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Virtual Nursing: Improving Patient Care and Meeting Workforce Challenges

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What Is Virtual Nursing?

As with distance learning and remote work, telehealth, the provision of healthcare remotely through communication and information technology, predates the COVID-19 pandemic. It became more visible and was used more often during the pandemic. Prior to the pandemic, the Agency for Healthcare Research and Quality (AHRQ) noted the potential for telehealth to transform patient safety by replacing episodic care with constant connection between patients and providers. During the pandemic, AHRQ noted patient safety implications of telehealth in limiting COVID transmission. Telehealth during the pandemic advanced patient safety, for example, by using an initial telehealth visit to remotely triage a patient with COVID symptoms, and then guide them to the appropriate level of care. But the rapid implementation of telehealth during the pandemic may have resulted in patient safety concerns, especially in telehealth versions of episodic care in which limitations in communication, inability to conduct physical exams, and reliance on patients and families to measure vital signs could contribute to diagnostic error.

In contrast to these rapid, ad hoc implementations of telehealth, virtual nursing is part of a tested model of healthcare that predates the pandemic and aims for better connection of the patient with their healthcare team, as opposed to substituting telehealth for elements of traditional care.[1] As used in the Virtual Integrated Care (VIC) team model, the virtual nurse is an expert advanced practice nurse who is a member of a healthcare delivery team with six core roles: patient education, staff mentoring, patient safety surveillance, physician rounding, admissions, and discharge.[1] The virtual nurse is based in a command center that is not on the patient care unit and has access to the electronic health record. In the initial VIC model, patient rooms in medical-surgical units at two different community hospitals were equipped with a wall-mounted camera, speakers, a large-screen video monitor, and tablet computers for bedside use. The virtual nurse and patient interacted through this technology.

The VIC model is designed to ensure patient safety.[2] For example, by being offsite, the virtual nurse is less likely to be interrupted. In a prospective controlled trial of a simulated care environment, nurses who were interrupted 12 times made twice as many clinical errors as nurses interrupted three times.[3] This finding is consistent with other studies on the impact of interruption on medical error. Active partnership with patients and families in care is associated with greater patient safety. The virtual nurse collaborates with a patient and their family members on healthcare decisions, and can fill in family members on care planning and updates from physician rounding, with the patient's consent.[2] Gaps in care coordination among the multiple healthcare providers a patient sees are associated with preventable adverse events for vulnerable patients like older adults. The virtual nurse's role in admissions and discharge planning could help prevent such gaps.[1,2]

Virtual Nursing and the Nursing Workforce

The National Academies of Sciences, Engineering, and Medicine (NASEM) forecasted the future of nursing , and noted the potential of nursing shortages that may impact patient safety. NASEM reported that overall population growth and increases in the population of older adults are likely to increase demand for nurses, and regions that already have fewer nurses, such as rural areas, are likely to continue to experience shortages into the future. Examining data on registered nurse (RN) workforce losses in 2021, researchers found that younger RNs (i.e., those younger than 35) have high rates of leaving nursing. This exodus likely has long-term impacts to the workforce because these nurses would not be in the profession to help care for our growing population.[4] The virtual nursing model may ameliorate these staffing shortages.[5] Because the experienced nurse operating virtually can mentor licensed practical nurses (LPNs) or other less experienced staff, and depending on state law, those staff members may be able to complete nursing tasks they couldn't achieve independently, with virtual nurse support. For older nurses who may have health challenges that make the physical demands of working on a hospital unit difficult, working as a virtual nurse may enable them to prolong their career and continue to provide high-quality nursing and mentoring.[6] The NASEM report notes that the nursing workforce has proven resilient, largely keeping pace with workforce demand except for shortages in some rural hospitals. Notably, prior to the COVID-19 pandemic, telehealth was deployed in rural settings. For example, a telehealth initiative was established to improve access to telehealth for high-risk pregnancy services in rural Alabama. The virtual nursing model may further innovate rural telehealth and help overcome staffing challenges faced by rural healthcare settings.

