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Telenursing
A Concept Analysis

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The national nursing shortage is affecting hospital leaders in their ability to employ nursing staff. Nursing staffing shortages contribute to extended nurse-to-patient ratios and increased workload for staff. Increased workload contributes to missed nursing care and correlates with increased patient length of stay, readmission rates, patient safety errors, and hospital-acquired infections. Telehealth services have shown initial improvements in care quality outcomes but have not addressed nursing workload or nursing shortages. Telenursing has potential to provide additional nursing support to offset the workloads of bedside nursing staff and break the associated cycle of adverse outcomes. Various definitions of telenursing are present in the literature, but a concept analysis of telenursing has not been published. Understanding the concept of telenursing is necessary to integrate this concept within the context of researching nursing shortages and patient and nurse outcomes in acute care hospitals. The author used Walker and Avant's eight-step procedure to define the concept of telenursing and present a model case, a related case, and a contrary case to describe the telenursing concept. This concept analysis helps to provide clarity around the concept of telenursing and directions for future research. Understanding the concept of telenursing is necessary to integrate this concept within the context of researching nursing shortages, nursing satisfaction, and patient and nurse outcomes in various healthcare settings.

KEY WORDS: Concept analysis, Nursing, Telenursing, Telehealth, Virtual nursing

T he United States is experiencing a nursing shortage as the demand for nurses continues to outpace the nursing supply. Nursing shortages vary by state, with California, Florida, and Texas being the most impacted.[1] Several factors contribute to the nursing shortage. The demand for nurses is increasing as the US population grows and the proportion of adults 65 years and older increases.[2] The aging of the nursing workforce is contributing to the decreasing nursing supply, with approximately 20%

considering retirement in the future.[3] The educational system's limited acceptance capacity is also contributing to nursing supply constraints.[2] Nurses are leaving the profession at increasing rates during the COVID-19 pandemic because of job dissatisfaction, stress, and burnout further perpetuating the gap between supply and demand.[4] Telehealth services have been available for years to extend the reach of specialty healthcare providers and expand access to care by offsetting workforce shortages.[5] Telehealth services are often centered around physician collaboration with nurses providing remote support and collaboration mostly in intensive care settings (ICUs).[6] Telehealth and electronic ICU services have shown initial improvements in care quality outcomes[7,8] but have not yet addressed nursing workload or nursing shortages. The COVID-19 pandemic provided an innovative opportunity to study virtual nursing support with the acceleration of telenursing technology.

SIGNIFICANCE

Telenursing has potential to provide additional nursing support to offset the workloads of bedside nursing staff and break the associated cycle of adverse outcomes.[9,10] The national nursing shortage is affecting hospital leaders in their ability to employ sufficient nursing staff. Hospitals account for most of the anticipated demand growth and employ approximately 61% of the nursing workforce.[11] Nurse staffing shortages contribute to extended nurse-to-patient ratios and increased workload for staff.[11] Increased workload contributes to missed nursing care and correlates with increased patient length of stay, readmission rates, patient safety errors, and hospital-acquired infections.[12] Missed care, staffing inadequacy, and nurse-perceived patient safety concerns are associated with higher nursing turnover rate,[12] creating a cyclical problem for hospital systems.

Concept Identification

Searches of the literature revealed various definitions of telenursing but did not reveal an existing concept analysis.[6,9,10,13–24] Understanding the concept of telenursing is necessary to integrate this concept within the context of research on nursing workload, nursing shortages, and patient and nurse outcomes in acute care hospitals.

Method of Development

The author used Walker and Avant's[25] eight-step procedure to conduct the concept analysis. Walker and Avant's eight

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steps include selecting a concept, identifying the purpose of the analysis, reviewing existing uses, defining attributes, outlining a model case and other related or contrary cases, identifying antecedents and consequences, and defining empirical referents.[25] The analysis approach was used to dissect existing definitions and knowledge into a clarified concept.

