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Telehealth Simulation and Education Impact on Student Knowledge

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Abstract

Background: One of the most recent improvements to the everchanging healthcare is telehealth. Telehealth is used by about 70% of healthcare providers across the United States. It is used to reach patient populations such as those in rural locations or with limited resources. Telehealth can improve patient outcomes and encourage quality patient care. However, many nursing schools include programs to educate students on the utilization of telehealth. **Purpose:** In undergraduate and graduate nursing school, do telehealth simulations and education improve student knowledge? **Methods:** A review of literature was completed using the databases: EBSCOhost, PubMed, and CINAHL. Key words searched included "nursing student, telehealth or telemedicine, knowledge, education." Articles selected were written between the years of 2018 and 2022. **Results:** Telehealth education can greatly improve student knowledge and comfortability regarding telehealth. Many means of education can be incorporated into the curriculum but those that included a telehealth simulation led to positive student outcomes. **Implications for Nursing Practice:** Higher educational facilities for nursing students should incorporate telehealth education into their scheduled curriculum. This can lead to greater comfortability regarding telehealth. This will allow future nurses to easily adapt within the everchanging healthcare environment.

Student Knowledge Regarding Telehealth

Health care is ever changing and improving. One of the most recent improvements to health care is known as telehealth. According to the Human Resources and Services Administration (HRSA, 2022) telehealth is defined as "the use of electronic information and telecommunication technologies to support long-distance clinical health care, patient and professional health-related education, health administration, and public health" (para. 1). According to Villegas (2021), telehealth is being used far more frequently since the COVID pandemic has begun, about 50-150 times the number of patients seen virtually. Telehealth can be seen in a variety of health care environments and is implemented through many different forms, this can include video and telephone synchronous interactions, asynchronous store and forward (data collected from one hospital that is forwarded to another), remote monitoring, and mHealth (Chike-Harris et al., 2021).

Synchronous telehealth is live monitoring and conversation with a healthcare provider, nurse, or other member of the healthcare team. This may be performed over a videocall or telephone. If there is video monitoring available, aspects of live assessments, including listening to heart and lung, or looking in eyes and ears may be included (Taylor & Fuller, 2021). When conducting a synchronous appointment, a nurse at one facility will be the eyes and the ears of the provider. The nurse will utilize the tools included and perform the assessment as dictated by the provider. Therefore, proper education is necessary for both the nurse and the provider (Chike-Harris et al., 2020). The asynchronous method, store and forward, occurs when specific information about health such as labs, x-rays, CT scans, or images are obtained by one location and then sent to another facility to be analyzed and included in the health chart (Taylor & Fuller, 2021). Remote monitoring can be used with patients that have frequent rehospitalizations or

multiple appointments, such as those with chronic conditions (George et al., 2021). One example of this includes diabetic monitoring of blood sugars. Remote monitoring can watch for trends and can alert patients when their sugar is too low or too high (American Medical Association, 2022). mHealth is the latest use of telehealth. By linking health to mobile phones, patients can communicate with their providers and receive education to encourage personal health (Taylor & Fuller, 2021). mHealth can also be used to allow providers to communicate with one another. Due to the influences lack of resources and availability have on patient care, this can be highly beneficial. By allowing provider to provider interactions, communication of ideas can be exchanged in a manner that improves patient outcomes and promotes health (Taylor & Fuller, 2021).

Telehealth can greatly improve outcomes of patients in rural and underserved locations (Cassiday et al., 2020). In rural settings, telehealth involves patients seeking care from providers without needing to leave their homes. As a result, populations with limited resources in rural locations can be served with adequate healthcare opportunities that can be found in urban locations. These underserved and rural locations could greatly benefit from the use of telehealth in both inpatient and outpatient care (Chike-Harris, 2020). Telehealth can serve populations by saving costs of travel which reduce the time away from home and work. By allowing parents to connect with providers from home, this decreases the need of childcare for parents (Taylor & Fuller, 2021). In urban locations, public transportation is common and utilized by many people. If this piece is missing, many people may be homebound or reliant on family and friends to get to their appointments. Telehealth can overcome the barrier of socioeconomic costs by reducing unnecessary resources and time, which will allow healthcare will serve a higher population at a lower cost due to the resources and time saved (Villegas et al., 2021). This can further benefit

patients by improving their quality of healthcare and then improving healthcare systems (Taylor & Fuller, 2021).

Additional benefits include remote monitoring of patients, especially with those with heart conditions (George et al., 2021). Taylor and Fuller (2021) share how telehealth remote monitoring can lead to lower rehospitalization rates and prevent patients from seeking care in emergency rooms. This shows that remote monitoring is a safer alternative when sending patients home with questionable diagnoses. Oftentimes, patients are unclear when they should seek medical treatment or return to the hospital leading to delayed diagnosis and treatments (Taylor & Fuller, 2021). Telehealth can be used for assessment of diseases, consultation with providers or other healthcare staff, and evaluation both in an inpatient and outpatient setting (George et al., 2021).

