IMPROVING EDUCATION FOR ADVANCED PRACTICE NURSES: DEVELOPING COMPETENCIES FOR TELEHEALTH

by

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DNP Capstone Project Approval Form

This is to certify that

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successfully defended his/her Capstone project entitled:

Improving Education for Advance Practice Nurses (APNs): Developing Competencies for Telehealth Education

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Abstract

Problem Under Investigation: Advance practice nurses (APNs) are expected to use telehealth to provide care, yet their limited exposure to healthcare technologies throughout their education interferes with the development of this skill.

Objective: Develop culturally sensitive and specific competencies to enhance telehealth education for APN students at the University at Buffalo (UB).

Background Literature/Theoretical Framework: An extensive review of literature reveals a scarcity of graduate programs that include telehealth. Nursing organizations suggest incorporating information technologies into curriculums, however the integration of technology into education has been protracted. Bloom’s Taxonomy of Learning will promote the development of competencies for telehealth education.

Methods: An educational session was held with APN students at UB. Following the educational session, a focus group was conducted to obtain feedback. Thematic extraction enhanced the development of competencies for future APN education.

Results: Participants indicated an interest in telehealth education as long as it did not detract from current therapeutic education. Participants generated suggestions for future telehealth education at UB.

Potential Significance: Competencies were developed for incorporating telehealth into DNP curriculum.

Implications: Further research is needed to determine the best method to prepare students to utilize telehealth in practice.
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Introduction

Telehealth is an evolving field that holds the potential to improve patient outcomes by increasing access to care regardless of clinical setting (Reed, 2005). Health care systems rely on information technology and telehealth in order to manage data and improve communication amongst health care workers and patients (Hawkins, 2012). In years past, clinicians have experienced common difficulties when attempting to obtain appropriate consultation including geographic isolation, limited preventive services, and scarcity of medical specialists (Reed, 2005). Telehealth can address these difficulties as it complements existing healthcare networks by bringing services to those who might not otherwise receive care (Reed, 2005). With increasing use of telehealth, geographic location will no longer dictate health care services that patient populations have access to (Henderson, Davis, Smith, King, 2014). Providers will be equipped with innovative tools to provide healthcare to a greater patient population (Henderson et al., 2014). The final outcome is better access that improves the quality of life for patients throughout the healthcare spectrum.

Competencies can be described as an observable ability of a health professional to integrate multiple components such as knowledge, skills, values, and attitudes (American Association of Colleges of Nursing [AACN], 2015). Since competencies are observable, they can be measured and evaluated to assure their acquisition (AACN, 2015). The AACN suggests that doctoral level programs must develop advanced competencies for the increasingly complex practice of advance practice nursing. Information systems and patient care technology is an essential component of advanced practice nursing (APN) education (AACN, 2006). Doctor of Nursing Practice (DNP) programs should educate students to be proficient in health information technology to improve patient care (AACN, 2006).
DEVELOPING COMPETENCIES FOR TELEHEALTH EDUCATION

Significance

Despite the explosion of telehealth in recent years, a review of current practices reveals a scarcity of programs at the undergraduate and graduate levels that are preparing students to utilize advanced telehealth technologies (Haney, Kott, & Fowler, 2015). It is clear that telehealth is on the forefront of healthcare provision, indicating the need for telehealth education in the nursing curriculum. The limited exposure to telehealth throughout APN education interferes with their understanding and comfort when using telehealth in the clinical setting (Rutledge, Haney, Bordelon, Renaud, & Fowler, 2014). Nursing organizations such as the AACN have encouraged the integration of information technologies into nursing curriculums, but despite these recommendations, the addition of telehealth education into current practices has been slow (Haney et al., 2015). Telehealth education should be incorporated into the curriculum to improve Doctorate of Nursing Practice (DNP) education and prepare them for the clinical setting. The development of telehealth competencies would follow recommendations of the AACN DNP Essentials to improve current educational practices.

Capstone Project Questions

The objective of this capstone project is to identify culturally sensitive and specific competencies to improve telehealth education for DNP students. The PICO question that will be answered over the course of this project is: Will a focus group with BS to DNP, FNP students in the University at Buffalo (UB) NGC 799 DNP Capstone Course II foster the development of culturally sensitive and specific competencies and improve telehealth education in comparison to the traditional practices of telehealth education at UB? In addition to the PICO question that is guiding the project, specific aims have been developed to further enhance this capstone project.
These three specific aims include: 1) How can UB maximize utilization of telehealth equipment available for use? 2) Will resistance be met from current students regarding the use of telehealth in the DNP program? 3) How will the competencies created influence future DNP programs and their use of telehealth including maximization of telehealth equipment use?

**Literature Review**

**Literature Search Strategy**

An extensive review of literature was conducted to assess the current utilization of telehealth in graduate programs. Medical subject headings (MeSH) terms for research were identified and the database PubMed was used to conduct the literature search. PubMed was utilized for the literature search because it consists of biomedical literature as well as the MEDLINE database. The MeSH terms included: problem based learning, competency based education telemedicine, telehealth remote consultation, advanced practice nursing, education, nursing, graduate, DNP, nurse practitioners. Articles published before 2005 and any articles not written in English were automatically excluded. The initial search yielded 161 articles that the researchers reviewed together. Both researchers had to approve each article prior to including them in the literature review. After reviewing all articles yielded in the search, 23 articles were selected for the review of literature.

**Results of Literature Review**

Telehealth, telemedicine, and ehealth are terms that can be used interchangeably to describe the use of technology in the healthcare field (Estes, Gilliam, Knapfel, Lee, & Skiba, 2016; L’Esperance & Perry, 2016). For the purpose of consistency throughout this literature review, the term telehealth will be used to describe these interchangeable terms. The
technologies involved in telehealth include videoconferencing, exchanging medical information via electronic communications, remote patient monitoring, population health management and mobile health technologies (Henderson et al., 2014). Interactions using telehealth applications may occur synchronously or asynchronously (L’Esperance & Perry, 2016). Synchronous applications of telehealth occur in real time such as videoconferencing between patients and providers, while asynchronous applications transmit information that is stored and viewed at a later time (L’Esperance & Perry, 2016).

The use of telehealth technologies has been shown to increase patient satisfaction, improve outcomes, allow for improved work efficiency, and enhance disease management through improved collaboration between patient, provider, and other healthcare team members (Gervera & Graves, 2015). Telehealth is a time efficient, cost reducing form of health care access (Sevean, Dampier, Spadoni, Strickland, & Pilatzke, 2008). In the rural setting telehealth technology is a necessity for delivering care. Telehealth has allowed providers to deliver patient education, assess for changes in patient status, and provide interventions related to the patient’s condition, while the patient remains at home (Gallagher-Lepack, Schiebel, & Gibson, 2009; Sevean et al., 2008). The use of telehealth has been widely adopted by homecare agencies to facilitate early recognition of disease exacerbation, especially in vulnerable populations such as those with chronic diseases (Thomason, Hawkins, Perkins, Hamilton, & Nelson, 2015). Overall, the use of telehealth supports the Institute of Medicine's aims of safe, effective, patient centered, timely, efficient, and equitable care of patients (Fleming et al., 2009).

Telehealth enables distance education and efficient sharing of information, not only for patients, but also between providers who are separated geographically or within institutions (Fleming et al., 2009). The American Nurses Association (ANA) recognizes telehealth as being
within the scope of nursing practice (Sevean et al., 2008). In order for APNs to be well prepared in the clinical setting they must possess theoretical knowledge, clinical skills, and be competent in the use of multiple types of technology (Hawkins, 2012). The AACN developed eight essential areas of curricular content, Essential IV is “information systems/technology and patient care technology for improvement and transformation of health care” (AACN, 2006, p. 12). In order to appropriately use telehealth, the APN should be skilled in using telecommunication technology to assess patients, communicate with health care providers, provide education, and manage patient data (Ali, Carlton & Ali, 2015).

Several key policy statements and professional standards have emphasized the importance of the use of technology to improve patient outcomes (L’Esperance & Perry, 2016). The National Organization of Nurse Practitioner Faculties Core Competencies now require that all APNs be competent utilizing telehealth to address various patient and healthcare system needs (L’Esperance & Perry, 2016). With the increasing use of telehealth technology, a reevaluation of the curricula in healthcare education is needed to prepare the workforce (Estes et al., 2016). Telehealth education should be integrated into APN curriculum to prepare them for practice. Developing an improved knowledge of telehealth allows for APNs in all settings to effectively collaborate with health care professionals to provide enhanced patient care (Gray & Rutledge, 2014).

Growth in the demand for health care continues to increase and as physician shortages widen; APNs and physician assistants (PAs) are expected to play larger roles in health care delivery (Sargen et al., 2011). If training programs for APNs and PAs grow as currently projected, the supply of advance clinicians is expected to be 20% less than the demand in 2025 (Sargen et al., 2011). The need for APNs in the nation’s hospital system is growing and the
student applicants have increased to meet the demands (Forsberg, Swartout, Danko, Delaney & Murphy, 2015). Unfortunately, APN programs are facing barriers including faculty shortage and limited clinical training sites that requires them to limit enrollment (Forsberg et al., 2015). The nurse workforce shortage, coupled with a growing need for faculty, calls for redesign, restructuring, and recognition that the flexibility and availability of technology offers nursing education radical opportunities for innovation (Neuman, 2006).

Our healthcare system is confronted with how to deliver quality, affordable, and timely care to patients in systems already burdened by a lack of providers (Rutldege et al., 2014). Incorporating telehealth into APN education will not only improve their comfort with telehealth use after graduation, it also has the potential to open up opportunities in regards to the limited number of clinical sites and faculty shortages. Telehealth can be used to facilitate communication amongst faculty, students, and preceptors at clinical sites and to conduct clinical visits to evaluate student performances and clinical instructor effectiveness (Grady, 2011). Additionally, there is digital diagnostic equipment that allows for nursing faculty to evaluate student skills in performing patient assessments remotely (Grady, 2011). Incorporating telehealth in this domain could allow faculty to train more APN students to meet the growing demands that we face in years to come.

