension. If no feedback was received, no extension requested, or no response from the participant was received within seven days of the interview date, the researcher considered this as acceptance of the transcript as is, and member checking complete. The use of member checking provides validation of the transcript contents and increase credibility (Creswell & Poth, 2018).

The WebEx application generated a transcript of the interviews using automatic voice recognition software. In case technical difficulties occurred, a digital recording device was used

as back-up. Following the interviews, the recordings were uploaded to a uniquely assigned secure server, ECU Pirate Drive. Consent forms and demographic data were transported by the primary researcher to the ECU College of Nursing (CON), where they have been stored by the faculty research mentor in a locked cabinet, within a locked private office. The primary researcher reviewed the WebEx generated transcript drafts and recordings. Necessary edits were made to the transcripts to ensure accuracy. The faculty mentor validated accuracy of transcription.

To answer the research question, the interview guide consisted of open-ended questions (Appendix E), with additional probing questions to elicit more in-depth responses. The initial question was intentionally broad and structured as a story telling prompt to establish rapport between interviewer and participant. Additional questions were added based on responses by the participant that required clarification or further exploration.

Data Analysis

Data analysis consisted of review of the interview transcripts, notes, and researcher journals. During the review of these documents, the researchers used epoché and intuiting, as described in the framework and data collection sections, to contribute to eidetic reduction of the data. To establish trustworthiness and credibility two research team members analyzed each interview transcript and reached consensus regarding significant statements. Data reduction consisted of repeated line-by-line reading, highlighting significant terms or phrases, and writing memos in the margins of the transcript. Following the reduction of each transcript and identification of the underlying essence, the researchers compared the findings between participants to determine if there were similarities, much like with the use of constant comparative analysis in grounded theory (Creswell & Poth, 2018). Following independent

reduction, team members convened to discuss epoché and create/revise a codebook of significant themes (Creswell & Poth, 2018). If consensus could not be reached between the researchers, additional members of the research team were prepared to participate in the analysis of said transcript until consensus could be reached.

CHAPTER 4: NURSING STAFF'S ROLE IN DETECTING URINARY TRACT INFECTION IN NURSING HOMES: AN INTEGRATIVE REVIEW

Abstract

Despite evidence-based protocols, inappropriate antibiotic use still presents a systemic global threat to healthcare in nursing homes (NHs). Nursing staff are responsible for recognizing signs and symptoms that may indicate urinary tract infections (UTIs). This integrative review was designed to examine the state of the literature related to the role of nursing staff in UTI identification and care in NHs. The review, including 19 articles published between 2011 and 2020, identified that although a prescriber was an expert in UTI management, the nursing staff in NHs were the individuals who recognized changes and communicated the residents' needs to the prescribers. Further research is required to understand nursing staff's decision-making and unique perspectives and determine if evidence-based protocols align with current practice in the NH setting.

Keywords: nurse, nursing, licensed practical nurse, licensed vocational nurse, detection, urinary tract infection, long-term care, nursing home

Introduction

In the United States (U.S.), the 65 and older population is expected to increase by almost 50% by 2030 (Medina et al., 2020). UTIs' diagnostic accuracy present a significant challenge in this population (McElligott et al., 2017). Older adults are more likely to require care in nursing home (NH) settings, and currently, there are 1,347,600 NH residents in the U.S. (Harris-Kojetin et al., 2019).

Every year, 50-70% of NH residents are administered at least one antibiotic (CDC, 2017). More importantly, of the antibiotics prescribed, 75% were prescribed inappropriately, and 50% were the wrong drug, dose, or duration (CDC, 2017). Inappropriate antibiotic use constitutes unnecessary medication use, which is now identified and investigated during NH state surveys because of the *Final Rule* (Centers for Medicare and Medicaid Services [CMS], 2016). Under the *Final Rule*, facilities can be cited and fined with failure to improve practices related to antibiotic use and infection prevention (CMS, 2016). According to the World Health Organization (WHO, 2014), antibiotic resistance resulting from inappropriate antibiotic use has become a systemic global threat to health. The CDC (2020) emphasizes that this health crisis impacts NHs substantially because of the communal living arrangements, comorbidities, and increased susceptibility.

Urinary tract infections (UTIs) are one of the most common diagnoses and indications for antibiotic use in NH residents (Harris-Kojetin et al., 2019). Constraints related to alterations in residents' communication, functional and mental impairment may result in inappropriate antibiotic prescribing (Loeb et al., 2001; Thompson et al., 2020). Among the antibiotics prescribed inappropriately in NHs every year, one-third are prescribed for UTIs (Centers for Disease Control and Prevention [CDC], 2017). Research indicates that as many as 50% of

women and 40% of men in NHs may experience asymptomatic bacteriuria, the presence of bacteria in the urinary tract in the absence of infection, resulting in the overuse of antibiotics (Ashraf et al., 2020). Despite recommended NH consensus guidelines, asymptomatic bacteriuria continues to be treated with antibiotics (Ashraf et al., 2020).

Inappropriate antibiotic use is defined as administering an antibiotic without meeting recommended guidelines (Loeb et al., 2001; Stone et al., 2012; van Buul et al., 2018). Empirical prescribing refers to ordering antibiotics in the absence of clinical signs and symptoms, the treatment of asymptomatic bacteriuria and/or ineffective administration of an antibiotic (CDC, 2017; van Buul et al., 2018). Inappropriate antibiotic use frequently results in adverse events, such as antibiotic resistance, drug-to-drug interactions, increased opportunities for medication errors, increased healthcare costs, *Clostridioides difficile* infections, and death (Ashraf et al., 2020; CDC, 2017). In NHs, nursing staff spend a significant amount of time with the residents and are usually the first to recognize a change in condition. The purpose of this integrative review was to examine the state of the science to determine NH nursing staff's impact on the prescriptive process related to the identification and report of signs and symptoms indicative of UTI.

Problem Identification

The prescriptive decision-making process for UTI includes recognizing signs and symptoms, evaluating the need for urine specimen collection and testing, determining the need for antibiotic therapy, selecting an antibiotic, and following up to assess effectiveness (Agency for Healthcare Research and Quality [AHRQ], 2019). According to criteria set by Loeb et al. (2001) and Stone et al. (2012), signs and symptoms of a UTI include fever, dysuria, suprapubic pain, sudden changes in urinary frequency, urgency, or incontinence, or several other symptoms,

in combination with a positive urine culture. In the U. S, prescribers are often off-site from the NH when making prescriptive decisions (Rummukainen et al., 2012), and these decisions are based on nursing staff observations. In NHs, nursing staff may include the registered nurses (RNs), licensed practical nurses (LPNs), also referred to as licensed vocational nurses (LVNs), and certified nursing assistants (CNAs). NHs are required to have an RN on-site for 8 hours per day and available by phone the remainder of the day (North Carolina Division of Health Service Regulation, Nurse staffing requirements, 2016). As a result, LPNs and CNAs, who comprise 86% of NH staff, are typically the ones communicating with prescribers (Harris-Kojetin et al., 2019). With the licensed nurse being on-site, having access to resident charts, evaluating the situation, and then communicating with the prescriber, it can be expected that the findings from their evaluation would directly impact the prescriptive process.

Methods

Design

With SNF nursing staff observations impacting the prescriptive process, it is of utmost importance that their contributions to care and decision-making processes be better understood. This integrative review was conducted following Whittemore and Knafl's (2005) recommended methodology: problem identification, literature search, data evaluation, data analysis, and presentation. We used an *a priori* process to analyze non-experimental and experimental data and enhance rigor while reducing bias (Whittemore & Knafl, 2005).

Literature Search

Databases searched included PubMed, Scopus, CINAHL, and ProQuest. A university librarian (XX) assisted with the development of the search strategy. An initial set of key terms included 'licensed practical nurse,' 'detect,' 'urinary tract infection,' and 'long-term care.' A

more extensive list of search terms was created to obtain relevant data, including the broader variations of the above terms, such as ‘nursing homes,’ ‘skilled nursing facilities,’ ‘assisted living facilities,’ ‘bladder infection,’ and ‘kidney infection.’ With LPNs being the primary point of contact for prescribers, the search terms focused on their nursing title. The complete search strategies were made available on the XX University repository, XX, and can be viewed at the following link: XX. The research team agreed that these search terms were representative of the concepts under review: nurse, role, nursing home, and urinary tract infection.

Search Process. The articles included empirical data-based studies or systematic reviews published in English, focused on detecting and reporting residents’ UTIs, and referenced nurses, nursing staff, or frontline staff. The search included studies published between 2010 and 2020. The title and abstract review excluded the articles that only included non-SNF settings, infections other than UTI, and/or focused solely on advanced practice providers. For articles without abstracts, we reviewed the full text and eliminated those not in the NH setting. One article could not be located by title alone, and the author’s information was not provided. One article had to be obtained via direct request from the author and was not available prior to the analysis. Records not available in the English language were excluded. Full-text reviews were performed on all remaining articles. Articles were excluded if they were reviews of individual studies, consensus/clinical practice guidelines, or case studies. The process of inclusion and elimination was displayed in the PRISMA diagram (Figure 1).

Data Evaluation

The level of evidence and quality were analyzed, by XX and XX, using Johns Hopkin’s nursing evidence-based practice guidelines. This tool can be used to evaluate experimental, nonexperimental, and quasi-experimental studies, systematic reviews, expert opinion, and

experiential evidence (Dearholt & Dang, 2012). The Johns Hopkins' tool appraises quality based on level of evidence: Level I evidence- randomized control trials (RCTs) and systematic reviews of RCTs; Level II evidence- Quasi-experimental studies and systematic reviews containing a combination of RCTs and quasi-experimental studies or only quasi-experimental studies; Level III evidence- Qualitative studies, non-experimental studies and systematic reviews including non-experimental studies; Level IV evidence- Clinical practice guidelines and consensus based on expert opinion and scientific evidence; Level V evidence- Literature reviews, quality improvement projects, case reports, and expert opinion based on experiential evidence. After the level of evidence was identified, the quality of each article was determined based on the consistency and generalizability of results and recommendations, the sample size for the study design, definitiveness of conclusions, aims and objectives, and thoroughness of supporting literature, in addition to other factors (Dearholt & Dang, 2012). XX and XX convened to address any discrepancies. The results of the evaluation have been presented in Table 1.