While telehealth seems to be innovative and versatile, several issues may arise. Telehealth practice concerns include lack of internet access, technology issues or malfunctions, confidentiality concerns, and nursing practice concerns (Taylor & Fuller, 2021). Oftentimes, the underserved rural health locations have limited access or poor-quality internet; as a result, telehealth may become frustrating for patients due to connectivity issues or little service (Taylor & Fuller, 2021). Furthermore, the private internet services that are needed to protect appointments can be under high demand and lead to poor connectivity issues (Taylor & Fuller, 2021). These issues prevent telehealth from working smoothly and can be frustrating for both patients and providers. Additionally sharing health information over the internet can place patients at risk, therefore encryption must be used but patients are still at risk (Taylor & Fuller, 2021).

Healthcare providers and nurses must be sure that the patient understands the structure of the appointment. Telehealth must follow the guidelines as issued by the Health Insurance Portability and Accountability Act (HIPAA) (Taylor & Fuller, 2021). Nurses should address the patient's concerns and explain the risks, appointment agenda, as well as instructions in case the connection were to be lost due to the patient risk when entering a telehealth appointment (Taylor & Fuller, 2021).

Practice laws should be addressed to nurses during their education on telehealth (Taylor & Fuller, 2021). Nurses must be sure that they are practicing in states that their license is appropriate in, otherwise they are not permitted to practice. This includes practicing through telehealth (Taylor & Fuller, 2021). Some other limitations to adequate health care can include lack of transportation, limited resources, and lack of providers (Taylor & Fuller, 2021). However, one of the greatest limitations to telehealth is a lack of standardized programs and guidelines in higher education (Cassiday & Mott, 2020).

Currently, it is estimated that over 70% of healthcare providers within the United States are utilizing telehealth to serve their patient population; however, few schools implement telehealth education into their curriculum (Cassiday & Mott, 2020). It is estimated that telehealth will continue after COVID restrictions have been lifted (Chike-Harris et al., 2021). About 30-40% of patient visits will be conducted through telehealth following the COVID pandemic (Chike-Harris et al., 2021). Due to the increased use of nurses need to be well versed with the use of telehealth in practice. Cassiday (2020) further goes on to say: "With this increase in demand/need for patient care and the shortage of healthcare professionals, telehealth services have increased and are needed amongst patients; therefore, the need for telehealth education and training is crucial for future providers success in providing this service to patients" (p. 228). This

education is critical within the nursing profession, and as a result, proper education should begin at the level of the undergraduate nursing student. Education should not simply stop at graduation. For those already in the healthcare field, simulations and modules should be encouraged for practicing Registered Nurses, Licensed Practical Nurses, and Nursing Practitioners (Cassiday et al., 2020).

Students are expected to be able to enter the field with proper education regarding telehealth due to the high presence of patient interactions done virtually. This education should begin in nursing school, however, there may be a lack of experience among the educators expected to teach these students (Emerson et al., 2021). Taylor and Fuller (2021) explain bluntly, "nursing education programs continued a slow pace of integrating telehealth in their programs… attributed this slow progress to the lack of nurse educator preparation" (p. 5). Educators have not received enough education themselves to conduct these programs; furthermore, many schools lack the resources or program knowledge to guide the students' knowledge (Taylor & Fuller, 2021). Thankfully, programs to educate students on telehealth can be simply incorporated into the preexisting curriculum through lectures, presentations, online modules, and many simulations (Chike-Harris, 2021).

The American Association of Medical Colleges has identified six domains that should guide telehealth education: patient safety and appropriate use of telehealth, access and equity in telehealth, communication via telehealth, data collection and assessment via telehealth, technology for telehealth, and ethical practices and legal requirements for telehealth (AAMC, 2022). These guidelines should be used to lead higher education facilities to incorporate telehealth education into their curricula. Many of these domains can be included in standardized nursing education that is already taught such as health policy and law (Taylor & Fuller, 2021).

Didactic telehealth knowledge should be used parallel to simulation. Education regarding policy, law, communication, privacy, and advocacy are all important nursing skills that can be taught with the classroom education nursing students already receive (Taylor & Fuller, 2021).