With the increasing use of telehealth technology, re-evaluation of curriculum in healthcare technologies is needed to prepare the current workforce (Estes et al, 2016). In order to properly implement telehealth into DNP education, it is necessary to first assess the extent to which the program already incorporates information technology skills and knowledge into the curriculum (Choi & Zucker, 2013). This can allow for a better understanding of the current education as well as the areas of weakness, and aid in moving forward to strengthen the
telehealth curriculum. Key factors that must be considered in applying technology to the delivery of education include understanding the technological changes that we have now, envisioning how technology can be used, and creating goals for the future use of technology in practice (Neuman, 2006).

Although telehealth has been a promising healthcare technology, minimal literature exists regarding proper telehealth etiquette (Haney et al., 2015). Telehealth etiquette includes unique behaviors beyond the typical professional behaviors that result in an effective telehealth visit, or more importantly prevent an inadequate telehealth visit (Haney et al., 2015). Caring is a central concept of nursing, and as we develop healthcare competencies to educate APNs in telehealth it is imperative that we maintain the provision of healthcare without taking away from the essence of this profession (Varghese & Phillips, 2009). Strategies such as listening, honesty, competency, and empowerment should be included into future telehealth education (Varghese & Phillips, 2009).

Studies conducted that allowed for APN students to receive telehealth training have illustrated that the preparation improved their comfort level with technologies and allowed students to better understand the benefits of using telehealth (Estes et al., 2016; Rutledge et al., 2014). Estes et al., (2016) conducted a study that introduced APN and Doctor of Pharmacy students to telehealth technology in a simulated inter-professional environment. The use of a standardized telehealth patient with the integration of videoconferencing, telehealth monitoring tools, and an EHR provided a consistent telehealth learning environment for all student participants (Estes et al., 2016). Students described incorporating telehealth technology into the curriculum through this simulation visit as valuable. Students also reported that they were able to
recognize the ability to increase connectivity and communication between patients and the interdisciplinary healthcare team despite distance (Estes et al., 2016).

A telehealth study conducted by Rutledge et al., (2014) involved the education of APN students through a telehealth simulation workshop. The components of this activity included a simulated face-to-face visit, a simulated telehealth visit, a telehealth immersion experience, and a telehealth project. This telehealth project assisted the students in fully experiencing the immersion by writing a paper that summarized their experience of telehealth in practice, including both benefits and barriers of using healthcare technologies (Rutledge et al., 2014). APN students expressed that by receiving telehealth training, it is possible to assess and treat physical conditions without having face-to-face contact with patients (Rutledge et al., 2014).

Telehealth is becoming a more common method to deliver healthcare, and in the near future telehealth will no longer be a new or novel approach; it will be the standard of care (Rutledge et al., 2014). The use of telehealth improves patient access and allows for timely, efficient, and equitable care to patients across all healthcare settings. Increasing the number of APN students as well as their knowledge and comfort in delivering care through the use of telehealth can aid in improving the future of healthcare delivery. An opportunity exists to develop a curriculum in which nurses can shape education by strategically incorporating technology-enhanced practices to prepare APNs for the future of healthcare (Erickson, Fauchland, & Ideker, 2015). Advances in technology-enhanced education have the capacity to revolutionize the traditional nursing curriculum and benefit students, providers, and patients as we move forward in health care delivery (Grady, 2011).
Needs Assessment

Health disparities exist in rural populations due to the lack of adequate provider coverage (Rutledge et al., 2014). Providers that practice in the rural setting are overloaded with patients, making it difficult for them to provide comprehensive care. For example, the Tuscorora Indian Nation in Niagara County, New York is one of eight federally recognized tribes in New York State. The majority of the patient population on the Tuscorora Nation receives medical care from a reservation-based clinic. The clinic serves an average of 5.3 patients per day, and due to the complexity of the patients served, there is limited time for walk-in or add-on visits. The rural setting of the Tuscorora Nation coupled with the chronic medical conditions that Native American Indians face further increases the risk for health disparities.

A needs assessment conducted by Dr. Austin-Ketch at the University at Buffalo (UB) indicated that many Native American patients in this rural setting voiced a need for counseling or additional information on aspects of care related to chronic medical and mental health concerns (Austin-Ketch, 2016). These patients were referred to ancillary services outside of the clinic setting, although APN students would be fully capable of providing this information and would have the additional time built in to address these issues comprehensively. APN students could provide this information via telehealth visits in collaboration with UB faculty, which could alleviate patient concerns and increase the access to care for the Native American population.

Since the opening of the DNP program at UB in 2011, the number of qualified applicants has exceeded the number of students the school can accommodate due to preceptor and faculty resources. The use of telehealth can connect students directly to UB faculty and allow for the expansion of clinical sites in rural settings. UB clinical faculty can supervise students and
deliver patient care in telehealth clinical models, but first students must be adequately prepared to use telehealth technologies to deliver comprehensive care and limit health disparities.

Theoretical Framework

Theoretical frameworks are a necessity when developing a doctorate level scholarly project. Theories assist DNP students in planning and organizing specific interventions that are aimed at promoting health (Christenbery, 2011). The review of current telehealth education and the development of culturally sensitive competencies can be improved by incorporating Bloom’s taxonomy of learning. Bloom's taxonomy is an educational model comprised of six categories within the cognitive domain (Bouchard, 2011). Created by Benjamin Bloom during the 1950s, Bloom’s taxonomy provides a method to categorize the levels of reasoning skills required in classroom situations (Bouchard, 2011). Educational models that incorporate Bloom’s taxonomy incorporate higher levels of education, compelling students to embrace more challenging concepts.

Bloom’s taxonomy classifies thinking skills into six hierarchically organized categories that range from lower-level cognitive skills, to higher-order cognitive skills (Stanny, 2016). The lower-level cognitive skills in the model are: knowledge, comprehension, and application, while the higher-level cognitive skills are: analyze, evaluation, and synthesis (see Figure A). However in the 1990’s Bloom’s taxonomy was revised, and the six cognitive domains are now: remember, understand, apply, analyze, evaluate, and create (Stanny, 2016). The levels of thinking are ordered from least to most complex, with remember being the least complex, and creating being the highest complexity (Pecka, Kotcherlakota, & Berger, 2014). Since its publication, teachers have relied on Bloom’s taxonomy to guide how they write learning objectives, structure learning
activities, and assess student learning. Bloom’s taxonomy has influenced how instructors design their courses, describe student outcomes, and create assessments of learning (Stanny, 2016).

The development and implementation of telehealth competencies would require the use of higher level of thinking by analyzing the current practices, creating competencies, and applying these competencies in a focus group with current DNP students. According to Krathwohl (2002) Bloom’s taxonomy defines applying as carrying out or using a procedure in a given situation by executing or implementing a learned skill. DNP students will feel more prepared to practice using telehealth if they have already applied these skills throughout the course of their education. Higher thinking assessments evaluate the ability to transfer knowledge into the real world (Kantar, 2014). The goal of this project is to improve telehealth education so that DNP students are able to transfer their knowledge on telehealth into practice following graduation.

Bloom’s taxonomy consists of a framework, which is categorized into three domains: cognitive, affective and psychomotor (Schwartz, 2012). The cognitive domain of Bloom’s taxonomy is composed of the ability to remember, understand, apply, analyze, evaluate and create knowledge (Schwartz, 2012). The investigators can utilize the cognitive framework provided by Bloom’s taxonomy by creating competencies that educate the DNP students on the importance and use of telehealth. Next, the affective domain of Bloom’s taxonomy is composed of the ability to receive, respond, value, organize, and internalize (Schwartz, 2012). The affective domain of Bloom’s taxonomy will aid the DNP students in understanding how telehealth is able to provide care for patients in rural and underserved communities. Finally, the psychomotor domain of Bloom’s taxonomy is the development of skills that require practice and can be measured in terms of speed, precision, distance, procedures, or techniques in execution.
DEVELOPING COMPETENCIES FOR TELEHEALTH EDUCATION

(Schwartz, 2012). The psychomotor domain of Bloom’s taxonomy will urge DNP students to participate and succeed in the hands-on use of telehealth inside and outside of the classroom.

An educational program often requires a course that combines lower-level and higher-level concepts in order for students to have a thorough comprehension of the curriculum. The lower level concepts in Bloom’s taxonomy are often utilized in 100 and 200 level courses where the emphasis is placed on knowledge and comprehension (Ahmed, Anwar, Ulkahkhan, Idris, & Ameen, 2014). Whereas in 300-400 level courses, or graduate level courses, higher-level concepts are utilized such as analyze, synthesis, and evaluation (Ahmed et al., 2014). By creating competencies that relate to the lower-level understanding of telehealth, and the higher-level utilization of healthcare technologies, the DNP students should acquire a comprehensive knowledge of telehealth.

The framework provided by Bloom’s taxonomy is frequently utilized by educators to create comprehensive learning objectives for students. Bloom’s taxonomy provides an inclusive collection of action verbs that would greatly aid in our task of creating competencies for DNP students. The collection of action verbs described by Bloom’s taxonomy help to reduce the ambiguity about the levels of expertise instructors describe when they select language to write learning outcomes about the academic goals for a course (Ahmed et al, 2014). By utilizing specific, measurable, verbs while creating an outline for a course, both students and faculty have a better understanding of the expected outcomes for the course.

Competencies of education cannot be developed without the incorporation of both the curriculum and clinical education (Kantar, 2014). The use of the Bloom’s taxonomy of learning will aid in the development of competencies by incorporating a higher order of thinking into
telehealth education. According to Kantar (2014) higher order thinking in Bloom’s taxonomy includes analysis, synthesis, and evaluation. The use of educational activities that promote higher levels of learning facilitate student achievement of skills that are necessary to be successful following graduation (Ahmed et al., 2014).