Data Analysis

In alignment with Whitemore & Knafl's (2005) recommendations, a constant comparative method was used in conjunction with Matrix Method (Garrard, 2017) to extract data from the included articles and identify overarching themes. Whitemore and Knafl (2005) defined the constant comparative method as an analytical approach used to systematically convert extracted data into categories, themes, etc., based on identified commonalities. The Matrix Method is a thorough, methodological approach to data analysis, suitable for researchers of all experiential levels (Garrard, 2017). The data extracted included authors' names, studies' geographical location, purpose/aim(s), study design, setting, sample, measures used, statistical

analysis, and major findings on nurse/nursing staff's role in UTI detection and reporting. Overarching themes are discussed in the presentation section of this review and displayed in Table 2, along with some of the extracted data.

Demographics of the Studies Reviewed. After removing duplicates and applying screening methods, 19 articles remained for analysis and consisted of 16 quantitative studies, one mixed methods study, one qualitative study, and one systematic review.

The systematic review included findings in various countries, including the U.S., China, and The Netherlands. Ten of the 16 quantitative studies, the mixed methods study, and the qualitative study were performed in the U.S. (Table 2). Despite variations in healthcare education between the U.S. and other countries, literature from non-U.S. countries was not excluded, as there were some similarities noted in the structure of NHs and communication between the nurse and prescriber.

Presentation

In reference to nursing staff, we identified three major themes: elements of antibiotic stewardship in NHs, nursing's influence on prescriptive decision-making, and nursing staff's antibiotic stewardship responsibilities.

Elements of Antibiotic Stewardship in NHs

Antibiotic stewardship practices included policies and recommendations guiding the use of antibiotics, data collection, review of the appropriateness of antibiotic use, provision of feedback to antibiotic prescribers, and the integration of infection preventionists into NH settings (Agarwal et al., 2020; Meddings et al., 2017). Evidence-based practice and associated tools have been reported to empower nurses to advocate for patients and facilitate more effective communication with prescribers (Cooper et al., 2019; Fleet et al., 2014; Krein et al., 2017).

Evidence-based practices related to indwelling catheters and infection prevention have been shown to improve the outcomes related to urinary tract infections (Estabrooks et al., 2016; Meddings et al., 2017). The antibiotic stewardship practice of providing feedback had been beneficial to prescribers but was just as impactful when provided to nursing staff and had positive outcomes for their associated organizations (Estabrooks et al., 2016). One study also found that professional RN training did not affect infection control practices, while specialized training of the infection preventionist strongly impacted infection control practices (Agarwal et al., 2020). Despite various elements of evidence-based antibiotic stewardship practices for SNF prescribers and nursing staff being recommended and implemented in NHs, as a direct result of CMS (2016) regulations, antibiotic prescribing in NHs continued to result in suboptimal outcomes (Cooper et al., 2019; Krein et al., 2017).

Various antibiotic stewardship tools and interventions have been proven successful in the acute care setting (Clifton et al., 2018). However, the NH setting presents challenges for the implementation and success of antibiotic stewardship practices, which are unique to this setting, and must be tailored to address the limitations of the setting and the residents (Bista & Champion, 2019; Clifton et al., 2018; Krein et al., 2017; Lemoine et al., 2018; Szabo & Böröcz, 2014). One study found that licensed and unlicensed healthcare personnel shared common knowledge gaps concerning antibiotic stewardship practices (Trautner et al., 2017). Other studies found that NHs run by the Veteran's Administration (VA) were noted to devote more time to infection control programs and have higher RN staffing ratios than non-VA NHs (Krein et al., 2018; Mody et al., 2017). Higher RN staffing ratios were reported to be associated with increased UTI surveillance tracking and fewer positive urine cultures (Gucwa et al., 2016; Mody

et al., 2017). Based on the data presented, nursing staff were key stakeholders in the implementation of antibiotic stewardship practices in SNF.

Nursing's Influence on Prescriptive Decision-making

Two studies stated that the prescriber, often identified as the physician or nurse practitioner, was the expert with the knowledge and authority to identify UTIs in the NH setting (Bista & Champion, 2019; Norman et al., 2014). However, prescribers typically are off-site, and the nurse is the primary contact (Fleet et al., 2014; Pettersson et al., 2011; Tark et al., 2020). Prescribers usually based their prescriptive decisions on information provided by the nurse (Cooper et al., 2019; Fleet et al., 2014; Norman et al., 2014; Pettersson et al., 2011; Tark et al., 2020). The nurse collaborated with and received information from the CNA, as the CNAs spent more time with residents and were the first to notice subtle changes (Freeman-Jobson et al., 2016). One study noted that most of the systemic antibiotics were prescribed during general practitioner visits to the facility and that the data collection tools were completed by the nurses (Fleet et al., 2014). It was unclear if prescriptive decisions were based on the nurses' data collection, prescriber data collection, or a combination of the two.

While prescribing is beyond the scope of NH nursing staff, nurses in some NHs had the authority to perform urine dipsticks for urinalysis before contacting the physician when they noticed a change that they deemed indicative of a UTI (Cooper et al., 2019). It is unclear whether the decision to perform urine dipsticks was based on antibiotic stewardship, facility guidelines, or nursing staff knowledge and/or experience. Nursing staff and provider knowledge gaps in differentiating asymptomatic bacteriuria from UTI increased unnecessary treatment (Lemoine et al., 2018; Pettersson et al., 2011; Trautner et al., 2017). While educational interventions and decision-making tools were shown to be effective in decreasing inappropriate

use of antibiotics, sustainability of these approaches presented a challenge if nursing staff were not properly educated, empowered, and willing to take ownership of the intervention (Cooper et al., 2019; Krein et al., 2017).

Nursing Staff's Antibiotic Stewardship Responsibilities

NH nurses were identified as essential due to their daily presence and constant interactions with the residents (Pettersson et al., 2011). Nurse staffing ratios have been shown to impact rates of UTIs and multi-drug resistant organisms in NHs, with higher RN staffing rates being associated with lower rates of poor outcomes (Gucwa et al., 2016; Mody et al., 2017). Nurses were key stakeholders and responsible for identifying and monitoring resident infections (Cooper et al., 2019; Pasay et al., 2019). Multiple studies referred to the nurse as the data collector for prescribers, with the information obtained from the nurse's evaluations being used to make care decisions (Cooper et al., 2019; Fleet et al., 2014; Norman et al., 2014; Pettersson et al., 2011). Despite having more LPNs on staff in NHs, and many prescriptive decisions being dependent on information reported from their report, only five of the studies made any reference to the role of the LPN (Agarwal et al., 2020; Freeman-Jobson et al., 2016; Guca et al., 2016; Mody et al., 2017; Trautner et al., 2017).

One study noted that CNAs' use of best practices occurred more frequently when evidence was presented clearly and concisely in a manner that was tailored to the recipients (Estabrooks et al., 2016). CNAs had a significant impact on the prevention and identification of infection as they could recognize early signs while providing daily care (Freeman-Jobson et al., 2016). They also communicate their observations to nurses (Trautner et al., 2017). Four of these studies failed to explicitly address the role of the nurse or nursing staff, referring to NH staff only as long-term care staff, frontline staff, and/or facility representatives (Clifton et al., 2018; Krein

et al., 2018; Meddings et al., 2017; Szabo & Böröcz, 2014). None of the studies referred to factors that affect nursing staff's decision-making related to changes indicative of UTIs.

Discussion

This integrative review was performed to examine the state of the literature related to nursing staff and their impact on the detection/identification of UTIs in NH residents. Three common themes were identified using constant comparative analysis: elements of antibiotic stewardship in NHs, nursing's influence on prescriptive decision-making, and nursing staff's antibiotic stewardship responsibilities. Implementation of evidence-based practices, also referred to as antibiotic stewardship, required an interdisciplinary approach in the NH setting, including the prescriber, nursing staff, and an expert in infectious disease or pharmaceuticals (AHRQ, 2019; CDC, 2017; CMS, 2016). Such collaboration has been shown to improve antibiotic stewardship (Nace et al., 2020).

Physicians or nurse practitioners have prescriptive authority related to treating infections in NHs; however, limited on-site presence and increasing advanced provider-to-resident ratios create barriers to their ability to prescribe effectively without nursing support (Thompson et al., 2020; Rummukainen et al., 2012). Although most of the literature presented in this integrative review acknowledged that nursing staff play an essential role in the decision-making process, the literature failed to describe factors associated with nursing staff's decision-making related to the detection of UTIs. The pervasiveness of UTIs and concentrated nursing care in NHs make it imperative to understand decision-making (Ashraf et al., 2020; Nace et al., 2020). The studies in this review did not discuss the nurses' cognitive and clinical judgment processes, thereby giving the impression that the contribution of nurses in the prescriptive process is undervalued.

Since nursing staff are continuously at the bedside, they are more likely to notice subtle changes in a resident's condition, and these changes may indicate infection or other conditions (Scales et al., 2017). This review showed some degree of independent decision-making promoting communication between nurses and CNAs as critical. There was some degree of independence for the nurse who made determinations regarding the resident data reported to a prescriber (Fleming et al., 2015). Although decision-making processes imply autonomy, autonomous evaluation is within the RN's scope of practice, and not within the LPN's educational preparation nor their scope of practice in most of the U.S. and is not in the CNA's scope of practice; however, these two roles account for the majority of staff composition in NHs (Harris-Kojetin et al., 2019).

Most studies acknowledged the nurse in some capacity, but none were focused on factors associated with the nurse's detection of UTIs. In addition, the LPN was rarely addressed in the literature. The lack of representation of the nurse's decision-making process in UTI detection and care presents a stark gap in the literature. In the absence of prescribers, nursing staff are responsible for determining changes indicative of UTI (Fleming et al., 2015; Scales et al., 2017). LPNs are the most common point of contact for prescribers, so it is imperative that their rationale for suspecting UTI in NH residents be analyzed. Additionally, RN decision-making in the SNF setting requires further study. Two of the studies identified CNAs' influence on the prescriptive decision-making process, despite their constant presence at the bedside, consistent with Fleming et al. (2015).

It is essential to determine the factors considered by the nursing staff when deciding to contact a prescriber regarding changes in the health status of the LTC resident. Nurses may consider information gleaned from CNAs, residents' families, or their own findings (Scales et

al., 2017). Furthermore, the decision to contact the prescriber may be based upon various influential factors, including the nurse's education, personal experiences, clinical judgment, work experience, interactions with families, or others that have yet to be identified (Fleming et al., 2015). The complexity of decision-making surrounding infection treatment is only partially understood following this review.

Implications

Further research must clarify the nursing staff's role(s) in detecting UTIs and their decision-making before reporting changes to the prescriber. Future findings may identify pivotal information and influential factors leading to the development of nursing-led interdisciplinary collaborative interventions that improve appropriate antibiotic use. Furthermore, when, and how nurses utilize protocols needs to be examined. Using this study as a foundation, future studies which include LPNs and CNAs may have a notable impact on SNF regulations, education, and nursing scope and standards of practice.