One of the most common methods to increase student knowledge of telehealth is implementing simulations. “Telehealth simulation has shown to be acceptable and helpful in teaching clinical reasoning among nursing students. Incorporating telehealth simulations early on in nursing curriculums would allow students to have an increased exposure to telehealth experiences, increase student engagement and learning, and help students prepare for real interaction experiences with patients” (Villegas et al., 2021, p. 2). Telehealth simulations can also greatly improve student’s confidence, grant the opportunity to show the nursing skills that have been learned, and apply their knowledge (Taylor & Fuller., 2021). Simulations can also be used when in-person classes are not appropriate, such as during the COVID pandemic (Bradford et al., 2021). Bradford (2021) and her team talk highly of telehealth simulations. They state: “simulated clinical experiences are an evidence-based method for enhancing acquisition of clinical skills, clear communication styles, and critical decision-making. Simulation learning can assist students in meeting core competencies and transitioning to their professional role while growing clinical confidence” (p. 366). This shows that telehealth simulations should be implemented in nursing programs across the United States due to the high popularity within healthcare. Simulations can also force students to face difficult situations and drive them to react appropriately considering patient safety, such as identifying a patient at risk for self-harm (Whited et al., 2021).

Telehealth can also be used to facilitate interprofessional collaboration safely. While learning about tools such as SBAR (situation, background, assessment, and recommendation), is

important, telehealth education such as simulations can be used to encourage students to work with other members of the healthcare team (Wesemann et al., 2021). In one study, undergraduate nursing students collaborated with a family nurse practitioner (FNP) and together came up with a care plan (Wesemann et al., 2021). Telehealth simulations are a safe space for students to work with one another without harm that could come to the patient (Whited et al., 2021).

Overall, telehealth has numerous benefits and nurses need to be competent to safely provide care. Education should begin within school and students should have exposure to telehealth through simulations and didactic teaching (Emerson et al., 2020).

Purpose

This paper will answer the following question: In undergraduate and graduate nursing school, do telehealth simulations and education improve student knowledge?

Methods

A review of literature was conducted on research examining how prevalent telehealth curriculum is within schools, how telehealth is taught within nursing schools, and how simulations and modules increase student knowledge and comfortability. This research considered qualitative and quantitative articles that examined types of telehealth education within schools and the impacts it had to student knowledge and confidence. A comprehensive search was conducted with numerous databases including EBSCOhost (Elton B. Stephens Company), PubMed, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). Key words searched included “nursing student, telehealth or telemedicine, knowledge, education.” Articles selected were written between the years of 2018 and 2022. The EBSCOhost search yielded 66 articles, Pubmed yielded 22 articles, and CINAHL yielded 26 articles. After

applying exclusion criteria, eight articles were chosen from EBSCOhost. The other databases had overlapping articles; therefore, none were selected. Four other articles were included within the introduction. Inclusion criteria included articles written within the last five years, human trials, and levels one through six on the Hierarchy Levels of Evidence of Literature (Melnyk & Fineout Overholt, 2011). Exclusion criteria included articles that were outside of the five-year time as well as those that were not conducted within the United States.

Results

The results section is broken down into subcategories which discuss the following: characteristics of curriculum, student knowledge following education, and student feedback during debrief. This provides information to demonstrate how telehealth education impacts student knowledge and comfortability following appropriate curriculum.

Characteristics of Curriculum

Many different types of curriculum and combinations were used to educate students regarding telehealth. These methods were impacted by resources and availability of preceptors (Wesemann et al., 2021). The databases were examined to show that multiple teaching methods should be utilized to have a greatest impact on student knowledge of telehealth (Chike-Harris et al., 2021). Therefore, it is important to ensure that students have different exposure to telehealth to have the highest influence on their knowledge.

It is important to mention that many nursing curricula are already fast paced considering the vast knowledge that nursing students are expected to know; consequently, telehealth education should be incorporated into the already existing curriculum and included throughout multiple semesters of the preexisting nursing program (Chike-Harris, 2021). This can be done by

including virtual healthcare privacy laws with the already existing healthcare policies class, or by including virtual communication etiquette when class already covers appropriate nursing communication (Chike-Harris, 2021). Additionally, online portions with assignments or virtual quizzes can be further incorporated into the curricula to encourage baseline knowledge (Chike-Harris, 2021). Pre-briefing and introducing students to the simulation can also be an opportunity for education, by explaining how the expected client visit will go, students can undergo a virtual orientation and have a review of their skills such as SBAR and their roles (Whited et al., 2021). Presentations regarding the prevalence of telehealth and how it is used in practice can also be eye-opening to nursing students and improve their understanding (List et al., 2019).