Summary of Telenursing Use in the Literature

A literature search was completed using CINAHL and MEDLINE (Ovid) databases. MeSH terms included "telenursing," "telehealth" AND "nursing," "telehealth," "telemedicine," "virtual nurs*," and "virtual" AND "nurs*." This search was conducted in subject headings and keywords. The literature search criteria included articles in the English language within 13 years. Articles in other languages, published before 2008, and those lacking definitions of the MeSH terms were excluded. This resulted in 15 articles defining telenursing, telecare, telehealth, and virtual nursing.[6,9,10,13–24] The literature search was then narrowed to the most recent 5 years, which excluded one article from 2011.[23] However, one article from 2008 was retained as it was the only definition to refer to the nursing scope of practice, which was considered a distinguishing feature.[17] Of the remaining 14 articles, two articles were removed because of a lack of clarity surrounding each article's proposed definitions.[9,24] This process resulted in 12 articles of collected research.[6,10,13–22]

The final 12 articles were categorized based on terminology, producing three definitions of telehealth,[6,19,20] one definition of telecare,[13] five definitions of telenursing,[14,17,20–22] two definitions of telehealth nursing,[15,16] and one definition of virtual nurse.[10] Telehealth and telecare terminologies are displayed in Table 1, and telenursing related terminologies are displayed in Table 2. The articles' use of telehealth terminologies was related under the classification of information and communication technologies to facilitate and document interpersonal communication.[13] These definitions provide the foundational context for the more specific term of telenursing.

Telenursing is a subcategory of telehealth.[17] The existing definitions of telenursing vary in the literature,[3,4,10–17,20–22] and commonly include telecommunications technology and an aspect of nursing care. The level of detail surrounding the nursing care aspect varied significantly. For example, Kim et al[14] provided a general statement of nursing care and services, similar to the American Academy of Ambulatory Care Nursing's definition including the nursing domain.[15] In contrast, Watkins and Neubrander[16(p2)] provided additional detail such as "nursing services to patients including consultation, assessment, monitoring, treatment, and patient education." Schlachta-Fairchild et al[17] included nursing practice terminology in their definition and stated that the scope of practice does not change with telenursing. Although this publication is from 2008, it was included in this concept analysis because it was the only definition to consider the nursing scope of practice.

Concept Definition

The definitions found in Table 1 and Table 2 were analyzed and refined to create a conceptual definition of telenursing. The conceptual definition of telenursing is the delivery of care at a distance, using information and communication technologies within the nursing scope of practice. The use of "at a distance" was similar to many definitions using wording such as "remote,"[10,14,26] "across geography,"[19] and "long-distance."[13,16,22] This was an important aspect to include as the root of the word, tele, is from the Greek language meaning "far off."[27] The use of "information and communications technology" clarifies other forms of technology-based communication used in existing definitions. In addition, the use of "nursing scope of practice" was included because it encompasses the functions and activities that RNs are educated, authorized, and deemed competent to perform. This is important to the conceptual definition because nursing scope of practice may vary among states and practice environments. The concept of telenursing applies to multiple disciplines within the nursing domain (eg, licensed vocational nurses, RNs, and nurse practitioners). The application to multiple nursing disciplines further demonstrates the importance of

Table 1. Definitions of Telehealth and Telecare

Author	Year	Terminology	Definition
Carroll[19]	2018	Telehealth	"Utilizing technologies to transmit information over distances for the purpose of improving health" (p230).
Boston-Fleischhauer[6]	2017	Telehealth	"Use of electronic information and telecommunication technologies to support long-distance clinical care" (p85).
Sikka et al[26]	2021	Telehealth	"Telehealth can improve the quality of care delivered by supplementing available services or providing care that may otherwise be unavailable due to time, distance, or resource limitations" (p528).
Huter et al[13]	2020	Telecare	"An intervention that involves regular care support from a professional caregiver delivered via digital technologies from a distance" (p1914).