Limitations

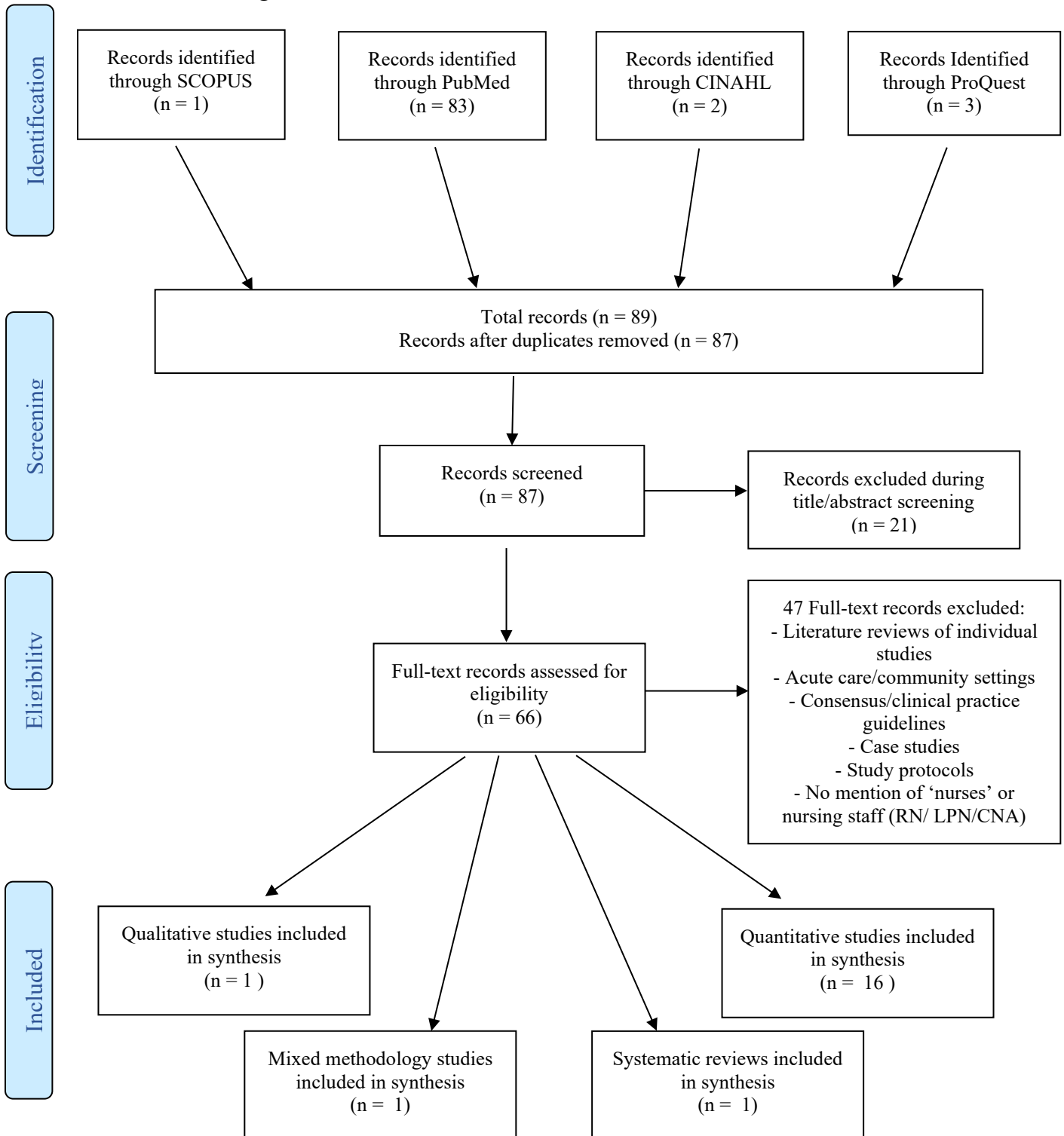
This integrative review was a preliminary review of existing literature related to nursing's role in antibiotic stewardship and prescriptive decision-making. The pre-determined inclusion and exclusion criteria may have excluded some records that might have added to the review's findings during the literature search. For example, the inclusion of the LPN in the search terms may have excluded additional data on RNs and CNAs. A limitation associated with using the constant comparative method is that as a qualitative process, other researchers may read the same articles and have varying views on the quality and analysis of the literature.

Conclusion

This integrative review found that prescribers, either physicians or nurse practitioners, were the experts responsible for identifying and diagnosing UTIs. However, even though they have prescriptive authority, prescribers often make diagnostic and prescriptive decisions dependent on the nursing staff's observations and communication. The nursing staff is likely to be an LPN, who may receive their information from a CNA. This review provides the foundation for further research related to nursing staff's role in detecting UTIs in NH residents and the factors that may influence their decision-making.

Figure 1

PRISMA Flow Diagram



Note: adapted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement. I(7): e1000097. doi:10.1371/journal.pmed1000097.

Table 1

Level of Evidence and Quality of the Literature

First Author, Year	Evidence Level	Quality Ranking
Pasay, 2019	I	High
Pettersson, 2011	I	Good
Fleet, 2014	I	Low
Meddings, 2017	II	High
Agarwal, 2020	III	High
Krein, 2017	III	High
Mody, 2017	III	High
Trautner, 2017	III	High
Estabrooks, 2016	III	Good
Krein, 2018	III	Good
Lemoine, 2018	III	Good
Szabo, 2014	III	Good
Tark, 2020	III	Good
Bista, 2019	III	Low
Gucwa, 2016	III	Low
Norman, 2014	III	Low
Clifton, 2018	V	High
Freeman-Jobson, 2016	V	High
Cooper, 2019	V	Good

Note: Level of Evidence and Quality ranking of literature analysis based on Johns Hopkin's nursing and evidence-based practice guidelines. Dearholt, S. L., & Dang, D. (2012). *Johns Hopkins nursing evidence-based practice: Model and guidelines* (2nd ed.). Sigma Theta Tau International. Level of evidence is ranked from I to V, with Level I referring to randomized control trials (RCTs) and systematic reviews of RCTs and Level V being literature reviews, quality improvement projects, case reports and expert opinion based on experiential evidence. Quality appraisal is ranked from low to high, with criteria dependent on the level of evidence.

Table 2

Literature Review Matrix

First Author, Year, Country	Study design, Setting/Sample	Findings	Themes Identified
Agarwal, 2020, United States (U. S.)	Retrospective comparative analysis. 945 nursing homes (NH) in 2014; 888 NH in 2018	<ul style="list-style-type: none"> • From 2014 to 2018, higher rates of RN staffing hours, increase in prevalence of antibiotic stewardship practices/policies (31.8% to 65.3%). • Time and specialized infection control training had strong effect on practices, while professional RN training and staff turnover had no effect. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing staff's antibiotic stewardship responsibilities
Bista, 2019, U. S.	Retrospective chart review. 63 resident's charts in 3 LTC facilities	<ul style="list-style-type: none"> • Primary reason for clinicians suspecting UTI was change in behavior, followed by change in urine characteristics; only 7.9% had fever. • Of 60 urine cultures, 29 had colony counts >100,000 CFU/mL but 40 received antibiotics. • Twenty-two initiated treatment before culture results received. • Eleven of the initially prescribed antibiotics had negative cultures and antibiotics were not discontinued. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making
Clifton, 2019, U. S.	Quality improvement program evaluation. 134 Veteran's Administration (VA) community living centers across the country	<ul style="list-style-type: none"> • Reduction of CAUTI rates by 51.2% from 2010 to 2016. • Urinary catheter device use did not show a reduction from 2010 to 2016. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing staff's antibiotic stewardship responsibilities
Cooper, 2019, Midwest, U. S.	Mixed methods. All long-stay residents within a 120-bed facility; knowledge test-49 nurses and 4 providers	<ul style="list-style-type: none"> • Nurses self-reported improved knowledge and understanding of asymptomatic bacteriuria, UTI and inappropriate antibiotic use • Eighteen inappropriate antibiotic treatments preintervention and 1 postintervention. • Algorithm adherence 100%. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic

		<ul style="list-style-type: none"> • Knowledge assessment results- 47% pre-education, 82% post-education, 79% post-project. 	stewardship responsibilities
Estabrooks, 2016, Western Canada	Longitudinal cross-sectional. 1831 healthcare aides in 30 urban NH	<ul style="list-style-type: none"> • NH with low rates of UTIs and indwelling catheter use are higher in organizational context and lower organizational context had higher rates of UTIs. • Care aides on a unit with more favorable organizational context reported higher research utilization when delivering resident care. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Fleet, 2014, London	Prospective cluster randomized control. 30 NH; 1628 residents pre-intervention and 1610 post-intervention	<ul style="list-style-type: none"> • Eighty-six percent of systemic antibiotics were prescribed by primary care practitioners (GP) mainly during GP visits to facility. • 'Few' prescriptions based on microbiology lab results and only 9.4% (pre) and 11.1% (post) of residents in the intervention group met McGeer's criteria and 7.8% & 2.6% in control group, respectively. • Use of RAMP resulted in increase of prescriptions that fully met Loeb's criteria (from 11.5% to 19.3%). • RAMPS completed by nurses. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Freeman-Jobson, 2016, U. S.	Quality improvement project. 3 LTC homes; 42 LTC staff (NH, SNF, AL)	<ul style="list-style-type: none"> • Knowledge scores improved significantly pre to post-evaluation. • Significant improvement in knowledge related to how UTIs are diagnosed. 	<ul style="list-style-type: none"> • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Gucwa, 2016, Long Island, New York (U. S.)	Correlational retrospective. 12 SNFs; 1523 urine cultures (clean catch, straight Cath, suprapubic aspiration, indwelling catheter)	<ul style="list-style-type: none"> • 1142 (75%) had positive urine cultures; 164 (14.4%) caused by multi-drug resistant organisms (MDRO). • 184 samples considered contaminated (>3 organisms). • Likelihood of positive urine culture 76% lower for every additional star increase in overall rating and 35% lower for every star increase for RN staffing rating. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing staff's antibiotic stewardship responsibilities