While knowledge of communication etiquette and modules of law and policy are important, the ways in which they can show their skills and receive feedback will ultimately be more impactful. This can be done using simulation. Simulation can be used with a pre-designed patient with a thorough health history, guidelines for focused assessments, and a clear patient problem that represents a patient population (Wesemann et al., 2021). These telehealth simulations can be used to show real world applications of nursing skills as well as opportunities for health education and exposure (Villegas et al., 2021). Many of the simulations were simply used to highlight the nursing method, such as addressing the chief complaint though assessment, identifying the nursing diagnosis, and implementing a plan of care, followed by appropriate documentation (Cassiday et al., 2020). Some simulations were used with free videoconferencing (George et al., 2021), while others used their faculty members to act as the patient to create a more realistic and accurate flowing visit (Emerson et al., 2021).

These simulations can also allow for collaboration between nursing students and other members of the healthcare team such as nurse practitioners, this can allow students to learn

communications skills and feel empowered to make recommendations regarding patient care (George et al., 2021; Wesemann et al., 2021). Another specific example, telehealth simulations can be implemented to expose students to complicated mental health conversations. In this study, one simulation was done to encourage students to have difficult conversations regarding mental health. This gave students the opportunity to pick up on the warning signs that a teenager was harming herself (Whited et al., 2021). This allowed for students to safely deal with this situation in a manner that does not put anyone in danger. Simply saying difficult and personal questions aloud can help students in the future (Whited et al., 2021). Another specific simulation example was education regarding breastfeeding. This simulation was used to show students they can provide proper health teaching and assist patients that are in underserved and rural locations. For example, a new mother should not have to drive a few hours for an appointment when teaching methods regarding breast feeding can be conducted virtually (Villegas et al., 2021). This also showed students that they can assist the patient population without needing to be present, teaching can be done over video and assessments can be done virtually when needed.

Emerson (2020) had a unique approach in her study when she approached telehealth. She incorporated mock interviewing between her online modules and the simulation piece. Students were able to interview each other after learning the case scenario and they were able to act the role of the patient and take turns as the nurse doing the assessment and interview (Emerson et al., 2020). This led to more comfortability when performing the telehealth simulation since they had already spoken with one other and had done mock interviews prior. This approach was well liked by the students as they had an increase in knowledge by learning more about the diagnosis as well as the interactions with one another (Emerson et al., 2020).

Student Knowledge Following Education

Student knowledge increased following simulation and education through modules, lectures, and/or presentations. Students felt more prepared and more comfortable with telehealth following the exposure and training they underwent. After using a Level IV descriptive/explanatory study of nurse practitioner students, 83% of students acknowledged they learned something new and felt that the simulation was realistic and would recommend further including this simulation in the future (Wesemann et al., 2021). This shows the increased knowledge the student's felt after the simulation is complete.

Chike-Harris (2020) used a level III quasi-experimental study by using the pretest and posttest method. This showed a great increase of student knowledge following the narrative lectures that were used. In the lecture "Informatics in Health Care Delivery" which demonstrated a thorough teaching of telehealth, application, equipment, and information regarding technology use. There was an increase from 72% in pretest scores to 92% posttest scores. Additionally, the lecture "Advanced Health Law and Policy", which covered topics such as telehealth specific laws and policies, showed an increase from 62% pretest scores to 87% posttest scores. This shows that these students learned from the lectures regarding telehealth informatics and policy, which also included knowledge that is not specific to telehealth and can be applied to everyday nursing practice (Chike-Harris, 2020).

Another simple example of telehealth education is a presentation of how telehealth is utilized in practice and the nurse's role (List et al., 2019). List (2019) aimed to evaluate the difference a small change in class lecture can impact student knowledge. Incorporating the pretest posttest method, a four-point Likert scale was used for the following prompts: "I can define telehealth," "I can identify how telehealth may improve patient outcomes," "I can cite examples of telehealth in nursing education," "I can use telehealth education in FNP practice

environments" (List et al., 2019). The overall mean confidence before the lecture was 2.82 and following the lecture the mean confidence rose to 3.97 (List et al., 2019). Consequently, students felt more confident with their knowledge of telehealth and felt as though they can use this knowledge in practice. From this study it is important to note that education does not need to be a grand intervention, it can be as simple as a one-time presentation to make a difference in education (List et al., 2019).

Cassiday (2020) performed a six-item pretest and posttest examination. The students were asked to rate their answer on scale of one through five using the Likert scale. The first question is as follows, "please tell me how useful you found this simulation to be in your future practice as a FNP" this question had a mean of 4.9 on the Likert scale. In the second question: "please tell me in your opinion if we should continue this simulation for future cohorts," there was mean of 4.8 (Cassiday et al., 2020). This shows that students felt as though they had takeaways for their future practice and would encourage the use of this simulation in the future due to the education retained. Many students that were cynical of the telehealth simulation going in, talked highly of the simulation upon completion. In other similar simulations, students felt less feelings of nervousness and increased comfortability and confidence (George et al., 2021). Furthermore, undergraduate students reported an increase in comfortability and excitement when working with nurse practitioner students during their experience (George et al., 2021).