The goals of higher order of thinking include both problem solving and knowledge transfer. Instructional techniques such as simulation and integration can allow for students to test their skills and apply knowledge into practice (Kantar, 2014). The data collected from the focus group will reveal the participant’s thoughts and feelings about the hands-on experience with the telehealth units and ultimately promote the investigators in developing competencies regarding telehealth education. The application of learned skills will enable the students to practice as competent providers and advance the future of healthcare delivery.

Since Bloom’s taxonomy is a framework dating back to the 1950’s, the investigators were unable to contact the creator of the taxonomy to receive permission to use his work for our project. However, the project investigators were able to contact scholars who utilized Bloom’s taxonomy while designing a curriculum for undergraduate students. Ugur, Constantinescu, & Stevens (2015) described and designed a school-based curriculum that integrated core elements of self-determination with the sequential levels of cognitive and affective learning articulated by Bloom’s taxonomy in order to facilitate student self-development. They discovered that incorporating cognitive learning into the curriculum yielded favorable student outcomes. By contacting the authors of the study the investigators have been granted permission to reference their work and use their study as a model for this project.
Educators have incorporated Bloom’s taxonomy of learning into their teaching curriculum for decades (Bouchard, 2011). Doctorate level courses require students to master learning at a level that involves combining elements and parts so as to form a whole and to constitute a pattern or structure not clearly there before (Handy & Basile, 2005). By utilizing a comprehensive learning theory, such as Bloom’s taxonomy, the project investigators will be able to create effective competencies to improve telehealth education for DNP students.

**Methods**

**Design**

The project investigators utilized qualitative research methods by conducting a focus group and an individual interview to obtain participant feedback. An educational session was held prior to the focus group and individual interview to allow project participants to gain familiarity with the telehealth units available at the University at Buffalo. The educational session consisted of a one-hour in-service on the telehealth equipment and one-hour of firsthand experience. During the in-service, the project investigators introduced the telehealth units to the students and demonstrated the capabilities of the unit. The students had the opportunity to ask questions regarding the functionality of the telehealth units throughout the educational session. Directly following the in-service, participants had the opportunity to assemble and utilize the applications of the telehealth unit. The project investigators ended the session by completing a videoconference call between two telehealth units in order to demonstrate the sharing of information between units. Data was not collected during the educational session.

Following the educational session, data collection was conducted through the use of a focus group and individual interview to obtain the participant’s thoughts and experiences. The
project investigators developed effective questions for the focus group and interview by utilizing a guidebook approved by an expert in qualitative research at UB. The questions were used for both the focus group and the individual interview so that all project participants discussed the same topics regarding telehealth education.

Individual interviews are the most widely used data collection strategy in qualitative research (Lambert & Losielle, 2008). Individual interviews are chosen by researchers to collect detailed accounts of participants’ thoughts, attitudes, beliefs, and knowledge pertaining to a given phenomenon (Lambert & Loiselle, 2008). The interviews can be conducted either in structured, semi-structured, or informal methods (Lambert & Losielle, 2008). For this capstone project, the investigators used semi-structured interviews by asking developed expert vetted questions, but allowed for additional questions to arise throughout the course of the interview based on discussion.

Focus groups are typically composed of six to twelve participants and a trained moderator with the purpose of learning more about attitudes and opinions on a given topic (Massey, 2011). Since two investigators completed this project together, one researcher took detailed notes during the focus group while the other asked questions and generated discussion. The interaction that takes place during a focus group session allows for data production and insights that would be less likely without the sharing of ideas that occurs in the group setting (Pawi, Putit, & Buncuan, 2010). Research has indicated that listening to others’ verbalized experiences stimulates memories, ideas, and experiences in members of the focus group to enhance the discussion (Pawi et al., 2010). Data obtained from focus groups can provide the richest form of qualitative data for analysis, but it is also at highest risk for misapplication and
misinterpretation (Massey, 2011). Having two investigators involved in conducting the focus group reduced the risk of error when interpreting the collected data.

Focus groups and individual interviews are two different methods of obtaining qualitative data, but their combination can provide an advantage to researchers as additional views of the phenomenon may be generated (Lambert & Losielle, 2008). Additionally, there are pragmatic reasons for combining focus groups and individual interviews (Lambert & Losielle, 2008). For instance, individual interviews may be offered to participants that were unable or unwilling to attend the focus group (Lambert & Losielle, 2008). The combination of these two methods can lead to increased response as participants can choose the method of participation that is most convenient for them (Lambert & Losielle, 2008).

Setting

This capstone project took place at the University at Buffalo from fall 2017 to spring 2018. The educational session and focus group took place in a private room in Wende Hall. A sign was placed outside of the room indicating that a focus group was in progress and to not disturb.

Population

The participant population included current BS to FNP, DNP students enrolled in the NGC 799 course. An informative email was sent to the DNP students registered in class NGC 799 DNP Capstone Course II requesting for participants for the project. The demographics of this participant population included DNP students in the twenty to thirty year age ranges. The project investigators aimed to have six to twelve participants in order to complete both the educational session and focus group. The sample size of six to twelve participants is thought to
include enough participants to yield diversity in information provided, yet not have such a large group that participants do not feel uncomfortable sharing their thoughts, opinions, and beliefs (Onwuegbuzie, Dickinson, Leech, & Zoran, 2008). Before beginning the project the researchers obtained verbal consent from the participants indicating that they agreed to take part in the project and that they agreed to be audio recorded during the focus group.

**Recruitment**

The recruitment process to gain potential participants took place in the fall of 2017. An informative email was sent to the students enrolled in DNP Capstone Course II, NGC 799 inviting them to participate in a two-hour telehealth educational program (see Appendix A). They were also informed that following the educational session a research focus group would be held. The investigators accessed the email addresses of students in the course from the online course platform venue of tools. Participants were offered incentives to participate in the project, but were not coerced in any way. Lunch was provided as an incentive and each participant received a five-dollar gift card to Tim Horton’s at the completion of the focus group.

**Data Collection**

The focus group was audio-recorded using two hand-held recorders. Two recorders were used to ensure that all data was collected. Field notes were taken by one investigator to record quotes, non-verbal cues and key points discussed during the focus group.

**Data Analysis**

The audio recording was transcribed in order to vigorously review the data. The transcribed data was kept on the investigator’s personal laptops and password protected. The
data was only shown to UB faculty when necessary. Once the data was transcribed the process of coding began to interpret the data. Coding provides a method to assign a summative, salient, essence-capturing phrase or symbol to qualitative data (Saldana, 2009). The process of coding is a way to condense data, and the researchers may choose to organize the coded material in large or small groupings, effectively slicing the data in a fine or coarse manner (Elo & Kyngas, 2013). Writers of joint research projects advocate that coding should be a collaborative effort in order to bring multiple ways of analyzing and interpreting the data (Saldana, 2009). Both researchers can code the gathered data in order to provide a “reality check” for each other (Saldana, 2009). Multiple cycles of coding by both project investigators took place to ensure that significant evidence was extracted from the data. By coding the data the researchers can generate common themes and concepts apparent in the data.

The project investigators applied thematic analysis to the coded data to understand underlying themes and how they relate to the functioning of a certain program (Massey, 2011). This approach suggests that qualitative analysis involves the search for common themes emerging from group dynamics and open interplay among participants (Massey, 2011). Thematic analysis is comprised of three different types of data—articulated data, attribution data, and emergent data (Massey, 2011). Articulated data arises from responses to direct questions from the moderator (Massey, 2011). Articulated data consists of attitudes, beliefs, observations, experiences, opinions and preferences that are all referents to the question posed by the researcher (Massey, 2011). In contrast, attributional data is derived from comments and discussions about research questions that the evaluator brings to the study (Massey, 2011). Consequently, emergent data is information that contributes to new insights and hypothesis formation (Massey, 2011). Emergent themes included those that have not been hypothesized, the
unasked questions that seem to be addressed in the stories, anecdotes, explanations, and conversations among participants (Massey, 2011). The qualitative expert also reviewed the thematic analysis interpretation.

A theme captures something important about the data in relation to the research question and represents a level of patterned response or meaning within the data (Braun & Clarke, 2006). Themes are not dependent on quantifiable data, but rather it must capture something important in relation to the overall research question (Braun & Clarke, 2006). The themes that are revealed through coding of the focus group data aided the investigators in the development of competencies regarding the use of telehealth in DNP education.

**Validity & Reliability**

The project investigators utilized specific strategies to increase the rigor of the project. The procedures of the project were derived from clearly identified research questions, which established the dependability or reliability of the project (Colorafi & Evans, 2016). In qualitative research it is a universal factor to ensure elements of validity in the content analysis (Elo & Kyngas, 2007). The internal validity of the project was strengthened by centering the project on a theoretical framework, while the external validity was represented by explicitly describing the procedures of the project in order for the results to be examined further by future researchers (Elo & Kyngas, 2007). Having two investigators working on the project and reviewing each other’s work also strengthened the validity of this project. Additionally having the collected data reviewed by a qualitative research expert strengthened the validity of the project.
Ethical Considerations

It was imperative to inform the student participants that the project had absolutely no regard to their current status at UB. Participation in the project was not required for DNP students, and their thoughts and attitudes regarding the project did not affect their standing in NGC 799 DNP Capstone Course II. The participants were informed that they could refuse to answer any questions during the focus group and they could leave at any time. The investigators obtained verbal consent from the students prior to the focus group. The participants also consented to be audio recorded during the focus group.