Table 2. Definitions of Telenursing and Virtual Nurse

Author	Year	Terminology	Definition
Arnaert et al[20]	2021	Telenursing	"The delivery, management, and coordination of care and services via telecommunication technologies within the domain of nursing to provide ongoing monitoring, support and aftercare to… patients from a distance" (p2).
Kim et al[14]	2021	Telenursing	"Use of telecommunications and information technology to provide nursing services remotely… through long-distance information and communications technology" (p1007).
Schlachta-Fairchild et al[17]	2008[a]	Telenursing	"Use of technology to deliver nursing care and conduct nursing practice… Although the use of technology changes the delivery medium of nursing care and may necessitate competencies related to its use to deliver nursing care, nursing process and scope of practice does not differ with telenursing" (p135).
Mancini et al[21]	2020	Telenursing	"Proactive care delivery by a Parkinson's disease nurse specialist through telephone contacts" (p1).
Nejadshafiee et al[22]	2020	Telenursing	"Nursing care and services that can be provided from a distance and includes a wide range of communication technologies such as phone, fax, email, Internet, and video clips to overcome the time and distance barriers to provide better nursing care" (p2).
American Academy of Ambulatory Care Nursing[15]	2017	Telehealth Nursing	"Telehealth nursing… utilizes a variety of telecommunication technologies during encounters to assess, triage, provide nursing consultation, and perform follow-up and care coordination" (p6).
Watkins and Neubrander[16]	2022	Telehealth Nursing	"Leverages technology-based communication platforms to provide distant nursing services to patients, including consultation, assessment, monitoring, treatment, and patient education" (p2).
Schuelke et al[10]	2020	Virtual Nurse	"Expert advanced care nurse who provides oversight of patient care for a specific group of patients via virtual presence… Provides direct patient care from a command center that is remotely located from the patient care unit" (p281).

[a]This publication was included because it was the only definition to refer to the nursing scope of practice.

including nursing scope of practice within the conceptual definition of telenursing.

Defining Attributes

Walker and Avant[25] describe defining attributes as the essential characteristics commonly associated with the concept. The defining attributes of telenursing are touchless care, remote nursing intervention support, virtual integration into direct patient care, and remote interdisciplinary communication and collaboration. Touchless care describes care provided through observational assessments and verbal or technological interventions that do not require physical touch or presence.[6] Touchless care is the only way care can be provided when the caregiver is not physically present, as with telenursing. Remote nursing intervention support is the provision of nursing interventions to support patient care and the bedside clinical care team from afar.[6,9] Intervention within the virtual nurses' scope of practice allows the care team to utilize the telenursing resource at the top of their license and balance the workload of the bedside nursing staff.[9]

Virtual integration into direct patient care describes care provided and documented using technology to interact with the patient, most commonly through two-way video and audio equipment.[10] Having access to the patient's room via video connection and document in the electronic medical record allows the virtual nurse to provide independent care directly to the patient. The final attribute of remote interdisciplinary communication and collaboration describes actively working with interdisciplinary team members using bidirectional communication. Existing telenursing models include interaction between the virtual nurse and bedside nursing staff, physicians, pharmacists, respiratory therapists, other multidisciplinary team members, and patients and families.[18,20,21] The virtual nurse must communicate effectively and display strong collaborative skills to provide quality care without being physically present.

Model Case

A model case provides an example of the concept containing all defining attributes.[25] In the model case for telenursing, Samantha, a virtual nurse, monitors a patient on a hospital's stroke unit via two-way video and audio technology. She completes an observation-based assessment (*touchless care*), noting the patient is less responsive than baseline status. Samantha

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assesses the patient's mental status by checking if the patient is oriented to person, place, and time (*virtual integration into direct patient care*). Samantha calls the patient's assigned bedside nurse via the telephone to escalate her concerns. The bedside nurse enters the room to complete a full neurological assessment while Samantha notifies the physician (*remote interdisciplinary communication and collaboration*). The bedside nurse dictates her assessment to Samantha, who simultaneously documents the assessment in electronic medical record (*remote nursing intervention support*).

The bedside and virtual nurses are alerted to a decrease in patient vital signs by the bedside monitor. Samantha calls for a rapid response while the bedside nurse prepares emergency supplies (*remote nursing intervention support*). As the rapid response team initiates interventions, the virtual nurse enters the physician's orders into the computer and alerts the pharmacy and radiology teams of the time-sensitive orders (*remote interdisciplinary communication and collaboration*). The patient stabilizes. Samantha and the bedside nurse debrief, review completed orders and documentation, and revise the patient's care plan. Samantha monitors the patient's vital signs and completes follow-up intervention assessments at the required intervals, documenting her assessments in the electronic medical record (*virtual integration into direct patient care*).

This model case includes telenursing's four defining attributes. Samantha's observation-based neurological assessment represents touchless care. Activating the rapid response team and entering the physician's orders are examples of remote nursing intervention support. Samantha engages in remote interdisciplinary communication and collaboration by alerting the ancillary departments and discussing the patient's care plan with the bedside nurse. The final attribute of virtual integration into direct patient care is seen with Samantha's follow-up intervention assessments and documentation in the electronic medical record.