		<ul style="list-style-type: none"> • Likelihood of MDRO increased by factor of 3.18 for facilities with higher number of catheters and decreased 97% for each star increase for RN staffing • Consumers should focus on overall star ratings and competency of nursing staff rather than individual quality measures. 	
Krein, 2018, U. S.	Longitudinal between groups comparison. 63 VA NH	<ul style="list-style-type: none"> • No change in CAUTI rates, catheter use or urine culture orders possibly related to relatively low baseline CAUTI rates. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Krein, 2017, U. S.	Qualitative. NH: 8 organizational leads and 8 facility leads	<ul style="list-style-type: none"> • Organizational and facility leads indicated that the AHRQ program resulted in greater staff empowerment, increased knowledge, increased awareness of CAUTI prevention. • Staff more comfortable asking physicians about need for indwelling catheters/antibiotics and urine cultures. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Lemoine, 2018, Hauts-de-France region	Prospective observational. 134 NH; 444 UTI episodes	<ul style="list-style-type: none"> • Most reported diagnostic criteria: burning urination (32%) and malodorous urine (29%); 43% had urine dipstick, 94% had urine culture • Most common supposed diagnoses: uncomplicated cystitis (32%), UTI without specific details (26%) and diagnosis not mentioned (25%). • Adequacy- treatment active in 345 cases (84.8%); treatment duration exceeded 10 days in 22% of cases. • Treatment reevaluation was reported in 277 cases. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making

		<ul style="list-style-type: none"> • Antibiotic switch following reevaluation in 23 cases. • De-escalation therapy was possible for 157 patients and only done for 2. • No reevaluation was reported for 166 patients. • After reclassification, 44 cases were consistent with 2014 guidelines. • Duration of therapy complied with guidelines in 19% of supposed diagnoses. 	
Meddings, 2017, International	Systematic review of randomized controls and quasi-experimental. 20 records containing 19 interventions	<ul style="list-style-type: none"> • Only one study presented an intervention with statistically significant reduction in CAUTI rates; this included hand hygiene, preemptive precautions, promotion of standardized CAUTI definitions and MDRO surveillance. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs •
Mody, 2017, U. S.	Quantitative descriptive. 41 VA and 306 non-VA NH from 41 states; Six staff nurses participated	<ul style="list-style-type: none"> • VA NH had higher ratios of RN staffing to beds than non-VA (30.4 vs 13.6 per 100 beds). • Higher percentage of VA NHs reported having 24-hour RN supervision than non-VA (96% vs. 56%). • Eighty-five percent of VA NHs had infection preventionist with ≥ 3 years relevant experience. • VA NHs had lower percentages with indwelling urinary catheter policies and homes reporting the need to have a physician's order for insertion of catheter but higher percentage using bladder scanners regularly and pre-connected urinary catheter drainage systems. • Higher percentages of VA NHs reported tracking CAUTI and sharing results with nursing personnel. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities
Norman, 2014, Southern U. S.	Retrospective review. 2 rural NH	<ul style="list-style-type: none"> • NH 1: <ul style="list-style-type: none"> ○ Eighty-five cases of UTI in previous 12 months ○ Five had no documentation of UTI symptoms/no urinalysis/no antibiotics ordered ○ Three cases met diagnostic criteria 	<ul style="list-style-type: none"> • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities

		<ul style="list-style-type: none"> ○ Seventy-seven cases had single species bacterial growth with 10² colony count ○ All received antibiotic therapy. ● NH 2: <ul style="list-style-type: none"> ○ Ninety cases of UTI in previous 12 months ○ One case reported as UTI when it was URI, ○ One case met diagnostic criteria ○ Eighty-eight cases received antibiotics ○ Forty-five cases had single species bacterial growth with 10² colony count ○ Fifteen cases had no bacterial growth. 	
Pasay, 2019, Alberta Canada	Cluster randomized control. 62 NH (21 in intervention group)	<ul style="list-style-type: none"> ● Control groups had lower baseline rate of urine cultures per 1,000 resident days. ● Intervention group had statistically significant decrease in urine cultures per resident days post-intervention. ● UTI antimicrobial prescriptions per 1,000 resident days decreased in intervention group post-intervention. ● Outcome rates, over time, trended back toward baseline data indicating need for continual efforts to sustain change. 	<ul style="list-style-type: none"> ● Nursing's influence on prescriptive decision-making ● Nursing staff's antibiotic stewardship responsibilities
Pettersson, 2011, Sweden	Cluster randomized control. 46 NH; 2511 residents	<ul style="list-style-type: none"> ● 702 infectious episodes pre-intervention and 540 post-intervention ● Number of UTIs per resident decreased significantly within groups but not between groups; ● Number of infections treated with an antibiotic in the intervention group decreased significantly in comparison to the control group. ● Proportion of physician's "wait and see" instructions increased significantly in the intervention group, compared to the control group. ● No increase in adverse events for following recommendations of intervention). 	<ul style="list-style-type: none"> ● Nursing's influence on prescriptive decision-making ● Nursing staff's antibiotic stewardship responsibilities

Szabo, 2014, Hungary	Point prevalence. 91 LTC facilities with 11,823 eligible residents	<ul style="list-style-type: none"> • 156 residents received one or more antimicrobial agents, most frequently for UTI (40.3%). • Two positive microbiology results were reported for UTI. • Elements of antibiotic stewardship programs/policies available in 82 LTC facilities (90.2%). 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing staff's antibiotic stewardship responsibilities
Tark, 2020, U. S.	Cross sectional survey. 892 NH across the country	<ul style="list-style-type: none"> • Infection management preferences more likely to be elicited following change in condition (55-60%) versus on admission or during care plan meeting; • Overall, 52.8% of NH gave antibiotics near end-of-life. • If UTI suspected at end-of-life, straight Cath used to collect urine sample and antibiotics ordered two-thirds of the time. • Comfort measures/no antibiotics less likely approach. • Treatment decisions often made off-site, influenced by nursing staff with limited lab evaluation. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making
Trautner, 2017, U. S.	Quantitative descriptive. 184 facilities in 14 states; 1626 respondents (439 RNs, 378 LPNs, 5 physicians) and 804 unlicensed (634 CNAs, 170 other)	<ul style="list-style-type: none"> • Licensed staff: <ul style="list-style-type: none"> ○ 90.7% knew asymptomatic bacteriuria common with indwelling catheters; ○ 36.1% knew pyuria does not distinguish between UTI & asymptomatic bacteriuria. ○ 60.1% knew screening urine on admit not appropriate. ○ Surveillance: <ul style="list-style-type: none"> ▪ 39.6% correctly identified date of CAUTI event (present on admit vs. acquired); ▪ 61.4% correctly identified fever as evidence-based symptom of CAUTI ○ Less than 1/3 knew to rub hands for 15 seconds & less than 20% chose alcohol-based hand rub as most effective. ○ PPE: 26.1% knew standard precautions vary based on infection status. 	<ul style="list-style-type: none"> • Elements of antibiotic stewardship in NHs • Nursing's influence on prescriptive decision-making • Nursing staff's antibiotic stewardship responsibilities

		<ul style="list-style-type: none"> • Unlicensed staff: <ul style="list-style-type: none"> ○ 99.6% knew fever & new-onset confusion should be reported. ○ 89.4% knew treating asymptomatic bacteriuria can lead to MDROs. ○ 88.3% knew hand hygiene & limiting antibiotic overuse prevents the spread of MDROs. ○ Surveillance <ul style="list-style-type: none"> ▪ 57.9% recognized criteria for new/ worse change in mental status. ▪ 26.6% correctly identified fever & not urine color/odor/ cloudiness as sign of CAUTI; ○ 25.2% correctly identified how long to rub hands when washing. ○ 10.6% knew most effective cleansing agent ○ PPE: 16.5% knew correct application of standard precautions. 	
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CHAPTER 5: TAKING CHARGE AND FLEXING PROTOCOLS: A QUALITATIVE DESCRIPTION OF SNF NURSING STAFF'S UTI IDENTIFICATION

Abstract

Skilled nursing facility (SNF) residents are at increased risk of acquiring multi-drug resistant organisms due to inappropriate antibiotic use, which accounts for up to 75% of all SNF antibiotic prescriptions. The most common indication for antibiotic use in SNFs is urinary tract infection (UTI). The structure of SNFs create barriers to appropriate diagnosis and treatment of UTIs, with the limited registered nurse availability and health care providers (HCP) being off-site. Existing literature lacks a description of nursing staff identification of UTIs and what takes place prior to contact with the HCP. This qualitative descriptive study describes SNF nursing staff experiences with residents whom they suspected were presenting with a UTI. Study participants identified SNF residents' behaviors that were 'way out of their norm,' as a key indicator of a UTI. Recognition of changes indicative of a UTI were dependent on nursing staff knowing the resident well enough to differentiate between signs and symptoms associated with UTI and other medical conditions. Approaches to care included nursing staff were taking ownership, or responsibility, and flexing protocols to prioritize the care and well-being of the residents.

Keywords: nursing staff, licensed practical nurse, nursing assistant, identification, urinary tract infection, skilled nursing facility, nursing home

Introduction

Nearly 4 million people in the United States (U.S.) reside, either short-term or long-term, in skilled nursing facilities (SNFs) per year (Harris-Kojetin et al., 2019). In SNFs, superinfections, or multi-drug resistant organisms result from inappropriate use of antibiotics. According to the Centers for Disease Control and Prevention (CDC, 2017), as much as 70% of these residents receive at least one antibiotic each year, most commonly for a urinary tract infection (UTI). As many as three-quarters of prescribed antibiotics are inappropriate and result in adverse outcomes including the development of multidrug resistant organisms (Ashraf et al., 2020; CDC, 2017, 2020a, 2020b, Loeb et al., 2001; Nicolle et al., 2019; Stone et al., 2012).

Within eastern North Carolina (NC), there are 145 SNFs (NC Department of Health Service Regulation [DHSR], 2021; U. S. Department of Justice, 2022). NC SNF's are only required to have a registered nurse (RN) on-site for eight hours per day (NC DHSR, Nurse Staffing Requirements, 2016), and this RN may be an administrative RN. With health care providers (HCPs) off-site and limited RN availability, it is highly likely that the nurse interacting with the HCP when there is a change in the residents' condition is an LPN (Delgado et al., 2022; Harris-Kojetin et al., 2019).

Current NC standard protocol for the identification of UTI in SNF includes (one of the two) 1. acute dysuria or acute pain, swelling, or tenderness of the testes, epididymis, or prostate or 2. fever or leukocytosis, and at least one of the following: acute costovertebral angle tenderness, suprapubic tenderness, gross hematuria or new or marked increase in incontinence (Hoffman, 2021). By state law, all SNF nursing staff implemented this protocol in 2017 and education on its use was widely conducted among all NC SNFs in the year prior.