One study evaluated whether students felt as though they would use telehealth in practice, 94.7% of students reported that they would use telehealth in practice following the simulation (Villegas et al., 2021). From the same study, 96.6% found the simulation helpful and 79% would like to see more simulations like that in the future (Villegas et al., 2021). Prior to their participation most of the students reported that they had little to no experience with telehealth,

this shows a significant improvement in knowledge and understanding of the utilization of telehealth in practice (Villegas et al., 2021).

Many studies utilized the pretest and posttest design and showed an increase in knowledge following the simulation. Students were asked to rate their skills before and after the simulation using an 11 question survey using the Likert scale (one through five). Following the simulation, the posttest showed a 95% of students agreed or strongly agreed with all of the 11 items, examples of the items included in the survey were "confidence in knowledge application, decision making, reasoning, and communication skills" (Whited et al., 2021). This shows an increase in student knowledge and a growth in confidence among the students. Emerson (2020) also followed the 11 question Likert survey for the study and found the mean scores from the first simulation showed a range of 4.75-5 and following the second simulation the range of scores from the survey were 3.86-4.57. This also showed an increase in comfortability and increased knowledge with nursing skills and interviewing skills.

Student Feedback During Debrief

It is important to have a proper debrief following simulations, or evaluations to be completed after presentations or online modules. With the debrief following simulation, the most common method used was open ended questions that facilitated conversation. Two common themes were identified following the Zoom telehealth simulation: the need to improve telehealth skills, and the importance of interprofessional collaboration (Wesemann et al., 2021). Students quickly realized how different telehealth is compared to the standard in patient visit (Wesemann et al., 2021). This showed them how they must use communication and rely on their other nursing skills to assess and diagnose (Wesemann et al., 2021). Many students also found the collaboration to be "engaging" and felt they had more creative ideas and allowed the students to

provide the greatest care for the patients (Cassiday et al., 2020). Students were encouraged to use proper communication between one another and had to appropriately share information, such as nurse practitioners talking with their undergraduate nursing student counterparts, if they cannot communicate in a language both can understand, students cannot collaborate (George et al., 2021). This led them to be able to properly assess differences in knowledge, but communication can still work between roles (George et al., 2021).

The simulation also led for students to realize their room for improvement, many students were able to realize the gaps they in knowledge and the skills they need to improve (Whited et al., 2021). The students that participated in the pediatric psychiatric simulation realized afterwards the importance of asking to speak with the teenager alone with the parent outside the room to evaluate mental health to promote integrity (Whited et al., 2021). Many students coming into the simulation were nervous and not confident with their telehealth and nursing skills; however, following the simulation students reported increased knowledge and comfort of their skills and would welcome future opportunities to practice these skills (George et al., 2021). Many students were not aware of the variety of telehealth use and how prevalent it is within the healthcare field due to the lack of teaching within schools (Villegas et al., 2021). That is why it is recommended that schools incorporate telehealth education within their curriculum (List et al., 2019).

Students recommended smaller simulation group sizes for greater participation (Chike-Harris, 2020). Many felt as though they could not actively participate when the group size was too large, in this study the group size was six students (Chike-Harris, 2020). They would recommend smaller groups to have more interaction with the patient and one another (Chike-Harris, 2020). However, in this same study students spoke positively about the overall simulation

experience, especially the live feedback from their advisors on their skills and communication (Chike-Harris, 2020).

Only one study included motivational interviewing prior to the simulation experience; the students spoke highly of this piece and would like to see more experiences in the future (Emerson et al., 2021). This was unique to this study, however it led to greater comprehension and competency during the telehealth simulation (Emerson et al., 2021). Students felt as though they learned through the role playing and were able to identify stressors and symptoms of the symptoms they were expected to help diagnose and assess (Emerson et al., 2021).

Students spoke highly of the structured debrief with open ended questions following the simulation as well (Emerson et al., 2021). Many explained how it allowed them to hear how others worked through the patient's stressors and showed them how they could think differently when approaching patient care (Emerson et al., 2021). Opposingly, other students talked highly of the individualized debriefing with one of their preceptors. These students felt they could be more honest and welcomed the individualized feedback (George et al., 2021).

Discussion

The purpose of this literature review was to answer the following question: In undergraduate and graduate nursing school, do telehealth simulations and education improve student knowledge? There is sufficient evidence to support that telehealth simulations and education improve student knowledge (Chike-Harris, 2020). Furthermore, students experienced more confidence in their nursing skills, comfortability with technology and collaboration, and ability to conduct a virtual assessment following the telehealth modules and simulation (Wesemann et al., 2021).