Another ethical concern in the project was confidentiality. It is not always possible to protect confidentiality in a focus group; as people discuss and interact, they are disclosing information that could be private or personal (Pawi, 2010). All responses were reported as aggregate or grouped data. The data collected was not recorded in any way that could associate a name with the participant. The notes taken during the focus group did not record any personal identifiers. The investigators informed the participants prior to the focus group to avoid stating any of the participant’s names or personal information during the focus group.

Scope and Limitations of Project

The nursing profession urgently needs professionals with knowledge to support the delivery of safe, cost efficient, evidence-based quality health care (Buchholz, Budd, Courtney, Neiheisel, Hammersla, & Carlson, 2013). DNP programs are preparing graduates to be able to practice at the highest level in multiple clinical settings, leading the way in the application and translation of disseminating successful research findings into practice (Buchholz et al., 2013). The number of DNP programs is increasing rapidly. In 2006, there were only 20 DNP programs
and there are now over 180 DNP programs in the United States (Buchholz et al., 2013).

Providing specific and detailed information about how to operationalize the research competencies necessary for DNP curriculum is important (Buchholz et al., 2013).

The DNP curriculum is constructed upon eight essentials developed by the AACN. Many factors contributing to the essentials of the DNP program regard the importance of technology and future graduates being prepared for the advancements in the medical community. Essential II of the curricula is: “Organizational and Systems Leadership for Quality Improvement and Systems Thinking,” (AACN, 2006, p. 10). This essential states that the DNP program prepares graduates to evaluate care delivery approaches and meet current and future needs of patient populations. Essential IV: “Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care,” (AACN, 2006, p. 12). This reinforces that DNP graduates are distinguished by their abilities to use information systems/technology to support and improve patient care and healthcare systems, and provide leadership within healthcare systems and/or academic settings (AACN, 2006).

BS to DNP students recognize the fragmentation and failures of the current health care system and the demand for practitioners who are change agents and caring providers (Brown & Crabtree, 2013). In choosing the DNP degree, they are committed to optimizing health care delivery (Brown & Crabtree, 2013). The goal of DNP education is to reduce the lag time between discovery of knowledge and its implementation in practice (Brown & Crabtree, 2013). Despite technological advances in communication technology, an unacceptable lag exists between the production of knowledge and the translation of that knowledge into health care that benefits patients (Brown & Crabtree, 2013). Reevaluation of DNP curriculum is needed to ensure that graduates have the ability to practice at the most advanced level of nursing (Brown &
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Crabtree, 2013). Incorporating telehealth into the DNP curriculum would aid in expediting the use of technology in the healthcare community. This project aimed to create competencies that integrate telehealth into DNP education in order to improve healthcare delivery.

One limitation of this project was the small sample size of students, which may have limited the data collection. This project has the potential to influence the future of DNP education, however without a large volume of data the results may have less impact on healthcare delivery. The sample students in the NGC 799 DNP Capstone Course II class are all in the twenty to thirty-year-old age range. This is a very specific set of students and may limit translation of data into practice. Students that have been exposed to technology throughout their education, such as the age range of our sample, may report less difficulty using telehealth than those with less exposure. An additional limitation of this project was the fact that project participants consisted of students that are currently enrolled in the DNP program. This could have created a bias since student participants may have felt that they could not be honest with the project investigators.

Results

Focus Group

Both a focus group and an individual interview were held to obtain appropriate feedback for the thematic analysis. The focus group (N=5) took place on Thursday November 30th 2017 at two o’clock in the afternoon following a two-hour educational session with all five participants. The focus group began at 2:05 p.m. and was completed by 2:51 p.m. The investigators made efforts to recruit for a second focus group for additional participant feedback using the same recruitment methods they had used for the initial focus group. Despite the efforts, only one
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participant was able to attend, making it an individual interview. The interview took place on
Wednesday January 24\textsuperscript{th} 2018 at twelve thirty in the afternoon. The individual received the same
informative session as the focus group and their feedback was obtained following the education.
The individual interview began at 12:35 p.m. and was completed at 12:51 p.m.

The focus group and individual interview were audio recorded and downloaded to the
investigators’ personal password protected laptops. Each investigator transcribed the audio
recordings verbatim. Data transcription, though time consuming is a way for investigators to start
familiarizing themselves with the data prior to coding (Braun and Clarke, 2006). Following the
initial transcription, the investigator’s transcript documents were compared for accuracy and
shared with an expert in qualitative research prior to the initiation of coding. Participant names
were not shared in the transcription for the protection of privacy.

The transcripts were analyzed thematically by both investigators to search for common
themes amongst the data using the guidelines developed by Braun and Clarke (2006). These
guidelines include five phases: (1) familiarizing yourself with your data, (2) generating initial
codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes (Braun &
Clarke, 2006).

Thematic Analysis

Several themes emerged from the coded data regarding current telehealth education,
participants’ thoughts on the utilization of telehealth, the necessity of telehealth education, and
ideas for future telehealth education. In regards to current telehealth education, the participants
reported limited exposure to telehealth at the University at Buffalo prior to the educational
session that they received during the capstone project. Participants state the current educational
DEVELOPING COMPETENCIES FOR TELEHEALTH EDUCATION

practices are minimal, reporting it to be “brushed over” and included “no formal training.” The general consensus was that the majority of what participants knew about telehealth was learned through reading other people’s capstone projects. Two participants reported that telehealth may have been discussed in the health informatics course or written about on discussion boards, but none stated that they had formal training or hands-on experience with telehealth units.

Despite the fact that participants reported receiving little formal education on telehealth, they were aware that telehealth was being used and had an idea of some of the functionalities that it offered both patients and providers. They mentioned that telehealth is often used for consulting and that it is a way for providers to communicate with patients that are not able to be physically present in the office. Multiple participants termed that telehealth was filling a void in locations where patients have limited access to medical services, including rural areas as well as home healthcare.

The participants were able to illustrate benefits as well as disadvantages to telehealth utilization in the current healthcare community. The benefits were mainly comprised of increasing patient access to care, improving the triage process, and allowing NPs to fill the gap in the primary care setting. The participants mentioned that telehealth could be especially beneficial to hospitals in rural areas with limited resources in terms of specialty providers. One participant mentioned that there are often reasons that patients do not want to come to the office to seek care. She reported that when using telehealth for community outreach it could reduce trips that patients would need to make to the office for follow up if they were able to transmit information to the provider electronically. Participants also reported that telehealth could improve the triage process by determining, through the use of video conferencing, if patients could be managed in the rural setting or if they needed to be transported to a higher level of care.
Participants also mentioned that telehealth could allow nurse practitioners to fill the gap in primary care. They reported that with many physicians leaving the primary care setting for hospitals and specialty care, telehealth would allow nurse practitioners to step up and fill the role. They again mentioned the use of telehealth for consulting specialists from the primary care setting and also reported it would be beneficial for nurse practitioners working independently by allowing them to obtain a second opinion from a colleague that is not physically available.

The participants were able to report a variety of advantages to using telehealth, but they also mentioned a number of limitations that may arise from the utilization of telehealth. These disadvantages revolved around three main themes: technical difficulties, barriers in the clinical setting, and taking away from the current DNP curriculum. Several concerns regarding technical difficulties arose throughout the course of the focus group. Participants reported they would be apprehensive about using telehealth because the units rely on Internet. One participant reported that technological problems that may occur would be more prohibitive than an error with the electronic medical record (EMR). They also reported that the visuals on the telehealth unit were harder to see on the screen than they would be in real life. They specifically mentioned concern over the visualization of the ears, reporting that they were “fuzzy” on the screen and did not depict a clear picture. Finally, participants reported that all telehealth units are different, and having experience with one, does not necessarily mean you are a master at telehealth on the whole.

Several participants voiced concern that telehealth could represent a barrier in certain clinical settings. One participant stated that she saw telehealth as “a barrier to seeing patients,” putting yet another divide between the provider and the patient. The participants reported that it would be difficult to build a rapport with a patient via videoconference, which may affect their
assessment of the patient. Furthermore the participants agreed that it would be preferable for a patient to be seen in person, however when that is not realistic or possible, telehealth is an effective substitute. Participants identified other obstacles to implementing telehealth in the clinical setting such as: time, cost and lack of interest.

As students, the participants were apprehensive about utilizing telehealth since there is often information they do not want to share in front of the patient. One participant provided the example of stepping outside of the patient’s room with the telehealth unit in order to have a dialogue with their preceptor. Another participant reported that she would “feel intimidated” by not having her preceptor with her in the clinical setting. The participants expressed that they would prefer to be surrounded by a cohort of colleagues as a new graduate instead of utilizing telehealth as a resource.

A few participants were reluctant about incorporating telehealth into the DNP curriculum. They were concerned that telehealth education could replace other subjects that students have interest in. The participants shared that they need to feel confident as APNs before learning about adjunct technologies. They were troubled that the DNP program already has an emphasis on research, and the addition of telehealth could minimize therapeutic education. Participants compared learning telehealth to an EMR that could be completed as “on the job” training. The participants expressed that having a familiarity with telehealth is sufficient; a course regarding telehealth is not necessary. Additionally, the participants shared that they would not want a telehealth experience in lieu of clinical hours. They stressed the importance of face-to-face patient experiences to gain confidence in their assessment skills. The participants reiterated that they do not have an issue with telehealth education; however they are more concerned with
learning how to be nurse practitioners. One participant stated “telehealth is just technology to help us do our jobs, we have to be competent to be nurse practitioners in the first place.”

The participants discussed at length the generational differences in embracing technology. They felt that younger students could easily transition to utilizing telehealth in the medical community with little to no education. The participants reported that technology is a part of their daily life and they are not intimidated by innovative technology. The participants did express that older students may benefit from telehealth education, however more senior providers may not be as accepting of telehealth technology. The students also expressed that older providers may have difficulty embracing telehealth. Furthermore the participants addressed that elderly patients may not understand the telehealth equipment and think they are being recorded or that their personal information is being shared online.