This study, approved by East Carolina University's (ECU) University & Medical Center Institutional Review Board (UMCIRB), sought to describe what occurred prior to nursing staff contacting the HCP when they suspected a UTI. The overarching research question was: What is the lived experience of SNF nursing staff in Eastern North Carolina who suspect that a resident is experiencing changes which may be indicative of a UTI? To answer the research question, the following study aims were developed:

Aim 1: Describe the lived experiences that contribute to nursing staff member's actions related to identification of UTIs in SNF residents.

Aim 2: Delineate common approaches that nursing staff use in the identification of changes which they suspect to be representative of a UTI in the SNF setting.

Literature Review

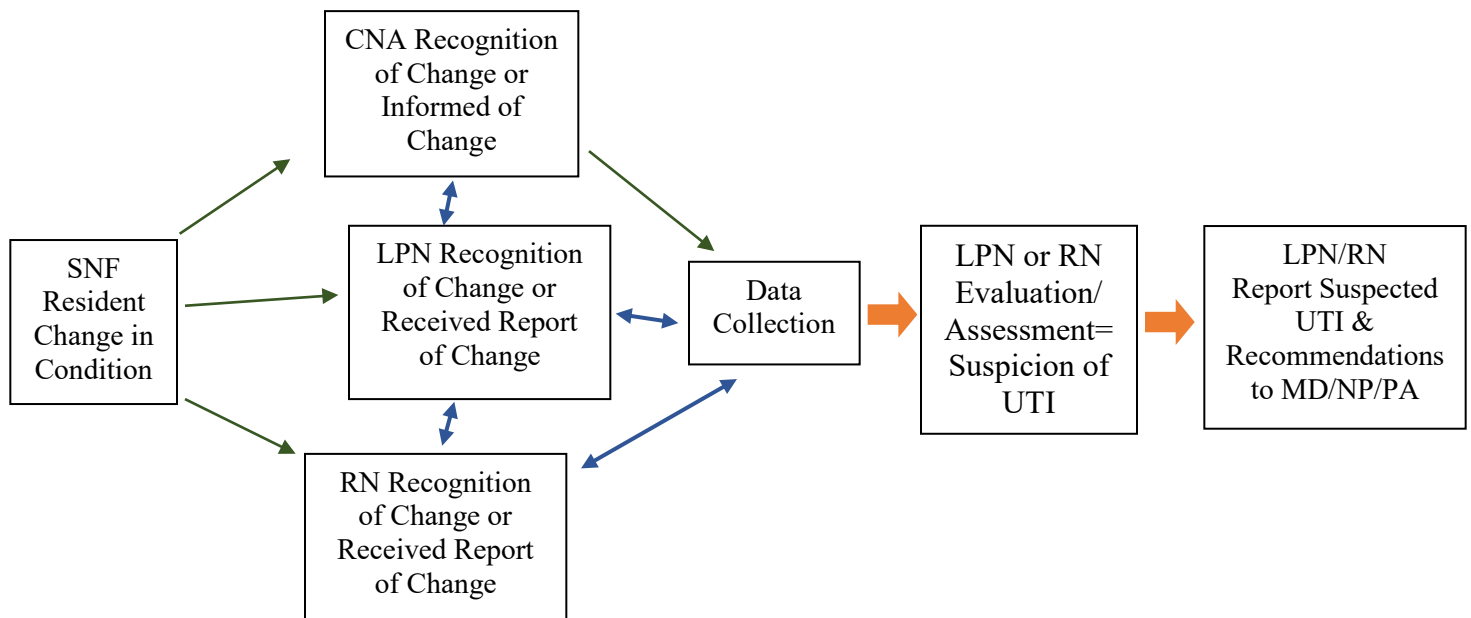
The complexities that exist within the SNF structure, including the unique staff composition and limited evidence-based data, contribute to the challenge of accurate diagnosis and treatment of UTIs (Delgado et al., 2022; Thompson et al., 2020). SNF residents may also be treated for asymptomatic bacteriuria or treated prophylactically due to a history of UTIs; in both cases treatment is not recommended, as there's insufficient evidence on risk versus benefit of treatment in this population (Kistler et al., 2020; Thompson et al., 2020).

Studies in the SNF setting are quantitative in nature, i.e., point prevalence studies, intervention studies, and systematic reviews of clinical trials (Arnold et al., 2021; Biggel et al., 2019; Delgado et al., 2022; Thompson et al., 2020). A systematic review and meta-analysis by Aliyu et al. (2022) identified that antibiotic stewardship programs did not include nurses in the development of their interventions. Studies related to clinical decision-making, diagnosis, and treatment of UTIs primarily focus on HCPs (Delgado et al., 2022; Kistler et al., 2020).

Although the HCP has the professional responsibility of diagnosis and treatment, the information utilized in the decision-making process is heavily dependent on SNF nursing staff (Figure 1; Delgado et al., 2022; Harbin et al., 2022; Song-Beeber et al., 2021). While Song-Beeber et al. (2021) acknowledges CNAs and LPNs play an integral part in data collection, RNs are identified as being responsible for resident assessments and the decision-makers contacting the HCPs. Delgado et al. (2022) identified that further research should clarify the roles, responsibilities, and associated actions of all SNF nursing staff in the identification of UTI. Increased nurse involvement in the development of interventions and an understanding of nursing staff decision-making may enhance the effectiveness of antibiotic stewardship programs (Delgado et al., 2022; Harbin et al., 2022; Song-Beeber et al., 2021).

Figure 1.

Conceptual Framework



Note. Conceptual Framework developed based on Delgado et al. (2022). CNA= Certified Nursing Assistant; LPN= Licensed Practical Nurse; UTI= Urinary Tract Infection; SNF= Skilled Nursing Facility.

Methodology

Design

This qualitative descriptive study used Husserl's (2017) transcendental phenomenology to analyze the essential structures of the participant's acts and subconscious contents, thereby describing the lived experience of SNF nursing staff in the identification of UTI. This approach consisted of the use of epoché, eidetic reduction and intuiting to uncover the true essence of the SNF nursing staff experience. The use of epoché in this study consisted of research team members journaling before and after interviews and before and after data analysis, allowing the researcher to identify personal and/or professional experiences and/or beliefs that could have resulted in baseless assumptions (Husserl, 2017). This process decreased potential biases by allowing the researcher to focus on the data as it was presented.

Data analysis using eidetic reduction is a systematic, time intensive process of immersing oneself in the data while being intentional about setting aside those presuppositions identified using epoché. The iterative process associated with eidetic reduction results in intuiting, or the researcher's ability to elucidate the objectivities, or pure essence of the participant experience (Husserl, 2017; Spiegelberg et al., 1994). The process of eidetic reduction in this study is described further in the data analysis section below. The primary researcher had 19 years of SNF experience and other research team members were experienced nurse scientists having backgrounds in either SNFs or care of the older adult. Reflexivity and acknowledging presuppositions were critical to the integrity of the study.

Setting

Eligible participants were provided the opportunity to select a meeting location in eastern NC with private rooms available. Four out of five participants opted for virtual

interviews. During face-to-face and virtual interviews, only participants and interviewers were present. Interviews ranged from 30 to 48 minutes.

Sample

Due to COVID-19 pandemic regulations restricting researcher entry into SNFs, a semi-stratified purposive sample was obtained using snowball sampling and social media recruitment. SNF nursing staff, already known to the researcher were contacted and asked to refer participants. The study protocol was revised and resubmitted to ECU's UMCIRB after three months of snowballing resulted in one completed interview. An ECU branded and UMCIRB approved post was shared via social media. Long-term care (LTC) nursing staff group administrators serving eastern NC were contacted to request permission to share the approved post on the groups' timelines. Following approval from two group administrators, the information was posted on one nursing group timeline and one nursing assistant group timeline; ten other group administrators did not provide approval, nor a response. Upon initial contact, potential participants were informed of the study purpose and prescreened using a UMCIRB approved recruitment script. Individuals were excluded if they did not meet inclusion criteria, were previously supervised by the interviewing researchers, or were employed in nursing management or administrative roles.

Although a sample size of 10-15 participants was targeted to reach data saturation (Hennink et al., 2022), after 10 months of recruitment efforts, there were five participants. Three potential participants were not interviewed due to one cancelling, one cancelling/rescheduling then not showing up, and one not showing up. These three did not respond to further requests for an interview appointment. The difficulty in reaching this population of nursing staff led the team

to perform an initial review of the raw data and concluded there was sufficient data to cease collection and proceed with data analysis.

Data Collection

Single semi-structured interviews were completed with each participant, using open-ended questions (Appendix E) to promote in-depth reflection and honesty (Creswell & Poth, 2018; Polit & Beck, 2017; Risjord, 2010). At the start of the interview, consent forms were read to participants, and they were provided an opportunity to ask questions and consent or decline to participate; all consented. Demographic data (Table 1) was collected prior to the interview. Interviews began by asking the participants about a time they thought a SNF resident had a UTI. Additional probing questions were utilized to clarify participant responses.

WebEx, a UMCIRB-approved, secure virtual platform, was used to record interviews. Back-up audio recordings were made with a separate digital voice recorder. Following the interviews, WebEx generated a transcript using automatic voice recognition software and recordings were reviewed and modified for accuracy by the researchers. To meet obligations for member checking, all participants were given the option of reviewing the transcripts; two declined and three accepted. Transcripts were sent to the participant's provided email address. None of the three participants requested correction or change to the transcripts.

Data Analysis

The research team determined independent hand-coding was better suited to this data analysis versus use of coding software. Individual review, analysis and coding allowed for greater immersion in the data. The primary researcher listened to each audio recording multiple times to perform interview transcription. A second researcher verified the accuracy of transcription. Two research team members independently analyzed the interview transcripts to

establish intercoder reliability (Creswell & Poth, 2018). Intuiting and reflexivity with each successive reading were an integral part of analysis, resulting in the researchers acknowledging their own presuppositions while unraveling the participants' experiences (Creswell & Poth, 2018; Husserl, 2017).

Data condensation, using eidetic reduction consisted of line-by-line reading, noting significant terms or phrases, and writing memos in the margins of the transcripts (Creswell & Poth, 2018). For this study, significant terms were those that invoked curiosity or a mental or physical response by the reader. Team members individually extracted words and phrases that were representative of the participants' experiences. With each successive reading, transcripts were compared to identify similarities and differences related to emerging concepts. Reflective notes were documented in the researchers' journals. Key word identification was refined with the use of word frequency applications. Deidentified participant responses were uploaded into the applications, which produced word counts, word clouds and two and three-word phrase frequencies for researcher review. Commonly used words or word combinations were then reviewed in the transcripts to determine if they were used in the context of contributing to the identification of UTIs (Miles, 2020).