Related Case

A related case is the use of telesitters using audio and video technology to monitor at-risk patients. In this example, a patient on a hospital's stroke unit is confused and at increased risk of pulling on the attached peripheral IV tubing and falling. The bedside nurse places a video monitor in the patient's room and requests a telesitter. The telesitter is an unlicensed care provider who monitors up to 20 patients from another part of the hospital. The telesitter will alert the bedside nurse by alarm or telephone if the patient pulls on the attached tubing or attempts to ambulate.

This example is a related case because only the attribute of touchless care was present. Although remote support was also present in this example, it included nonnursing personnel, unlike the telenursing attribute of remote nursing intervention support. Communication was also present in the related case,

with the telesitter alerting the bedside nurse to patient behavior. However, this was a reactionary supportive measure as opposed to bidirectional communication and collaboration. The final attribute of virtual integration into direct patient care was not present in the related case. The telesitter assists with monitoring the patient's activities but does not provide or document direct care to the patient.

Contrary Case

A contrary case is that of a unit charge nurse providing care to a patient when the patient's nurse is busy with another task. In this example, a bedside nurse is busy admitting a new patient when a medication is due to be administered to another patient. The bedside nurse asks the unit's charge nurse for assistance, and the charge nurse obtains the medication and administers it to the patient. This example is a contrary case because the charge nurse is physically present on the unit and assists staff by providing hands-on care, such as medication administration, when needed.

Antecedents and Consequences

Antecedents are items or events that must be in place prior to the concept occurring.[25] For telenursing to occur, there must be a lack of onsite resources and expertise or barriers in the patient reaching the care facility. This gap must be present because telenursing would not be needed if ample resources and accessibility were present. Information and communications technology infrastructure is also needed to provide the required technology, documentation, and support services for this level of virtual interaction. Similarly, organizational policies, procedures, and educational requirements of telenursing must also be present. This includes processes and expectations of the virtual nurses and bedside staff using the telenursing technology. In addition, the delivery of nursing care at a distance must be present for telenursing to occur.

Conversely, consequences are the outcomes occurring as a result of the concept.[25] The consequences of telenursing include continuity of care, balance in nursing workloads, early detection of patient deterioration, and improved patient safety and quality of care.[10] Patient and nursing satisfaction are also consequences of telenursing. Emerging literature supports these as positive consequences when adequately explaining, implementing, and utilizing telenursing.[9,10,13,18] However, additional studies are needed as implementation and achieving staff support can be challenging.[9,18] Potential negative consequences include disengagement and loss of skills by the bedside nursing staff. For example, bedside nurses may lose proficiency in specific tasks or documentation methods if the virtual nurse routinely completes those items. The virtual nurse also risks losing skill competency and familiarity with bedside processes and the hospital work environment.[18]

Empirical Referents

Empirical referents are defined for the attributes whereby their presence demonstrates the concept.[25] The empirical referents do not measure the concept itself but can promote recognition or measurement of defining characteristics for the concept.[25] Empirical referent for telenursing is the ability to provide nursing interventions to assist direct patient care without physical presence. This can be assessed through documentation of provided interventions and interdisciplinary communication by the virtual nurse. Additional measurements may be completed through nursing employee engagement and patient satisfaction surveys specifically related to telenursing communication competence.[28]

LIMITATIONS

A limitation of this study is the lack of instruments or tools to comprehensively measure telenursing. The current literature is limited in studies measuring empirical referents and the outcomes of telenursing related to documentation, effective communication and intervention support, and nursing satisfaction. Future studies will need to comprehensively measure the telenursing concept in the hospital and ambulatory care settings.

CONCLUSION

This article presents the first concept analysis on telenursing. Refining existing definitions of telenursing was needed to provide clarity and understanding of use in practice. This concept analysis offers a new definition, essential attributes, antecedents, consequences, and example cases in the context of the acute care setting. This work may also guide nurse clinicians, researchers, and healthcare leaders to better understand, apply, and study telenursing. Nursing shortages and increasing nursing workloads are compelling healthcare organizations to move toward telenursing technologies. This concept analysis provides a foundation for industry leaders to build and promote telenursing workflows.

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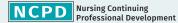
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