The participants continued to discuss that the elderly population might not be the only population to have issues with telehealth. They reported that telehealth technology offers little privacy for the patient. One participant specifically mentioned “patients with personal complaints such as an abscess or genital warts could feel uncomfortable exposing themselves to the camera.” The participants voiced that some patients will accept telehealth while others may not. Despite the fact that participants felt that patients may be reluctant to utilize telehealth at first exposure, they agreed that ultimately overtime people will become more accepting of telehealth.

While some participants did comment that the telehealth unit was “bulky” or a “contraption,” they were also impressed by the advancements of the telehealth technology. They described the telehealth unit as “user friendly” and stated that the device follows a step-by-step
approach in order to set it up. The participants were impressed by the multiple applications of the telehealth unit, including: the stethoscope and the fact that the unit can transmit images to other providers. They articulated the convenience of recording an electrocardiogram and sharing it with other specialists. Participants reported that prior to this experience they did not understand all of the different facets of telehealth. The participants thought it was remarkable how small the telehealth unit is since it contains such diverse applications. Multiple participants commented that they could visualize themselves working with telehealth in the future.

Throughout the discussion the participants identified numerous purposes for telehealth education. They recognized that telehealth will be “blossoming” in the very near future, and as students it is necessary for them to build a familiarity with technology. Likewise the participants came to the conclusion that exposure to telehealth could aid in their career search. One participant reported that previous experience with telehealth could enable her to find employment in an environment that utilizes telehealth, or in an environment that is interested in implementing telehealth in the future. The participants agreed that having a familiarity with telehealth would ultimately set them up for success since it is often expected that providers in today’s medical community are fluent with technology. They realized that learning about telehealth as a student could enable them to recognize potential limitations with technology, and prepare them to embrace telehealth as a professional.

The participants acknowledged that telehealth education embodies the DNP Essentials and Outcomes. Specifically the participants selected Essential II, which states “Organizational and Systems Leadership for Quality Improvement and Systems Thinking” (AACN, 2006, p. 10). The participants expressed incorporating telehealth into the medical community could be viewed as a quality improvement strategy. Additionally, multiple participants identified Essential IV,
“Information Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care” (AACN, 2006, p. 12). Participants agreed that innovative technology such as telehealth would improve patient outcomes and aide in the transformation of health care. The participants also felt that Essential VI, “Interprofessional Collaboration for Improving Patient and Population Health Outcomes” (AACN, 2006, p. 14), represented telehealth. Since telehealth can be utilized as a consulting tool to connect specialists in various settings and subsequently provide superior patient care.

The participants also identified Outcome 2, “Provide leadership in ethical, legal and sociocultural issues for the improvement of nursing practice, patient outcomes and health care delivery,” (University at Buffalo School of Nursing, 2017-2018, p. 22), as critical to the incorporation of telehealth. They reiterated that incorporating telehealth would demonstrate leadership and ultimately improve practice for APNs. Furthermore, participants felt that Outcome 3 exemplified telehealth by stating “Develop and evaluate care delivery approaches that meet current and future needs of patient populations based on scientific findings in clinical sciences as well as, organizational, political and economic sciences” (University at Buffalo School of Nursing, 2017-2018, p. 23). They voiced that telehealth provides a diverse healthcare delivery solution to serve the future of the medical community.

Finally, the participants gave several innovative ideas for future DNP education at the University at Buffalo. The participants agreed on three main methods for including telehealth education into the curriculum comprising of: adding it to the assessment class, incorporating telehealth into simulation, and integrating telehealth education into the current informatics class at UB. The overall consensus was that regardless of the way that it is incorporated into future education, there is a need for hands on experience with telehealth education. One participant
stated “my take away from today is that it is useful to have hands on exposure to telehealth.” Several other students agreed that actually using the telehealth equipment first hand is necessary in order to gain familiarity with the equipment and build an understanding of its’ capabilities.

In regards to the assessment class, participants felt that the telehealth units would be a great adjunct to the current class at UB. One student reported “if everyone got to use a telehealth unit during our physical examination class it would be a really good jumping off point for learning telehealth.” Another participant added, “Using a telehealth unit while performing a physical assessment could be the best use of it.” The participants felt that including the telehealth unit into an assessment lab would allow students to spend time practicing with the equipment to gain a familiarity with it.

Participants also voiced that a simulation experience would be a beneficial method for incorporating telehealth into the curriculum. Multiple participants expressed that simulation would be an opportunity to demonstrate their clinical knowledge while also learning the technology. Participants suggested that a telehealth simulation could also allow students to collaborate with other interdisciplinary professionals at the University at Buffalo, including nursing, pharmacy, medical, and dental students. They reported that using the telehealth unit in a simulation experience would require students to demonstrate their knowledge by asking the right questions and collaborating with others in order to collect pertinent information. The participants stressed that the simulation experience should focus on learning the telehealth equipment while interacting with other professionals rather than using the experience as a graded assignment.
An additional idea that participants mentioned for incorporating telehealth into the curriculum was to include hands on experience throughout the course of the Informatics class that is currently a part of the program. One participant stated “I think it may be more appropriate to include telehealth in something like the informatics class so we don’t take away from learning therapeutics.” They did report that the informatics class is currently an online course, and they would want to be able to use the equipment first hand. Overall the participants relayed that telehealth education needs to include hands on experience and should not take away from therapeutic education.

**Competencies for Future DNP Telehealth Education**

Student progression towards DNP essential competencies validates that they have adequate knowledge, skills and abilities for potential employers (Hande, Beuscher, Allison & Phillippi, 2017). It is necessary to develop customized strategies to ensure mastery of the DNP essential competencies (Hande et al., 2017). The Institute of Medicine (IOM) recommends health professionals should be educated to address 6 core competencies: patient-centered care, teamwork and collaboration, evidence based practice, quality improvement, safety and informatics (Acton et al., 2017).

According to the National Organization of Nurse Practitioner Faculties (2017) technology information and literacy competencies are a necessity in educating DNP students. There are several core competencies that should be included in order to assure that a doctorate level student is well prepared to utilize health information systems such as telehealth after graduation. Many considerations must take place in order to develop competencies that demonstrate an effective understanding of telehealth technology. The core competencies must be supported by
The research collected throughout the focus group and individual interview allowed the investigators to develop telehealth specific competencies to improve DNP education (see Table 1). The investigators determined that students must first develop a basic understanding of health information technologies and how technology can be used to enhance and improve patient care. Students should be educated on telehealth and be able to identify the applications of healthcare technologies that can be used to improve care in the clinical setting. The students should also be able to demonstrate the ability to use telehealth units to monitor patients. The telehealth units can monitor patients by recording vital signs, blood glucose, and EKGs. The students should understand and be able to perform each one of these forms of patient monitoring and surveillance. The students should also demonstrate that they have the ability to teach potential patients about telehealth technology and the specific monitoring instruments.

It is imperative that students comprehend the necessity of protecting patient privacy while utilizing telehealth. Students should exhibit the ability to utilize telehealth technology while respecting patient confidentiality, and they should recognize when patients are not comfortable or willing to use telehealth. Additionally, the student should distinguish situations in which telehealth technology would be the most appropriate for providing patient care and improving patient outcomes. Students should be able to demonstrate mastery of telehealth units through a simulation experience. They would be required to provide patient care and present a patient case to a clinical staff member using telehealth technology. Finally, the students should be able to consult other interdisciplinary team members via the telehealth unit in a simulation setting. Consultation of specialty providers is an application of telehealth that is commonly used...
to improve patient outcomes. It is imperative that students feel confident using telehealth to consult other providers for feedback.

**Discussion and Recommendations**

The themes that transpired from the focus group, along with the relevant literature, may aid in integrating telehealth into DNP education. One predominant theme is that as technology advances, telehealth will become more essential to the medical community. By acknowledging the direction of healthcare and continually guiding nursing curriculum to stay up-to-date, students have an opportunity to be better prepared to practice in the ever-evolving health care environment (Estes et al., 2016). Preparing nurse practitioner students for practice must include more than information technology knowledge in graduate nursing programs. Formal clinical experiences using various telehealth applications must be integrated into nurse practitioner training (Hawkins, 2012).

In order to meet the continuous changes and innovations within the health care system, nurse practitioner faculty must look to the future and prepare nurse practitioner graduates who deliver safe, quality patient care addressing the realities of a global society with a fast-paced expansion of technologies (Hawkins, 2012). Multiple participants voiced that they could visualize themselves working with telehealth in the near future. Innovative strategies explored by nurse practitioner faculty will assure that graduates can meet the technological demands of our current health care society (Hawkins, 2012).

Collaboration skills and proficiency in telehealth communication technologies are essential competencies for all advanced practice nurses and especially important for those in rural or remote sites (Gray, Rutledge, 2014). In today’s medical community many APNs work
with disadvantaged or rural populations. At least eighteen percent of all nurse practitioners (NPs) currently work in rural or distant practice areas often without direct access to other nursing and physician colleagues. This is specifically important when specialty health care providers are needed for consultation (Gray & Rutledge, 2014).

The participants of the focus group identified that telehealth technology would be helpful for APNs working in rural communities or providing home care services. They suggested that telehealth equipment would offer a method to contact other providers or collaborate with other specialists. They also acknowledged that the diverse technologies of the telehealth equipment would allow APNs to securely transmit patient information, such as EKGs, recorded heart sounds, or blood glucose readings, to other providers. Furthermore, the participants recognized that telehealth technology could improve the access to care for psychiatric patients. There is a vast shortage of mental health providers in rural communities. Often primary care providers are compelled to treat patients suffering from mental illness without the expertise of mental health professionals (Henderson et al., 2014). Telehealth allows patients in rural communities to have access to the same level of care as those in larger cities by using videoconferencing to conduct mental health evaluations and regular follow-up (Henderson et al., 2014). Developing a better working knowledge of telehealth and new communication technologies can enable APNs in potentially all settings to more conveniently consult other health care professionals for improved patient care (Gray & Rutledge, 2014).