An in vivo codebook was created from key words and phrases (Creswell & Poth, 2018; Hennink et al., 2017; Miles et al., 2020). Exemplar statements were identified from participant transcripts. During the initial development of the codebook, following the first two interviews, deidentified data was presented to a group of four independent researchers with limited knowledge of SNFs. This use of analytic triangulation increased intercoder reliability and controlled for biases that may have been related to researcher presuppositions (Creswell & Poth, 2018).

Codes and code definitions were added and/or modified as needed throughout the analytic process (Miles et al., 2020). Two team members convened to discuss epoché, which included reflections and acknowledgement of personal assumptions, and the findings of their independent eidetic reduction (Husserl, 2017; Spiegelberg et al, 1994). Analysis of the transcripts continued until no new codes or significant themes related to the study aims were identified.

Results

The study participants consisted of one CNA, two LPNs, and two RNs, with an average of 8 years and 8 months of SNF work experience (13 months to 29 years). Four participants worked full-time hours; two of them were contracted staff. The fifth participant was a part-time employee. Disclosure of the employment facility was deliberately excluded, but all worked at SNFs in eastern NC. One participant referenced having worked in at least three SNFs in eastern NC over their nursing career. Two of the participants acknowledged having acute care experience in addition to SNF experience. Each participant was assigned a pseudonym to be utilized when presenting the results of the study (see Table 1).

Table 1

Participant Demographic Data

Participant job title (Assigned pseudonym)	Highest degree/ diploma/ certificate completed	Other nursing/ healthcare training/ education	Length of employment at current SNF	Total length of SNF experience	Employment status (PT/FT)	Contract or per-diem
LPN (Ann)	LPN Diploma		4 years	29 years	FT	No
CNA (Beth)	NA certification	CPR	2 months	6.5 years	PT	No
RN (Carl)	Bachelor's Degree	Reproductive Health & Surgical Nursing	1 year 2 months	4 years	FT	Yes
RN (Dee)	Bachelor's Degree		1 year, 1 month	1 year, 1 month	FT	No
LPN (Eric)	Diploma		3 years	3 years	FT	Yes

Note: Demographic data for interview participant. CNA= Certified nursing assistant; LPN= Licensed practical nurse; PT= Part-time; FT= Full-time; SNF= Skilled nursing facility.

Interview transcription resulted in 31 pages of participant-only data, after removal of all interviewer dialogue. Analysis of the first transcript resulted in identification of 11 in vivo codes. Four in vivo codes that aligned with codes from transcript one were identified in transcript two. Two in vivo codes were identified in transcript three, which aligned with codes identified from transcript one. Three in vivo codes were identified in transcript four, all aligning with in vivo codes from transcript one and three. No additional in vivo codes were identified from transcript five. Exemplar statements from participant responses (Table 2) to each interview question were identified. The iterative process of code identification, modification, condensation, and the development of participant response matrices, resulted in the identification of 10 pattern codes which were then grouped into three themes, one theme related to Aim 1 and two themes related to Aim 2: way out of the norm (with three sub-themes: odder than normal, going downhill and changed urine), taking ownership, and flexing protocols, respectively.

Way Out of the Norm

Odder than Normal. Although all participants discussed circumstances, signs, and symptoms that they recognized as representative of UTIs, Ann, an LPN charge nurse with 29 years of SNF experience, and Beth, a CNA with 6.5 years of SNF experience, frequently mentioned knowing the resident had a UTI because their behavior was ‘out of the norm.’ Both Ann and Beth referenced the importance of knowing the resident well enough to notice any changes. Ann stated: “With me working with the resident all the time, you know, it doesn’t take much for me to see a change from the way the resident usually is.” In discussing a particular situation where she suspected a UTI and not another condition or disease, Ann stated:

Lethargy began to take place. The patient is not eating. They are not drinking as well as they have. Oh, I know there’s a difference there, the norm for them. Even though they’re

confused we just can't settle with that, just the confusion; go a little further. So, this patient is, is becoming lethargic. They're, they're way out of their norm.

Three of the nurses interviewed spoke primarily of physiological changes, but Beth described the difficulty of recognizing these changes in SNF residents due to other medical conditions, their level of care and the amount of staff assistance they require. When providing care and making observations, Beth relied on residents' cognitive status to alert her to changes which may be indicative of a UTI. Beth shared the following:

If they go to the bathroom themselves, you don't realize how much more they're going. If they use a diaper, you really don't know, realize that there's more in it than normal and you don't realize, or that they're going more than normal. I should say because, you know, sometimes when you go with a UTI, it's just a little bit here and a little there and a little bit... Then they start acting stranger than normal, odder than normal.

Beth went on to share how her familiarity with the residents helped her recognize different behaviors: "You can look at somebody. I don't care if they're bedridden or not and know they're not acting the way they normally do. Or they're just talking to themselves, and they normally don't." She also acknowledged that she learned from nurses that changes in cognitive status were representative of UTIs, saying,

Okay, something ain't right. They're not acting right. Probably a UTI! And that's something I had to learn as a CNA. That's not something I knew in the very beginning. That's something that, as I worked as a CNA that nurses started telling me when somebody wasn't acting right, it was probably a UTI.

Going Downhill. Participants expressed concern related to the potential implications of delayed diagnosis and treatment of UTIs in SNF residents with already complex health conditions. Ann spoke of monitoring residents, when suspecting a UTI, but not for very long before acting "because again, we don't want this to get worse and it can. And with the geriatric

population, it can change very quickly.” She spoke of an experience with a resident who was lethargic, whom she collected a urine sample on, saying:

...but we don't want it to get worse because the patient is already lethargic. And it could get a whole lot worse. A lot of patients have be-, known to be- end up in the hospital, become septic. And that's not where we want it to go. We want to kind- try to catch it as soon as we can.

While Ann spoke in detail about the detrimental progression from lethargy to sepsis, the other licensed nurses in this study spent more time explaining the potential physiological rationale for rapid progression in the older adult. Dee, an RN with 13 months of SNF experience spoke of immunosuppression in older adults and her past experiences, stating: “you give the patients, like, let's say 48 hours and observe.” She then proceeded to explain that if symptoms persist after 48 hours of nursing interventions, treatment is necessary. Eric, an LPN with 3 years of SNF experience spoke of his experience with older adults and his facility using routine testing “because they are more susceptible to get an infection.” Dee also spoke of circumstances which would determine if changes in a resident would require a more emergent response, saying:

mostly the UTI is not treated as an emergency unless it's ... what can I say, it's not treated as an emergency, unless it is complicated. So, and unless it's in patient with, with like renal failure with diabetes. So, if the patient doesn't have metabolic diseases, it's not treated as an emergency.

Like the licensed nurses, Beth spoke of the importance of early recognition of changes to combat the potential rapid progression. However, she also spoke of the difficulty she and other CNAs have experienced with getting the nurse to respond or follow up when they reported cognitive changes in residents that they suspected had UTIs:

The first thing you always have to deal with when you think somebody's got a UTI because of the way they act is your nurse's response of... 'They're just going downhill' instead of just going ahead and checking. They don't; they let it get worse.

Changed Urine. While none of the participants mentioned the appearance of 'normal' urine, they all mentioned abnormal findings in urine, except Beth. The licensed nurses spoke of their observations and knowledge related to the presentation of urinary symptoms. Two of the four licensed nurses, Carl (RN with 4 years of SNF experience) and Dee, reported that women are more likely than men to develop UTIs due to the physiological structure of the female urinary system, and faster ascension of organisms into the bladder. Ann and Dee mentioned foul-smelling urine or urine with a 'strong' scent being present when a resident has a UTI. However, Ann also implied that it might be the result of poor hydration, stating "their urine may smell foul. But older people are not drinkers, they, it's hard to get fluids within them."

Dee described some of the abnormal findings she has seen in SNF residents' urine samples including cloudy urine and urine with reddish stains. She provides another example of urine changes in the older adult when she states: "The color of the urine usually changes and it is like, it's Cola, you know, the, the Cola soda. So, the urine of this older, elder patients that we take care of will have that color there, the Cola color." In addition to the abnormal appearance of urine, Dee and Eric identified urinary frequency and urgency as indicators of UTI. When discussing her SNF experience, Dee also reported residents with UTIs presenting with urinary incontinence and burning upon urination.

All the licensed nurses in this study mentioned the importance of testing urine samples, however there were discrepancies among which test they viewed as meeting the standards for UTI diagnosis. Ann mentioned automatically doing a urinalysis (UA) and urine culture and

sensitivity (C&S) when she suspected a UTI. Dee acknowledged the need for both a UA and urine C&S, however she identified the presence of white and red blood cells in the UA as confirmation of a UTI and the urine C&S as being used to identify the causative organism and determine appropriate treatment. Carl reported that the urine C&S is the 'sure test' for diagnosis of UTIs. Eric mentioned that the urine C&S was necessary to test for bacteria and white blood cells in the urine.

Dee was the only one to describe how she collected these samples. She reported that most of the older adults she cared for in the SNF had catheters and that the urine sample was collected directly from the drainage bag. Eric was the only one to mention that his facility performed monthly routine testing on more susceptible residents. When asked about the rate of positivity with this routine testing, Eric estimated that on average 45% of these tests are positive for bacteria and they were usually treated with an antibiotic.

In contrast to the nurses' experiences, Beth spoke of the difficulty with recognizing urinary changes such as frequency, urgency, and urine appearance among both continent and incontinent residents. She compared changes observed with UTIs to other infections:

Because it's usually their mental health that, that makes you realize it's a UTI. I know if it's a infection in their foot, you're going to see it. Your, if it's infection, ear infection, you're not going to see it, but you may see some drainage or you're going to see something. It's going to be red. You're going to notice something about that ear that's going to make you realize: 'Hey, this may be infected.' You don't notice that too much for the UTI. With the UTI, it's, you notice it more about how the patient is acting.

Taking Ownership

A common finding among the nursing staff in this study was that they all acknowledged that the first step to caring for SNF residents, identifying changes indicative of a UTI, and providing adequate follow-up care was to accept responsibility. The level of responsibility

varied from meeting the residents' basic physical needs to providing psychological support. The licensed nurses also shared their responsibility as it relates to knowing the resident well enough to recognize changes and managing the residents' medical conditions. During Ann's interview, she immediately expressed her authority as LPN charge nurse in her facility, stating: "I'm charge nurse of the unit. So, I'm in charge of that whole unit. Anything comes up with the resident, I am responsible." Carl reported his responsibility as "totally owning the patient," from medication administration to providing education on disease management.