After analyzing the results, it can be determined that telehealth education can greatly increase student knowledge. Telehealth education should be incorporated in nursing programs across the United States due to the increased prevalence of patient care conducted virtually (Chike-Harris, 2021). Telehealth can be conducted to reach patient populations with limited resources, poor socioeconomic status, and those that are far from specialty such as psychiatry or women's health (Emerson et al., 2020). Benefits of telehealth include reducing cost of healthcare, saving time, and decrease in hospitalization, and improved health outcomes (Emerson et al., 2020). Telehealth impacts a high proportion of citizens within the United States and is continually on the rise (Villegas et al., 2021). It is estimated that over 70% of healthcare providers within the United States are utilizing telehealth currently to reach their patient population (Cassiday et al., 2020). Considering this, higher education should have formal guidelines for telehealth education that should be required within schools (Chike-Harris et al., 2021). We can clearly see how telehealth education can improve student confidence and encourage students to utilize and promote telehealth in their professional practice (Cassiday et al., 2020).

If education does not change students will continue to be unprepared to enter the nursing field for this specific but important practice (Chike-Harris et al., 2021). Furthermore, students are nervous and not confident in this practice, and this can be changed with minimal curriculum changes (List et al., 2019). Research has shown that simple changes in the curriculum can make a difference in perceptions and understanding of telehealth applications (List et al., 2019). However, for student knowledge to be greatly impacted and for students to gain comfortability and confidence, telehealth education should be implemented throughout multiple semesters of the nursing curriculum (Emerson et al., 2021). To go the next step, education should also take a

multimodal approach and include aspects of didactic education, motivational interviewing, and simulations, followed by constructive debriefing (Chike-Harris, 2020).

Some limitations to this study include small sample sizes and inadequate number of faculty members (Chike-Harris, 2020; Emerson et al., 2020; List et al., 2019; Wesemann et al., 2021; Whited et al., 2021). Lack of control group (Chike-Harris, 2020; Emerson et al., 2020; List et al., 2019; Wesemann et al., 2021). Lack of proper training with technology or technological difficulties (Cassiday et al., 2020; Villegas et al., 2021).

Recommendations for practice include developing a standardized telehealth teaching method, incorporating telehealth education and simulations into nursing school curricula. Faculty should also be sure to encourage proper debriefing and share informational feedback. Faculty should also be educated within the telehealth domain to promote proper education and skills students. Technological difficulties should also be taken care of before education and simulations begin to promote smooth teaching that appears realistic. If schools cannot afford to or are incapable of running simulations, online modules, lectures, presentations, or motivational interviewing should be used.

References

Bradford, H., Farley, C., Escobar, M., Heitzler, E., Tringali, T., Walker, K. (2021). Rapid curricular innovations during COVID-19 clinical suspension: maintaining student engagement with simulation experieinces. *Journal of Midwifery & Women's Health, 66*, 366-371. doi:10.1111/jmwh.13246

Cassiday, O., Nickasch, B., Mott, J. (2020). Exploring telehealth in the graduate curriculum. *Wiley Periodicals, 56*, 228-232. DOI: 10.1111/nuf.12524

Chike-Harris, K. (2021). Telehealth education of nurse practitioner students. *The Journal for Nurse Practitioners, 17*, 310-316. https://doi.org/10.1016/j.nurpra.2020.12.029

Chike-Harris, K., Garber, K., Derouin, A. (2021). Telehealth educational resources for graduate nurse faculty. *Nurse Educator, 46*(5), 295-299. doi: 10.1097/NNE.0000000000001055

Chike-Harris, K., LaManna, J., Eckhoff, D., Buchanan, L., McCumber, S., Corcoran, K., Shea, J., Rutledge, C. (2021). The missing link: the iSOAP model for incorporating telehealth within simulations. *International Nursing Association for Clinical Simulation and Learning, 59*, 39-51. https://doi.org/10.1016/j.ecns.2021.05.006

Emerson, M., Buchanan, L., Golden, A. (2020). Telehealth simulation with graduate nurse practitioner students. *Nurse Educator, 46*(2), 126-126. doi: 10.1097/NNE.0000000000000843

George, T., Munn, A., Phillips, T., Hucks, M. (2020). The impact of telehealth objective structured clinical evaluations in intraprofessional nursing education: a mixed methods study. *Nurse Education Today, 103*(2021). https://doi.org/10.1016/j.nedt.2021.104978

List, B., Saxon, R., Lehman, D., Frank, C., Toole, K. (2019). Improving telehealth knowledge in nurse practitioner training for rural and underserved populations. *Journal of Nursing Education, 58*(1), 57-60. doi:10.3928/01484834-20190103-10

Melnyk, B.M. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing and healthcare: A guide to best practice*. Philadelphia: Lippincott, Williams & Wilkins. https://d2l.sdbor.edu/d2l/le/content/738294/viewContent/3777381/View