Overcoming Barriers to Virtual Nursing

Providing healthcare through telehealth has faced barriers to implementation. Given the unique setting of the virtual nurse compared with traditional nursing and the virtual nurse's specialized role in team-based care and staff mentoring, virtual nurses will have to be experienced and must have especially strong communication skills. These unique attributes can be difficult to find in areas with nursing shortages.[7] In addition, the technological element of virtual nursing will require technical skills on the part of the virtual nurse and investment in technology by health systems. Those costs may be mitigated by the workforce advantages described previously and by consumer demand for the greater convenience associated with telehealth.

Indeed, during the COVID-19 pandemic, patients became familiar with using telehealth. Health systems gained experience in implementing it and overcame barriers. After analyzing COVID-19 telehealth implementation through a human factors approach, researchers have suggested that telehealth outcomes may be determined at a range of levels and may be optimized through strategic implementation. Accounting for personal factors like an individual clinician's ability to use technology can ensure that patients experience telehealth as an enhancement to their care. This research also suggests that at the organizational level, telehealth should be integrated into workflows. Implementation of the VIC model demonstrates some of these barriers and shows how they were overcome. The study authors noted that some physicians initially questioned the value of moving experienced nurses off the floor to the remote command center, and patients' lack of knowledge of what a virtual nurse could do required additional staff communication, patient education, and pamphlets. Those efforts overcame these person-level challenges; the VIC model reported high patient and physician satisfaction.[1]

Virtual Nursing Outcomes on Healthcare Quality and Cost

Over the course of two and half years, the VIC model was assessed for outcomes related to patient satisfaction, quality metrics, financial metrics, safety, and other measures.[1] Researchers found that Top Box scores in the quarterly Hospital Consumer Assessment of Healthcare Providers and Systems report cards improved after the implementation of the VIC model. Scores rating healthcare communications improved from 6.2% to 17.4% depending on the measure.[1] Quality measures from the National Database of Nursing Quality Indicators showed low incidence of catheter-associated urinary tract infections, pressure injuries, deep vein thrombosis, and central-line associated blood stream infection.[1] In terms of patient safety, the VIC model was associated with about 1,400 good catches, or avoided errors, during each quarter. The VIC model was studied to assess whether the rate of missed nursing care differed prior to and after implementation, based on surveys. Researchers could not find a statistically detectable difference, perhaps because of the Hawthorne effect, when individuals being studied alter their behavior because they are being studied. Virtual nurses would bring up missed care, which may have increased the perception that missed care was prevalent when it may have been decreasing.

The Future of Virtual Nursing

The COVID-19 pandemic accelerated the evolution of telehealth technologies and the willingness to apply telehealth to additional contexts, such as remote patient monitoring, which involves collecting patient data through telehealth to impact care decisions. The virtual nursing model is more complex than remote patient monitoring. Like remote patient monitoring, however, it may support higher-quality care outside of its original setting, as long as future implementation accounts for human factors variables that determine usability, such as meeting patient needs and selectively adapting elements of patient care that work well with communication technologies. As the need for skilled nurses increases, the virtual nursing model may enable virtual nurses to contribute to patient safety both in direct care as well as through staff mentoring and collaboration.

Authors

Kathleen Sanford DBA, RN, FAAN, FACHE
Executive Vice President, Chief Nursing Officer
CommonSpirit Health
Englewood, CO

Sue Schuelke PhD, RN-BC, CNE, CCRN-K
Assistant Professor
University of Nebraska College of Nursing
Lincoln, NE

Merton Lee, PharmD, PhD
Researcher
American Institutes for Research (AIR)
Columbia, MD

Sarah E. Mossburg, RN, PhD
Senior Researcher
American Institutes for Research (AIR)
Arlington, VA

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