Dee discussed the nurse being the first point of contact for SNF residents, as they admit the resident and establish the care plan. She reported that nurses are with the residents every day, and this contributes to the nurse's ability to build a relationship, establish rapport, become their confidant, and recognize changes. Much like Dee, Eric spoke to connecting with residents, "you know, as a nurse, you provide health care and also advocate for the patients... you tend to find a deeper connection... they end up telling you things maybe that they have not told the physician." Dee, Ann, and Eric all acknowledged that the relationships they have with the residents result in most HCPs trusting their opinions and reported suspicion of UTIs. Eric stated:

Sometimes, you know, there's those physicians who either, look down upon nurses.

There are those, let's say, like 80% they tend to listen to you, to give your opinions about the patients... the nurse actually stays with the patient a lot of the time. So, you know them better than the physician. So, they tend to listen most of the time. Or, and honor your opinion.

Although none of the nurses mentioned CNAs during their interviews, Beth stressed the importance of CNAs taking accountability and being responsible for recognizing even the most minute change in a resident. Beth also expanded on the idea of nursing staff taking ownership

and accountability of residents, as she explored the differences between staff on different shifts and staff hired by the facility in comparison to those hired by agencies. She explained that her night-shift responsibilities varied from other shifts, even as it related to UTIs. She discussed how night shift staff didn't collect urine samples for testing and that she never had contact with HCPs as she had never seen one come in during her shift in her 6 years of SNF experience. She also discussed her experience with facility staff in comparison to traveling or contract staff, stating:

Or you get agency in there and they don't care. When you get them, even if they've been in there two weeks. And they know this resident, how this resident acts, agency does not care for the residents like you, we do; the ones employed by that facility. They just don't... I've saw that way too many times. And way too much. One reason I left (facility A). (Facility A) went down the minute they started letting agency in.

Flexing Protocols

Although all participants did not specifically use the word protocol, they all referenced steps they followed when determining how to respond to suspected UTIs. The importance of early detection and rapid intervention was discussed by all participants. Ann frequently mentioned the need to follow her facility protocol. She acknowledged the need to notify the physician if there were problems, and notification taking place on the day a change is noticed. However, at another point in her interview, Ann reported that it was protocol to automatically collect a UA and urine C&S when suspecting a UTI. She mentioned the need to get an order, but not having to notify the HCP for this order because of the protocol and that, "the doctor is notified if it gets worse."

Carl discussed the importance of knowing the specifications for UTI diagnosis, including the signs and symptoms, but acknowledged that he relied heavily on the resident's history when identifying UTIs. He also stated "So, at times we might do protocols, but such kind of instances we might flex them a bit" when referring to emergent situations in which he has bypassed protocol, such as someone presenting with a change in orientation or consciousness. Beth mentioned that when a CNA recognized a change in a resident that may be indicative of a UTI, "the only thing we can do is recognize 'hey, something ain't right' and go to a nurse." Beth also discussed how some CNAs failed to follow through and report when they recognized a change for various reasons, including not wanting to communicate with some nurses.

Table 2

Participant Response Matrix

Participant (role/years of SNF experience)	Q1. Please tell me a story about a time you thought a resident might have a urinary tract infection.	Q2. Can you describe what made you think they had this infection?	Q3. What happened after you recognized that the resident might have a UTI? What did you do next?	Q4. Who did you talk to about your suspicions? (if not mentioned in response to #3)	Q5 CNA. What is it like to communicate your belief that the resident has a UTI to the nurse?	Q5 Nurse. What is it like to communicate your belief that the resident has a UTI to the health care provider?
Ann (LPN, 29 years)	"They become lethargic, and, um okay, so that's a clue that there's something unusual going on with them. Their urine may, ah, may smell foul. But older people are not drinkers, they, it's hard to get fluids within them. So, we began to push the fluids, um, if the lethargy is still there and doesn't clear and just added confusion to what's already there. Then I know I need to go a little further."	"Because along with their dementia, um, confusion already, their- Um, lethargy began to take place. The patient is not eating. They are not drinking as well as they have. Oh, I know there's a difference there, the norm for them."	"Then the order's written, because they always have to have an order even though it's protocol... We don't have to notify the doctor for that because it's already in place. So, the urine is obtained, and it's sent off. Um, and we, ah, wait for the results to come back."	I'm in charge of that whole unit. Anything comes up with the resident, I am responsible. Um, I can report to my Director of Nursing if there's something that, if I have questions or whatnot. I'll, I notify the doctor if there are problems."		"Usually, she, you know she will say, 'well just, you know, you're suspecting this' and a lot of the time she will come, and she will observe the resident herself."
Beth (CNA, 6.5 years)	"I know one particular resident that wasn't acting right, they thought had sundown syndrome. He was fine going in and my question was 'why all of a sudden does he have sundowns since he's here?' And it turned out to be a UTI"	"They're not acting right. Probably a UTI. And that's something I had to learn as a CNA. That's not something I knew in the very beginning. That's something that as I worked as a CNA that nurses started telling me when somebody wasn't acting right it was probably a UTI."	"Anything that's wrong with a resident, like that, you're going to go straight to your nurse." "Our only thing we can do is recognize 'hey, something ain't right' and go to a nurse. That's all we can do"	(Mentioned in response to Q3)	"I've always had such good relationships with them. I can go to them easily and just say 'hey, what's going on with this one? What do you think?' And we can have a conversation about it, you know. Or they'll go check it out and say 'we'll see what's happening next, tomorrow night'"	
Carl (RN, 4 years)	"Infection that lasted for around, for 3 days I think...lower abdominal pain, back pain,,, pain in menstruation...in the females, part of the	"One of the primary signs and symptoms will be abdominal, you have a pain, you have a headache, and you have pain during	"The next step in management, you need to take a sample for culture and sensitivity because that is the sure test...after these, this patient needs to	"There's the in-charge or the person supervising...then there's the resident doctor"		"I discussed to them and they give the way...they sustain the protocol for management"

	reproductive health, it's very common"	menstruation. Those are like the gold standards of checking urinary tract infection"	start being on antibiotics and then you need to start administering, this patient needs to start hydration"			
Dee (RN, 1 year, 1 month)	"She was complaining of urinary urgency, and frequency, that is going to the toilet and voiding little urine for very many times, and also she complained of burning sensation while urinating... The woman was complaining of pelvic pains. So, that's definitely when you hear about burning sensation, pelvic pains, and urinary urgency and frequency then diagnosis that you give not, the first diagnosis that you think of is a UTI"	In addition to Q1 response: "Older adults mostly...they will also have urine incontinence...will mostly have an indwelling catheter...the color of the urine changes and it is like, it's Cola, you know the Cola soda. So, the urine of this older, elder adults that we take care of will have that color there, the Cola color and...they are in much pain"	"We asked for a urine sample and when we examined the urine sample, you could see it was cloudy and had some reddish stains; and it was also, had a very strong scent" "So that combined with pain and the fevers, it would lead to that and so to be sure we perform the urinalysis. Which showed that she had white blood cells and red blood cells in her urine. And that definitely confirmed that she had a UTI"	"Apart from the patient, so after you have noticed that the patient has got a UTI, we call in the doctor...first you report to the it to the nursing manager. And so, when you tell the nursing manager we have a patient with a UTI, the nursing manager will definitely call a doctor"		"Most of the time, because, let's say, we are a team, let me say in the medical field we are teammates... you have seen that the patient has the symptoms for UTI and you report to the doctor, you tell them the signs that the patient is experiencing and how the patient is feeling. And you tell the doctor the management you have so far had on the patient... We will go hand in hand...and examine the patient further... We share ideas on how, on the appropriate management to carry, to perform on the patient for the maximum, for the best management"
Eric (LPN, 3 years)	Most of the time they present with signs and symptoms. For example, itchiness, or pain on menstruation, urgency, and frequency, frequency to urinate..."	In addition to Q1 response: "It's either UTI or sexually transmitted disease, so we have to do urine microscope culture..."	"You take a urine sample, check if there's bacteria and white blood cells to diagnose if it's a UTI or STI. Most of the time it's a urinary tract infection" "We tell them to improve on personal hygiene...and also tell them to hydrate a lot...and also give them antibiotic...offer psychological support"	"When you find out that a patient has a UTI, first, you, you notify the doctor...And we'll orders the lab tests and do some investigation"		"So, when we come into contact with the physicians and consult them, we come up with a solutions since we are all healthcare provider, we tend to work as a team...Sometimes there's those physicians who either look down upon nurses; there are those, let's say like 80% they tend to listen to you...you know them (the resident) better...so they tend to listen most of the time, or, and honor your opinion"

Discussion

The theme “way out of the norm” illustrated knowing the resident. Whether in an SNF for a short period of time or remaining there for the long-term, the more time nursing staff spend with a resident, the higher the likelihood of them recognizing a change from the residents’ baseline, or ‘norm’ (Agency for Healthcare Research and Quality [AHRQ], 2014). Such ability to recognize a change in the resident was emphasized by these participants. As compared to younger adults, older adults may not present with the signs and symptoms that are appropriate for intervention and/or treatment based on the surveillance and diagnostic criteria established by experts (AHRQ, 2014). This group of SNF nursing staff noted that recognition of a resident’s change from ‘the norm’ may be the only thing that prevents progression of infection to sepsis and even death, called “going downhill.” Noticing a change in the urine was reported as part of understanding deviation from norm and the difficulties of assessing the quality of the urine of issue. These participants clearly felt that their relationship with the resident was a critical part of their decision-making and was vital to recognizing UTI. In general, they did not consider the change in cognitive status as a symptom of an alternate cause such as dehydration, but rather, jumped immediately to the UTI conclusion. Knowing the patient was the key.

The theme of “taking ownership” for this group of nursing staff showed their sense of responsibility for the resident. They remarked on the chain of report from CNA to nurse (LPN or RN) to HCP, but also emphasized the critical nature of role responsibility at the bedside care level for capturing UTIs and acting. The decision to act may be based on experience and the relationship with other nursing staff. Such decision making is not captured in the literature.

The “flexing the protocol” theme clearly illustrates the dichotomy between awareness of established policy and procedure versus actions taken by the staff. Participants essentially

“talked the talk” but then acted based on personal view or experience which may not be in alignment with the policy and procedure. Much of the literature emphasized the HCP decision-making and prescribing based on evidence-based practice but based on these results, their decisions could be influenced, not on objective evidence, but on intuition and/or subjective evaluation by the nursing staff.