Taylor, J. & Fuller, B. (2021). The expanding role of telehealth in nursing: considerations for nursing education. *International Journal of Nursing Education Scholarship, 18*(1). https://doi.org/10.1515/ijnes-2021-0037

Telehealth competencies. AAMC. (n.d.). Retrieved February 14, 2022, from https://www.aamc.org/data-reports/report/telehealth-competencies

Telehealth scenario: Remote Patient Monitoring (RPM) for diabetes management. American Medical Association. (n.d.). Retrieved February 14, 2022, from https://www.ama-assn.org/practice-management/digital/telehealth-scenario-remote-patient-monitoring-rpm-diabetes-management

Villegas, N., Cianelli, R., Cerisier, K., Fernandez-Pineda, M., Jacobson, F., Lin, H., Sanchez, H., Davenport, E., Zavislak, K. (2021). Development and evaluation of a telehealth-based simulation to improve breastfeeding education and skills among nursing students. *Nurse Education in Practice, 57*, 1-6. https://doi.org/10.1016/j.nepr.2021.103226

Wesemann, D., Posey, K., Wilson. (2021). Clinical simulation to evaluate students' interprofessional telehealth skills between multiple university campuses. *International*

Nursing Association for Clinical Simulation and Learning, 54, 35-39. https://doi.org/10.1016/j.ecns.2021.01.011

What is telehealth? U.S. Health Resources & Services Administration. (2021, September 30). Retrieved February 14, 2022, from https://www.hrsa.gov/rural-health/telehealth/what-is-telehealth

Whited, T., Stickley, K., de Gravelles, P., Steele, T., English, B. (2021). Using telehealth to enhance pediatric psychiatric clinical simulation: rising to meet the COVID-19 challenge. *Online Learning Journal, 25*(1).

Citation	Research design and level of evidence in order from highest to lowest	Sample and population description	Data collection methods	Results of study
Whited, T., Stickley, K., de Gravelles, P., Steele, T., English, B. (2021). Using telehealth to enhance pediatric psychiatric clinical simulation: rising to meet the COVID-19 challenge. *Online Learning Journal, 25*(1).	Level III – quasi-experimental, included a Level VI qualitative component	60 nursing students from the College of Nursing of the University of Arkansas for Medical Sciences	Students participated in a telehealth simulation after lessons on pediatric psychiatric nursing, they completed pre tests and then posttests after the simulation, additionally there was open ended questions as well as debriefing to follow	Five themes emerged from the qualitative data: communication, scenario, emotions, content, and modality. Students acknowledged that the simulation prepared them to interview an adolescent privately to ensure integrity of an assessment. Results of the PSLA assessment, which asked the students to rate their perceptions on learning and self-confidence performing the skills, showed more than 95% agreed or

				strongly agreed with all 11 items. Post test improvement showed 70% to 77%.
Chike-Harris, K. (2021). Telehealth education of nurse practitioner students. *The Journal for Nurse Practitioners, 17*, 310-316. https://doi.org/10.1016/j.nurpra.2020.12.029	Level III – quasi-experimental, pretest-posttest	273 students from the CON at the Medical University of South Carolina	Pretest-posttest design with the tests assessing the students' change of knowledge regarding the content of the lectures, and included student open ended surveys, and evaluative the quality of discussion question responses	There was a positive increase in student knowledge in the various categories that were evaluate, this included Informatics of Health Care Delivery (28% increase), ACMII (32% increase), Advanced Health Care Policy and Advocacy (40% increase), and Role Practicum (80% increase), students found the ACAR course to be the most positive and the experimental activity that had the most negative

				response was the ACMII mock telehealth visit
George, T., Munn, A., Phillips, T., Hucks, M. (2020). The impact of telehealth objective structured clinical evaluations in intraprofessional nursing education: a mixed methods study. *Nurse Education Today, 103*(2021). https://doi.org/10.1016/j.nedt.2021.104978	Level III – quasi-experimental, mixed methods	This study included 28 NP students and 4 undergraduate students. Half the participants were between the ages of 18-35 and the other half were between 35-55. With 29 students female and 3 male students. The study was conducted at a public, liberal arts university in a rural area of the Southeast US.	The students were given access to a pre and performed the simulation. The undergraduate students played the role of the telehealth nurse and telepresenter and was responsible for introducing the standardized patient, relaying VS, and assisting with the physical examination. The NP students were responsible of being the student nurse practitioner and was expected to obtain an adequate	The survey was a 15 item survey and was scored using the 5 point Likert scale, five open ended questions were also administered to allow students an opportunity to further express their perceptions. Increased student response scores were noted in all categories. Pre survey range (3-4) post survey range 4.0. undergraduate students gave overwhelming positive responses while graduate students approached with more hesitancy but reported increased