One innovative strategy the participants recommended to integrate telehealth into the DNP curriculum was a simulation experience involving multiple interdisciplinary professionals. Graduate students who have completed telehealth simulation experiences have stated that they valued the experience since it provided the opportunity to practice working as an
interprofessional team (Estes et al., 2016). The students recognized that each professional has their own set of knowledge and experience to share during the simulation. The students confirmed that the telehealth simulation experience aided to improve the gap within interprofessional communication (Estes et al., 2016).

The focus group and individual interview also revealed many barriers to integrating telehealth into the DNP curriculum. One dominant barrier the focus group and individual interview identified is the need for hands-on clinical experiences. The participants of the focus group stressed that even though a telehealth experience may be helpful, they would not want the experience in lieu of clinicals. The members of the focus group voiced that they need to feel confident in face-to-face interactions before attempting to integrate telehealth into the clinical setting. Grady (2011), described a study where student participants were involved in a telehealth experience. The participants involved in the study agreed that a telehealth experience could help prepare them for clinical however, they would not want it in place of an actual clinical experience (Grady, 2011). The majority of students confirmed that the biggest drawback of the telehealth-delivered clinical remains the lack of a hands-on experience and limited access to the patient (Grady, 2011). Telehealth education may be more beneficial if incorporated later in the curriculum when students feel confident in their doctorate level assessment skills.

Another barrier the participants conveyed during the focus group is that the use of telehealth technology could affect the provider-patient relationship. The participants expressed hesitation to utilizing telehealth technology because it could be more difficult to build a trusting relationship with the patient. A relationship formed through face-to-face interaction can improve patient understanding of education, compliance and family involvement (Gallagher-Lepak et al., 2009). Gallagher-Lepak et al., (2009) suggests forming a relationship with the patient prior to
involving telehealth if possible. The combination of face-to-face visits and telehealth visits would best serve the patient, family, and provider (Gallagher-Lepak et al., 2009). The participants also shared that older adults may be apprehensive about utilizing telehealth. They stressed the importance of recognizing patients who would embrace telehealth and those who would not appreciate the technology. There is a need for a balance between the desire for ongoing face-to-face relationships and the reality of patient care. High transportation costs, uneven access to specialized health care, and lengthy time investment on the part of patients and health care professionals are a reality of both receiving and providing care (Gallagher-Lepak et al., 2009).

Additionally, many of the participants felt wary of adding telehealth education to the DNP curriculum. Multiple participants expressed concern regarding the addition of telehealth education to the DNP curriculum because it could replace important content that they are interested in. Nursing graduate programs consist of an extensive curriculum that may have limited room for telehealth content (Ali, 2015). However, according to Ali (2015), barriers regarding incorporation of telehealth into nursing curricula can be resolved. Integration of telehealth does not need to involve a massive curriculum revision. Faculty can examine their curricula and identify where telehealth concepts can be incorporated, explore institutional resources related to telehealth, consider linking with other disciplines and clinical agencies that are already implementing telehealth, and discuss with faculty who have already implemented telehealth education in their nursing programs (Ali, 2015).

The specific aims initially mentioned guided the investigators as they completed the project. The first specific aim of the project was: how can UB maximize utilization of telehealth equipment available for use? The participants revealed that the best utilization of the telehealth
units would be to conduct a simulation experience with other interdisciplinary professional students. The second specific aim of the project was: will resistance be met from current students while regarding the use of telehealth in the DNP program? The investigators did meet resistance from the participants regarding incorporating telehealth education into the DNP curriculum. The participants were wary of involving telehealth education into the DNP curriculum because they feared it would replace vital information they are interested in learning. Finally, the third specific aim of the project was: how will the competencies created influence future DNP programs and their use of telehealth including maximization of telehealth equipment use? The competencies that have been created through this project will aid in maximizing telehealth equipment use and will need to be tested further to determine the best method to incorporate telehealth into the DNP curriculum.

**Limitations**

Although the focus group yielded valuable data in regards to telehealth education, there were limitations to the project. The project consisted of a focus group, and due to the small sample size of focus groups, they are not thought to be a good representation of the general population (Leung & Savithiri, 2009). This indicates that the focus group results may not be transferrable across all populations of DNP students.

Despite recruitment methods, the investigators were only able to recruit five participants in the initial focus group. The optimum size of a focus group is six to eight participants (Gill, Stewart, Treasure, & Chadwick, 2008). Although this is the ideal number, focus groups can still run successfully with as few as three participants and as many as fourteen participants (Gill et al., 2008). Due to the fact that only five participants responded, the investigators had to hold an
individual interview to obtain additional feedback. Another limitation to the project was the fact that the participants were a homogenous sample. All five participants were female students in the NGC 799 course between the ages of twenty and thirty.

Since the participants were recruited from the NGC 799 course they all knew one another prior to arriving at the focus group. According to Pawi, Putit, & Bucanan (2010) focus groups can be enhanced through anonymity because participants may feel more comfortable facilitating a free dialogue for discussion if they aren’t familiar with one another. Additionally, the participants were only introduced to one telehealth unit throughout the course of the project. Although the investigators did provide education about different telehealth methods during the in-service, the students only had hands on experience with the transportable examination station that is available at the University at Buffalo. There are multiple other forms of telehealth technologies that are being used currently and it may have strengthened the project if participants were able to have direct contact with several forms, rather than just one.

**Strengths**

The project had its limitations, but there were also several strengths that the investigators noted throughout the duration of the project. The investigators had difficulty recruiting subjects and as a result they included an individual interview, which ultimately ended up strengthening the project. Interviews are an effective way for getting people to discuss their personal feelings, opinions, and experiences (Milena, Dainora, & Alin, 2008). The combination of the focus group and individual interview allowed for different viewpoints and the generation of more data.

Another strength to the project was the fact that not one person dominated the discussion during the focus group. All members of the focus group participated allowing several
viewpoints to emerge throughout the conversation. The focus group members were all current students in the DNP program at the University at Buffalo, which increased their engagement in future educational practices. The participants were aware of current educational practices at UB and have shared experiences in education with one another over the course of their education. This encouraged the participants to remain active and engaged in the focus group discussion.

Finally, the participants were members of the NGC 799 course, indicating that they were in their final year of the DNP program. They have been exposed to all aspects of DNP education during their first few years as students. As seniors in the doctoral program they understand the present curriculum and how telehealth could best be incorporated. This allowed the participants to provide realistic examples and ideas for future improvements in telehealth education.

**Future Implications**

The themes that arose throughout the course of the project indicate several opportunities for future research. The project revealed that students have an interest in incorporating telehealth education into the DNP curriculum, but there needs to be further research in regards to which method of education would best prepare students to utilize telehealth in practice. The participants came up with multiple methods for incorporating telehealth into the DNP education including a simulation experience, physical examination course, and including telehealth in the informatics course at the University at Buffalo. Future research and potential piloting of these forms of education would determine which method is most effective.

Participants suggested that future DNP students at UB could pilot a telehealth simulation experience to determine if it would allow students to meet the telehealth competencies developed throughout the course of this project. In the simulation experience the students would be able to use the telehealth units to provide care and consult other specialties via the videoconferencing
capabilities. UB has a medical, dental, pharmacy, and nursing program that could be available for consultation utilizing the telehealth units.

The investigators specifically laid out the methods for this project so that it could be repeated in another DNP program to determine if other students at the doctorate level feel that telehealth education is necessary at their university. The topic of telehealth education should be further explored at other programs to evaluate students’ thoughts and feelings on incorporating telehealth into the curriculum. A more diverse sampling of students in future research could improve the generalizability of the data allowing the information to be shared and implemented into curriculums of multiple doctoral programs.
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http://nursing.buffalo.edu/content/dam/nursing/PDFs/StudentForms/Handbook_Graduate.pdf

Figure A. Bloom’s Taxonomy. Reprinted from Journal of Medical Library Association, by N. Adams, 2015 Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4511057/

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<table>
<thead>
<tr>
<th>Competencies for Integrating Telehealth into DNP Education</th>
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<tbody>
<tr>
<td>1. Student can determine appropriate use for health information technologies to improve patient care</td>
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<tr>
<td>2. Student can identify the applications of telehealth in clinical settings.</td>
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<tr>
<td>3. Student monitors a patient via technological instruments of the telehealth unit. Student demonstrates the ability to record vital signs and glucometer reading with telehealth unit.</td>
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<tr>
<td>4. Student recognizes the necessity and demonstrates the ability to protect patient privacy while using telehealth and health information technology.</td>
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<tr>
<td>5. Student is able to distinguish situations in which telehealth technology would be the most appropriate technique to provide patient care and improve patient outcomes.</td>
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<tr>
<td>6. Student displays mastery of telehealth unit through the use of a simulation experience</td>
</tr>
<tr>
<td>7. Student can effectively use telehealth unit to consult other interdisciplinary team members to improve patient care.</td>
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Appendix A. Student Information Sheet

Introduction

You are invited to participate in an educational experience as part of a capstone project entitled “Improving Education for Advance Practice Nurses (APNs): Developing Competencies for Telehealth Education.” This project is being conducted by Nora Balon & Ellen Duane under the assistance of Tammy Austin-Ketch, PhD, FNP-BC, FAANP and Pamela Paplham, DNP, AOCNP, FNP-BC, FAANP through the University at Buffalo School of Nursing. The educational experience will involve a one-hour in-service on telehealth equipment, followed by a one hour hands-on experience with the telehealth equipment. If you participate in the two educational sessions, you will be invited to take part in a focus group to discuss the experiences. This project is intended for University at Buffalo School of Nursing Bachelor of Science to Doctor of Nursing Practice-Family Nurse Practitioner (BS-DNP, FNP) students who are enrolled in DNP Capstone Course II (NCG 799), with little or no experience with telehealth. If you are not a University at Buffalo BS–DNP, FNP student, have experience with telehealth or are not enrolled in DNP Capstone Course II (NGC 799) during the Fall 2017 semester at the University at Buffalo, please do not participate in this project.