It is apparent from the results of this study that the contributions of CNAs in the identification of UTIs is vastly undervalued. Despite CNAs spending the most time with SNF residents, nurses reported that they knew the residents best, were their confidant and advocate, and were the first to recognize a change in the residents under their care. Interestingly, the CNA remarked on the importance of the communication with the nurse, but that was not reciprocated. Although it was difficult to ascertain the degree to which CNAs contribute to UTI identification in this study, national recommendations report that CNAs should be highly involved in the early stages of identification, due to the amount of time they spend with residents in comparison to HCPs and nurses (AHRQ, 2014).

Strengths and limitations. Use of Husserl’s transcendental phenomenological method has been criticized as having limited ability to uncover the true essence, or objectivity of a phenomena (Erciyas, 2019; Spiegelberg, 1994). Essence is purely subjective and dependent on many factors, such as any number of the individual’s personal experiences, but this is exactly why the method was useful for this study and presents as a strength. The unique interactions between nursing staff and residents during the identification of UTIs in SNFs require subjective descriptions. The data collection and analytic procedures utilized in this study presented as strengths. The primary researcher was fully immersed in the data, by performing and transcribing all interviews, and being heavily involved in data analysis. In addition, performing

semi-structured, open-ended interviews allowed the participants to share as little or as much information as they deemed important in the process of UTI identification.

The primary limitation of this study was that data collection was impacted by the COVID-19 pandemic. Recruitment and data collection procedures had to be altered. Researcher access to SNFs was prohibited leaving the researchers to rely on word of mouth and social media for recruitment efforts, at a time when many nursing staff members may have been spending more time at work and less time on social media due to SNF outbreak related staffing issues. Recruitment efforts were further limited by SNF administration being reluctant, and on multiple occasions refusing to distribute recruitment flyers to their staff, stating it was against their organization's policies, despite being informed that facility and resident names would not be mentioned in any resulting publication and that SNF practices and policies were not under scrutiny in this study. Despite these limitations, the final data set was rich, informative and enlightening.

Implications. This study provides a previously unexplored description of SNF nursing staffs' experience related to recognition and identification of changes in residents that may be indicative of a UTI. The findings of the study highlight SNF nursing staff perspectives and experiences that impact their ability to identify changes in residents, how they approach the decision-making process, and how they delineate which changes are representative of UTIs. The delineations between recognition, identification, and diagnosis of UTIs could benefit from further study. We cannot provide education, for example, until we identify the learning needs and those cannot be identified without access to SNFs. A key component to adequately caring for the SNF resident is the prevention of UTI. Although not addressed in this study, it would be essential to evaluate nursing staff knowledge before testing interventions to improve prevention

and care of resident UTIs. Finally, the lack of CNA involvement in this study, as well as the nurses' failure to mention the role of the CNA represents an area for further inquiry.

Conclusion

SNF nursing staff have a sense of responsibility to their residents that results in them being heavily involved in the process of UTI identification. SNF nursing staff actions are impacted by the amount of time they spend with residents, the relationships they establish, and their prior experiences. While SNF nursing staff acknowledge facility protocols and try to adhere to them, in many cases their decision-making is greatly influenced by their sense of advocacy and knowing the resident beyond the physiological changes that experts recognize as surveillance and diagnostic criteria. The need to include the SNF nursing staff is critical to understanding the exploration of practices, and the improvement of care provided to SNF residents. This study illustrates the tremendous need for education amongst SNF organizational owners and facility leadership to garner support and permission to access their facilities. This access may lead to an accurate capture of the powerful voices of SNF nursing staff and clear identification of their role in the care of the resident. Use of SNF staff in research can document the level of devotion and commitment they feel toward residents, but also, provide opportunities for training to further improve their care. Understanding what the SNF nursing staff are actually doing and how they may or may not use established protocols, can improve the effectiveness and sustainability of interventions used in UTI identification, reporting, and management.

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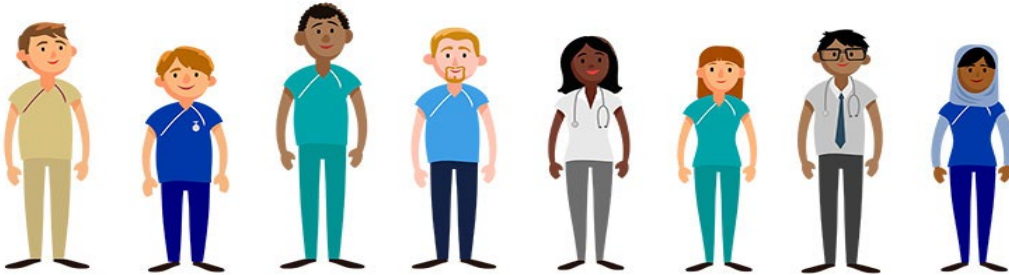
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WE NEED YOUR EXPERTISE!!



Skilled Nursing Research Team in need of your help!

Share your perspective to help improve care.

The purpose of this study is to describe the lived experience of nursing staff who work in the skilled care setting and have encountered a resident whom they suspected may have had a urinary tract infection.

If this is you, please contact the researcher listed below to see if you qualify for participation. Individuals who qualify will be scheduled for a private interview. Flexible scheduling available.

Compensation for your time may be available.

Contact:

Kimberly Delgado

Delgadok18@students.ecu.edu

Phone #: (252) 327-2569

Appendix C. Facebook Recruitment Post

**Are you an RN, LPN, or CNA
in a Skilled Nursing Facility (SNF)?**



If you have at least 1 year of experience caring for older adults in a SNF in Eastern, NC we want to hear from you!



SKILLED NURSING FACILITY RN'S, LPN'S, & CNA'S...WE NEED YOU!

If you are a nursing staff member this research team wants to share your perspective. We are a team of researchers from East Carolina University®, seeking to describe the lived experience of nursing staff who work in the SNF setting and have encountered a resident whom they suspect may have a urinary tract infection.

If that's you, please contact Kimberly Delgado, PhD(c), BSN, RN at (252) 327-2569 or delgadok18@students.ecu.edu. Individuals who qualify for this research study will be scheduled for a private interview and asked to complete a short questionnaire. Interviews are expected to last 30-60 minutes. The identity of all participants will remain confidential. Compensation for your time may be available.

Appendix D. Demographic Questionnaire

Date: _____ Time: _____

1. Job title (Please circle one): CNA LPN RN
2. Highest degree/diploma/certificate completed: _____
3. Any other nursing or health care related training or education: _____

4. Actively employed at an SNF as a CNA, LPN, or RN? _____
5. How long have you been employed at current facility? _____ years _____ months
6. Total length of employment in an SNF: _____ years _____ months
7. Employment status or equivalent (part-time or full-time): _____
8. Contract or per diem (Please circle one): Yes No

Appendix E. Interview Guide

1. Please tell me a story about a time you thought a resident might have a urinary tract infection.
2. Can you describe what made you think they had this infection?
3. What happened after you recognized that the resident might have a UTI? What did you do next?
4. Who did you talk to about your suspicions? (if not mentioned in response to #3)
5. If CNA: What is it like to communicate your belief that the resident has a UTI to the nurse?

If LPN or RN: What is it like to communicate your belief that the resident has a UTI to the healthcare provider?

Appendix F. Recruitment Script

My name is Kimberly Delgado. I am going to share some information with you about my research study; feel free to ask any clarifying questions you may have. The purpose of the study is to describe the experience of nursing staff in skilled nursing facilities who suspect that a resident may have a urinary tract infection. During the interview, I (primary researcher) will be reviewing the research consent form and providing you with a brief questionnaire to complete. This questionnaire asks about your educational preparation and employment status, much like the questions I will ask you during this call. Your identity will not be disclosed in any reports or publications that result from this study.

If you are interested, I will ask you a few questions to determine if you qualify for participation.

9. Are you actively employed at a skilled nursing facility?
10. What is your role/job title?
11. Have you been supervised by myself or Dr. Donna Roberson? (interviewing researchers)
12. How long have you been employed at your current facility?
13. Over the last four years, how many years/months have you been employed at any skilled nursing facility?
14. What is your current employment status? (part-time or full-time)
15. Are you a contract or per diem employee? If so, how many hours per week are you working in a skilled nursing facility?

Appendix G: IRB Approval Letters



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
4N-64 Brody Medical Sciences Building- Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office 252-744-2914 · Fax 252-744-2284
redc.ecu.edu/umcirb/

Notification of Amendment Approval

From: Social/Behavioral IRB
To: [Kimberly Delgado](#)
CC: [Dorina Robinson](#)
Date: 9/21/2021
Re: [Arnel UM CIRB 21-000769](#)
[UM CIRB 21-000769](#)
Nursing Staff Identification of UTIs in SNFs

Your Amendment has been reviewed and approved using expedited review on 9/19/2021. It was the determination of the UM CIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further changes to this approved research may not be initiated without UM CIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UM CIRB. The investigator must adhere to all reporting requirements for this study.

If applicable, approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Delgado Demographic Questionnaire(0.03)	Surveys and Questionnaires
Delgado Dissertation Proposal(0.03)	Study Protocol or Grant Application
Delgado Informed Consent (0.09)	Consent Forms
Delgado_ Recruitment Flyer(0.04)	Recruitment Documents/Scripts

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(l)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in Items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
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rede.ecu.edu/umcirb/

Notification of Amendment Approval

From: Social/Behavioral IRB
 To: [Kimberly Delgado](#)
 CC: [Donna Roberson](#)
 Date: 1/26/2022
 Re: [Ame2_UMCIRB 21-000769](#)
[UMCIRB 21-000769](#)
 Nursing Staff Identification of UTIs in SNFs

Your Amendment has been reviewed and approved using expedited review on 1/25/2022. It was the determination of the UMCIRB Chairperson (or designee) that this revision does not impact the overall risk/benefit ratio of the study and is appropriate for the population and procedures proposed.

Please note that any further changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must adhere to all reporting requirements for this study.

If applicable, approved consent documents with the IRB approval date stamped on the document should be used to consent participants (consent documents with the IRB approval date stamp are found under the Documents tab in the study workspace).

The approval includes the following items:

Document	Description
Delgado Dissertation Proposal(0.05)	Study Protocol or Grant Application
Delgado Informed Consent (0.11)	Consent Forms
Facebook Recruitment Post(0.02)	Recruitment Documents/Scripts

For research studies where a waiver or alteration of HIPAA Authorization has been approved, the IRB states that each of the waiver criteria in 45 CFR 164.512(i)(1)(i)(A) and (2)(i) through (v) have been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000765 East Carolina U IRB #1 (Biomedical) 1060000418
 IRB00003791 East Carolina U IRB #2 (Behavioral/SO) 1060000418