			patient history specific to the chief complaint. The data was analyzed using statistical packaging software version 27.	familiarity with logistics, equipment, and communication.
Wesemann, D., Posey, K., Wilson. (2021). Clinical simulation to evaluate students' interprofessional telehealth skills between multiple university campuses. *International Nursing Association for Clinical Simulation and Learning, 54*, 35-39. https://doi.org/10.1016/j.ecns.2021.01.011	Level IV – descriptive, explanatory	6 nurse practitioner students, 5 of which were from a DNP program and the 6th was from a Post Graduate Certificate Program	Students completed a telehealth simulation and then responder with verbal feedback followed by a survey and self-reflection	The results of the study showed that all students learned something from the experience, 83% acknowledged that they learned something new about the NP scope of practice. Two themes emerged from the conversations: they have a need to improve their telehealth skills, and the importance of interprofessional collaboration
Villegas, N., Cianelli, R., Cerisier, K., Fernandez-Pineda, M., Jacobson, F., Lin, H., Sanchez, H., Davenport,	Level IV – cross sectional	205 BSN students enrolled in	Students were given access to	There was a total of six questions

E., Zavislak, K. (2021). Development and evaluation of a telehealth-based simulation to improve breastfeeding education and skills among nursing students. *Nurse Education in Practice, 57*, 1-6. https://doi.org/10.1016/j.nepr.2021.103226	descriptive study	different semesters in a Women's Health nursing coarse from a high level institution in Miami, FL.	online modules on breast feeding to complete. Then they had to participate in objective structured clinical examinations to demonstrate their skills, following this they participated in the simulation experience which was telehealth over zoom where they were consulting a breastfeeding mother dealing with various issues. Each simulation was 15 minutes long. They were randomly assigned roles and some were observers.	including two open ended questions on the final evaluation. 99.96% of students found the simulation helpful. 94.7% of students felt they could use this knowledge in practice. And most of the students (79%) would like to have more telehealth simulations again in the future. They felt it was a way they could utilize their skills and learned the implications of telehealth.

			After their simulations they were given an evaluation to complete.	
Emerson, M., Buchanan, L., Golden, A. (2020). Telehealth simulation with graduate nurse practitioner students. *Nurse Educator, 46*(2), 126-126. doi: 10.1097/NNE.0000000000000843	Level VI – descriptive	11 FNP students from US (4 NP, 3 psychiatric mental health NP, 1 adult gerontological NP, and 7 family NP)	Students completed training in 3 parts. Part 1 was online training, part 2 was in person role playing and interviewing with fellow students, part 3 was the telehealth simulation.	after the training students were asked to evaluate the materials and activities related to their simulation experience on a scale of 1 (Strongly disagree) to 5 (strongly agree), the mean score ranged from 4.75-5 from the first simulation and 3.86-4.57 from the second simulation. Students also spoke up during their debriefing and explained how they had many takeaways from the experience, especially the motivational interviewing.

				They would like to see more role playing exercises and interviewing in the future. They feel they have gained confidence with their skills during this process.
Cassiday, O., Nickasch, B., Mott, J. (2020). Exploring telehealth in the graduate curriculum. *Wiley Periodicals, 56*, 228-232. DOI: 10.1111/nuf.12524	Level VII – quality improvement	57 graduate nursing students from two different years, 2nd and 3rd year family nurse practitioner students.	Students participated in an online lecture course before a telehealth simulation. They were in groups of 6 students and the simulation took place over 2 hours with six different patients. They completed an anonymous evaluative survey following the simulation. It included both	Data set 1 had a mean of 4.9 and dataset 2 had a mean of 4.8 which signifies the average number on a scale of 1-5 to students rated the questions "Please tell me how useful you found this simulation to be in your future practice as a FNP" and "please tell me in your opinion if we should continue this simulation for future cohorts", following the qualitative

			qualitative question and quantitative question.	analysis of the data, two major themes appeared: engagement and realism
List, B., Saxon, R., Lehman, D., Frank, C., Toole, K. (2019). Improving telehealth knowledge in nurse practitioner training for rural and underserved populations. *Journal of Nursing Education, 58*(1), 57-60. doi:10.3928/01484834-20190103-10	Level VII – quality improvement	24 students complete the pretest but only 22 students completed the post test, only these students were included in the final results, they are students from a school of nursing in the midwestern US. They were FNP students.	Students attended a presentation designed to increase knowledge of telehealth as a tool for delivery of health care services. Student confidence was evaluated with pre and posttest surveys.	The overall mean confidence at baseline prior to the lecture was 2.82 and following the intervention it was 3.97 showing a statistically significant change ($p<.001$) for all survey items.