Purpose

The purpose of this project is to develop culturally sensitive and specific competencies to advance telehealth education for APN students that can be integrated into the current curriculum at the University at Buffalo. The endpoint of this project is to improve telehealth education for APN students at the University at Buffalo.

Procedure

The hands-on experience will involve a situation where the investigators can guide you through the utilization of the telehealth equipment. The focus group will be comprised of questions relating to your thoughts and feelings regarding the educational experience.

The focus group will be audio-recorded, using two hand held audio recorders in order to collect the data. Additionally one investigator will take notes during the focus group.

Volunteer Status

Your participation in this project is completely voluntary. If you participate in this project, you have the right to refuse to answer any question during the focus group. Withdrawal from the project is permitted at any time throughout the duration of the project. Refusal to participate in this project will have no affect on your status in NGC 799.

Confidentiality

By participating in the focus group you are giving implied consent that investigators can use data you contribute during the project. All responses will be reported as aggregate or grouped data. The data collected is not recorded in any way that can associate a name with the participant.
The notes taken during the focus group will not record any personal identifiers. It is imperative that you do not reveal any personal information regarding yourself or others during the focus group. Data will be kept in a locked cabinet and on the investigators password protected laptops. The data will only be shown to UB faculty when necessary. The information shared during the focus group should remain confidential.

By attending the focus group you are consenting to participate in this project.

For further information about this project you may contact:

Nora Balon: nebalon@buffalo.edu, (716) 440-4978
Ellen Duane: ellendra@buffalo.edu, (716) 982-9404
Tammy Austin-Ketch: tlak@buffalo.edu, (716)-829- 2140
Pamela Paplham: pamelafr@buffalo.edu, (716)-829- 3225
November 4, 2017

Dear ELLEN DUANE,

On 11/4/2017, the University at Buffalo IRB reviewed the following submission:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Initial Study</th>
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<tbody>
<tr>
<td>Title of Study:</td>
<td>Improving Education for Advance Practice Nurses (APNs): Developing Competencies for Telehealth Education</td>
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<tr>
<td>Investigator:</td>
<td>ELLEN DUANE</td>
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<tr>
<td>IRB ID:</td>
<td>STUDY00001868</td>
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<tr>
<td>Funding:</td>
<td>None</td>
</tr>
<tr>
<td>Grant ID:</td>
<td>None</td>
</tr>
<tr>
<td>IND, IDE, or HDE:</td>
<td>None</td>
</tr>
<tr>
<td>Documents Reviewed:</td>
<td>• Student Recruitment Form.pdf, Category: Recruitment Materials;</td>
</tr>
<tr>
<td></td>
<td>• focus group questions.docx, Category: Surveys/Questionnaires;</td>
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<tr>
<td></td>
<td>• Balon, Duane Script for Consent.pdf, Category: Consent Form;</td>
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<tr>
<td></td>
<td>• Balon, Duane IRB 5.docx, Category: IRB Protocol;</td>
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</tbody>
</table>

The University at Buffalo Institutional Review Board has considered the submission for the project referenced above on 11/4/2017 and determined it to be Exempt.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the Click system.

UBIRB exemption is given with the understanding that the most recently approved procedures will be followed and the most recently approved consenting documents will be used. If modifications are needed that may change the exemption determination, please contact the UB IRB Office. Also, see the Worksheet: Exempt Determination (HRP-312) for information on exemption criteria and categories.

As principal investigator for this study involving human participants, you have responsibilities to the SUNY University at Buffalo IRB (UBIRB) as follows:

1. Ensuring that no subjects are enrolled prior to the IRB approval date.

2. Ensuring that the UBIRB is notified of:
3. Ensuring that the protocol is followed as approved by UBIRB unless minor changes that do not impact the exempt determination are made.

4. Ensuring that the study is conducted in compliance with all UBIRB decisions, conditions, and requirements.

5. Bearing responsibility for all actions of the staff and sub-investigators with regard to the protocol.

6. Bearing responsibility for securing any other required approvals before research begins.

If you have any questions, please contact the UBIRB at 716-888-4888 or ub-irb@buffalo.edu.
The purpose of this capstone project is to identify culturally sensitive and specific competencies to improve telehealth education for DNP students.

- APNs are expected to use telehealth to provide care, but their limited exposure throughout their education interferes with their ability to use telehealth (Rutledge, Haney, Bordelon, Renaud & Fowler, 2014).

**Capstone Questions**

**PICO Question:**

- **P:** BS to DNP, FNP Students
- **I:** Identify and develop telehealth competencies for BS to DNP, FNP students
- **C:** Traditional education
- **O:** Using culturally sensitive and specific competencies to improve telehealth education for DNP students

**Specific Aims**

1. How can UB maximize utilization of telehealth equipment available for use?
2. Will resistance be met from current students regarding the use of telehealth in the DNP program?
3. How will the competencies created influence the future DNP program and their use of telehealth, including maximization of telehealth equipment use?
Search Strategy

• The project investigators conducted an extensive review of literature in order to assess the current utilization of telehealth.
• The database PubMed was utilized for the literature search since it consists of biomedical literature plus the MEDLINE database.
• The first search completed returned 161 articles that the researchers reviewed.
• Articles published prior to 2005 were excluded.
• After a review of all the articles, 23 articles were included in the review of literature.

Background & Significance

• The technologies involved in telehealth include videoconferencing, exchanging medical information via electronic communications, remote patient monitoring, population health management and mobile health technologies (Henderson, Davis, Smith & King, 2014).
• Telehealth is an evolving field that holds the potential to improve patient outcomes by increasing access to care regardless of geographic location (Reed, 2005).
• Telehealth can be used to complement existing healthcare networks by bringing services to those who might not otherwise receive care (Reed, 2005).

Background & Significance

• Telehealth increases access to care, improves outcomes, reduces costs, and enables resources to be better used (Gardner, Rutledge, & Gray, 2015).
• The financial impact of a telehealth program on a hospital or other clinical entity can be assessed in a number of ways such as the ability to retain patients admitted in the community hospital (avoiding unnecessary transfer of patients), a reduction in medical staffing costs (shared resources), an added medical service line, a decrease in the length of hospital admission, and the prevention of a financial penalty from hospital readmissions (Henderson et al., 2014).
• The use of telehealth technologies increases patient satisfaction, improves outcomes, allows for improved work efficiency, and enhances the ability to establish and maintain sufficient improved collaboration between patient, provider, and other healthcare team members (Gervera & Graves, 2015).
• Telehealth has allowed providers to deliver patient education, assess for changes in patient status, and provide interventions related to the patient’s condition, while the patient remains at home (Gallagher-Lepack, Schofer, & Gibson, 2009; Sevean et al., 2008).
• Overall, the use of telehealth supports the Institute of Medicine’s aims of safe, effective, patient centered, timely, efficient, and equitable care of patients (Nemers et al., 2009).
Background & Significance

• The American Nurses Association (ANA) recognizes telehealth as being within the scope of nursing practice (Sevean et al., 2008).

• The American Association of Colleges of Nursing (AACN) developed eight essential areas of curricular content, one of which is information systems/technology and patient care technology for improvement and transformation of health care (Choi & Zucker, 2013).

• Several key policy statements and professional standards have emphasized the importance of the use of technology to improve patient outcomes (L’Esperance & Perry, 2016).

• Based on the goals of health care reform, the growth in the demand for health care will continue to increase the demand for physicians and, as physician shortages widen, advanced practice nurses (APNs) and physician assistants (PAs) will play larger roles (Sargen, Hooker, & Cooper, 2011).

• If training programs for APNs and PAs grow as currently projected, the supply of advance clinicians is expected to be 20% less than the demand in 2025 (Sargen et al., 2011).

• The nurse workforce shortage, coupled with a growing need for faculty, calls for redesign, restructuring, and recognition that the flexibility and availability of technology offer nursing education drastic opportunities for innovation (Neuman, 2006).

• Incorporating telehealth into APN education will not only improve their comfort with telehealth after graduation, it also has the potential to open up new opportunities in regards to the limited number of clinical sites and faculty shortages.

• Telehealth can be used to facilitate communication among faculty, students, and preceptors at clinical sites and to conduct clinical visits to evaluate student performances and clinical instructor effectiveness (Grady, 2011).

• The use of telehealth as an educational tool could allow faculty to train more APN students to meet the growing demands that we face in years to come.

• Studies conducted that allowed for APN students to receive telehealth training have illustrated that training improves their comfort level with technologies and allows students to better understand the benefits of using telehealth (Estes et al., 2016; Rutledge et al., 2014).

• Estes et al., (2016) conducted a study that introduced APN and Doctor of Pharmacy students to telehealth technology in a simulated interprofessional environment.

• A telehealth study conducted by Rutledge et al., (2014) involved the education of APN students through a telehealth simulation workshop, a simulated face-to-face visit and simulated telehealth visit, a telehealth immersion experience, and a telehealth project.
Background & Significance

- In order to be prepared for a role in today’s health care systems, nurse practitioner students need to be prepared to use telehealth in providing patient care, however there are few examples of graduate nursing programs that teach students how to use telehealth in delivering health care services (Erickson, Fauchland & Ideker, 2015).

- An opportunity exists to develop curriculum that provides a chance for nurses to shape education to prepare the profession for leadership in the development of technology-enhanced practice (Erickson et al., 2015).

- Advances in technology-enhanced education have the capacity to revolutionize the traditional nursing curriculum (Grady, 2011).

Background & Significance

- Although telehealth has been a promising healthcare technology, very little literature exists regarding proper telehealth etiquette (Haney et al., 2015).

- Telehealth etiquette includes unique behaviors beyond the typical professional behaviors that result in an effective telehealth visit, or more importantly prevent a substandard telehealth visit (Haney et al., 2015).

- Strategies such as listening, honesty, competency, and empowerment should be included into future telehealth education (Varghese & Phillips, 2009).

- Health disparities exist in rural populations due to the lack of adequate provider coverage (Rutledge et al., 2014). Providers that practice in the rural setting are overloaded with patients, making it difficult for them to provide comprehensive care.

- A needs assessment conducted by Dr. Austin-Ketch at the University at Buffalo (UB) indicated that many Native American patients in this rural setting voiced a need for counseling or additional information on aspects of care related to chronic medical and mental health concerns (Austin-Ketch, 2016).

- It is clear that telehealth is on the forefront of healthcare provision, indicating the need for telehealth education in the nursing curriculum.

Bloom’s Taxonomy

- Bloom’s taxonomy is an educational model comprised of six categories within the cognitive domain that range from lower-level cognitive skills, to higher-order cognitive skills (Bouchard, 2011; Slancy, 2016).

- Bloom’s taxonomy incorporates higher levels of education, compelling students to embrace more challenging concepts.

- According to Kanter (2014) higher order thinking in Bloom’s taxonomy includes analysis, synthesis, and evaluation. The use of learning activities that promote higher levels of learning facilitate student achievement of skills that are necessary to be successful following graduation (Ahmed, Anwar, Ukaahhah, Ilisu, & Anwan, 2014 ).
Bloom’s Taxonomy

- The use of Bloom’s taxonomy of learning assisted in the development of competencies by incorporating a higher order of thinking into telehealth education.
- By creating competencies that relate to the lower-level understanding of telehealth, and the higher-level utilization of telehealth, the DNP students should acquire a comprehensive knowledge of telehealth.
- Researchers Ugur, Constantinescu, & Stevens (2015) described and designed a school-based curriculum that integrated Bloom’s taxonomy in order to facilitate student self-development. They discovered that incorporating cognitive learning into the curriculum yielded favorable student outcomes.

Methods: Study Design

- The capstone project utilized qualitative research methods to obtain participant feedback.
- To begin the project, investigators held an educational session to allow project participants to gain familiarity with telehealth units.
- The educational session consisted of a one-hour in service on the telehealth equipment and one-hour of hands on experience.
- Following the educational session, data collection was conducted through the use of a focus group and individual interview to obtain the participant’s thoughts and experiences.

Methods: Setting & Sample

- The capstone project took place at the University at Buffalo from the fall of 2017 to the spring of 2018.
- The educational session and focus group took place in a private room in Wende Hall.
- The participant population included current BS to FNP, DNP students who were enrolled in the NGC 799 class.
- The investigators aimed to have six to twelve participants. They recruited participants in the fall of 2017.

Methods: Study Design

- Individual interviews are the most widely used data collection strategy in qualitative research (Lambert & Losielle, 2008).
- Focus groups are typically composed of six to twelve participants and a trained moderator with the purpose of learning more about attitudes and opinions on a given topic (Massey, 2011).
- Data obtained from focus groups can provide the richest form of qualitative data for analysis, but it is also at highest risk for misapplication and misinterpretation (Massey, 2011).
- Focus groups and individual interviews are two different methods of obtaining qualitative data, but their combination can provide an advantage to researchers as additional views of the phenomenon may be generated (Lambert & Losielle, 2008).
Methods: Data Collection & Analysis

- Following the focus group and individual interview the audio recording was transcribed in order to vigorously review the data.
- Once the audio recording was transcribed the process of coding began to interpret the data.
- The investigators performed multiple cycles of coding to ensure that they extracted significant evidence from the data. Through the process of coding, the investigators generated common themes and concepts.

Methods: Ethical Considerations

- In regards to ethical considerations that impacted the project, it was imperative to inform the student participants that the project had absolutely no regard to their current status at UB.
- Another ethical concern in the project was confidentiality. It is not always possible to protect confidentiality in a focus group; as people discuss and interact, they are disclosing information that could be private or personal.
- The investigators obtained verbal consent from the students prior to the focus group, the participants also consented to be audio recorded during the focus group.

Methods

Strategies to Ensure Rigor:

- Clearly describing the roles of each researcher in the project.
- Deriving study procedures from clearly outlined research questions and conceptual theory so that data analysis can be tied back to theoretical constructs (Coburn & Evans, 2016).
- Developing a coding reference prior to data analysis, containing codes derived from theoretical framework and relevant literature (Coburn & Evans, 2016).
- In keeping with qualitative tradition, data analysis and collection occurred simultaneously, giving the investigators the opportunity to correct errors and make revisions (Coburn & Evans, 2016).

Results

- Both a focus group and an individual interview were held to obtain appropriate feedback for the thematic analysis.
- The focus group (N=6) took place on Thursday November 30th 2017 at two o’clock in the afternoon following a two-hour educational session with all five participants.
- The interview took place on Wednesday January 24th 2018 at twelve thirty in the afternoon.
- The individual received the same informative session as the focus group and their feedback was obtained following the education.
Results

• The project participants were a homogenous sample; all six participants were females between the ages of twenty and thirty years of age.

• Both investigators were present during the focus group and the individual interview.

• One investigator led the discussion at both the interview and focus group, while the other investigator took detailed notes.

Results

• The focus group and individual interview were audio recorded and downloaded to the investigators’ personal password protected laptops.

• Each investigator transcribed the audio recordings verbatim.

• The transcripts were analyzed thematically by both investigators to search for common themes amongst the data using the guidelines developed by Braun and Clarke (2006).

Thematic Analysis

Several themes emerged from the coded data that can be broken down into four main categories.

1) Benefits of telehealth use:

• The participants mentioned that telehealth could be especially beneficial to hospitals in rural areas with limited resources in terms of specialty providers.

• Telehealth could improve the triage process by determining, through the use of video conferencing, if patients could be managed in the rural setting or if they needed to be transported to a higher level of care.

• Participants also mentioned that telehealth could allow nurse practitioners to fill the gap in primary care.

Thematic Analysis

• 2) Limitations of telehealth use:

• Several participants voiced concern that telehealth could represent a barrier in certain clinical settings.

• Participants reported technical difficulties could arise when using the telehealth units.

• The participants were apprehensive about utilizing telehealth since there is often information they do not want to share in front of the patient.
Thematic Analysis

• 3) Current knowledge of telehealth and need for telehealth education in the DNP curriculum:
  • Participants state the current educational practices are minimal, reporting it to be "brushed over" and included "no formal training."
  • They were troubled that the DNP program already has an emphasis on research, and the addition of telehealth could minimize therapeutic education.
  • The participants shared that they would not want a telehealth experience in lieu of clinical experience.

• 4) Interest in the future of telehealth:
  • Participants recognized that telehealth will be "blossoming" in the very near future, and as students it is necessary for them to build familiarity with technology.
  • Participants also voiced that a simulation experience would be a beneficial method for incorporating telehealth into the curriculum.
  • Regardless of the way telehealth is incorporated into future education, there is a need for hands-on experience with telehealth education.

Competencies for Telehealth Education

Competencies for Integrating Telehealth into DNP Education

<table>
<thead>
<tr>
<th>Competencies for Integrating Telehealth into DNP Education</th>
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<tbody>
<tr>
<td>1. Student can determine appropriate use for health information technologies to improve patient care.</td>
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<tr>
<td>2. Student can identify the applications of telehealth in clinical settings.</td>
</tr>
<tr>
<td>3. Student monitors a patient via technological instruments of the telehealth unit. Student demonstrates the ability to record vital signs and glucometer reading with telehealth unit.</td>
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<tr>
<td>4. Student recognizes the necessity and demonstrates the ability to protect patient privacy while using telehealth and health information technology.</td>
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<tr>
<td>5. Student is able to diagnose situations in which telehealth technology would be the most appropriate technique to provide patient care and improve patient outcomes.</td>
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<tr>
<td>6. Student displays mastery of telehealth unit through the use of a simulation experience.</td>
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<tr>
<td>7. Student can effectively use telehealth and to consult other interdisciplinary team members to improve patient care.</td>
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</table>

Future Implications

• The project revealed that students have an interest in incorporating telehealth education into the DNP curriculum, but further research is needed regarding which method of education would best prepare students to utilize telehealth in practice.
• Participants suggested that future DNP students at UB could pilot a telehealth simulation experience to determine if it would allow students to meet the telehealth competencies developed throughout the course of this project.
• The investigators specifically laid out the methods for this project so that it could be repeated in another DNP program to determine if other students at the doctorate level feel that telehealth education is necessary at their university.
Limitations

- The project consisted of a focus group, and due to the small sample size of focus groups, they are not thought to be a good representation of the general population (Leung & Savithiri, 2009).
- Despite recruitment methods the investigators were only able to recruit five participants in the initial focus group.
- Another limitation to the project was the fact that the participants were a homogenous sample.
- Additionally, the participants were only introduced to one telehealth unit throughout the course of the project.

Strengths

- The combination of the focus group and individual interview allowed for different viewpoints and the generation of more data.
- The focus group discussion was not dominated by one participant, instead all members shared their viewpoints.
- The participants were aware of current educational practices at UB and had shared experiences in education.
- The participants were all seniors in the doctoral program and had an understanding of the current curriculum.

Project Contribution

- Reevaluation of DNP curriculum is needed to ensure that graduates have the ability to practice at the most advanced level of nursing (Brown & Crabtree, 2013).
- Incorporating innovative technology into the curriculum is recommended in the essentials outlined by the AACN.
- The AACN suggests that doctoral level programs must develop innovative competencies for the increasingly complex practice of advance practice nursing (American Association of Colleges of Nursing [AACN], 2006).
- This project developed competencies for incorporating progressive technology such as telehealth into the DNP curriculum.

References

References


References


