DNP Forum

Volume 1 | Issue 1 Article 2

2015

Introducing Telehealth to Pre-licensure Nursing Students

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Abstract

Background

Telehealth has emerged as an important tool for healthcare providers. Telehealth concepts are not currently taught in many nursing courses.

Purpose

Introduce telehealth concepts to pre-licensure nursing students via a learning module and to test its effectiveness using pre and post-tests.

Method

A two-tailed *t* test used to analyze the difference between the pre and post-test scores supported the research question: “Is the use of a new telehealth learning module effective in teaching pre-licensure nursing students about telehealth?”

Multiple regression analysis demonstrated that demographic variables had no influence on the outcome of either test.

Discussion

The results of the statistical analysis suggest the module is an effective learning tool.

Conclusion

Telehealth is becoming a useful tool in caring for patients, especially those with chronic illnesses. Introducing the concepts of telehealth in a nursing curriculum will increase students’ awareness of its use in the nursing field.

Keywords

Telehealth Pre-Licensure Nursing Students

The Importance of Using Telehealth

Telehealth is "the use of electronic information and telecommunications technologies to support long-distance clinical health care, patient and professional health-related education and training, public health and health administration" (Bedi & Murphy, 2003, p. 11).

Bedi and Murphy (2003) discussed other uses of telehealth. The technology can be used to send information to a client's electronic medical record (EMR). Some systems use a "store and forward" method, which allows data to be captured and sent to a healthcare provider at set intervals or upon demand. Other systems use real-time transmissions of information which makes data available to a healthcare provider as soon as the data is captured.

Telehealth is becoming an increasing method for delivering client care. The American Telemedicine Association (2010) has identified six ways in which the Obama administration can improve health care delivery through telemedicine, including increased funding for new projects. The University of Texas Medical Branch, one of the nation's leading telehealth providers has approximately 119,364 patient encounters in 2015(UTMB Intranet Document 2- 2015). Approximately five percent of the US population account for nearly half of the total spending on health care. These people have complex medical problems, including difficult-to-manage diseases like diabetes, heart failure and mental illness. Chronically ill people are hospitalized more often, take a larger amount of prescription medications and undergo more procedures than others in the population according to the Commonwealth Fund (2013). Telehealth can assist in this area by providing a virtual in-home visit, thereby reducing the patient's associated costs of travel to a physician's office, decreasing hospitalizations and the associated costs for both.

Significance of the problem

Among the goals for *Healthy People 2020* (Department of Health and Human Services (2010) is integrating more information technology into health care. One of the ways this is done is to make sure that health profession students are aware of the benefits and uses of telehealth technology. Auerswald (2015) found that home health care using existing technologies has resulted in as much as 15-30% cost savings compared with hospital based care systems. This translates to $200 over 25 years using telehealth. A comprehensive literature review, however, has revealed few resources that discussed teaching the concepts of telehealth to pre-licensure nursing students or licensed nurses.

Benefits of using telehealth

It is important for nurses to understand how telehealth technology can strengthen their role in assisting physicians and clients by providing accurate information in an efficient and economic manner to the healthcare provider. According to the American Telehealth Association (2011), in-home telehealth services permits closer monitoring of clients either by calling them through a telephone or by use of a computer, soliciting and recording information such as vital signs, weight, and oxygen saturation levels and other assessment parameters. The Center for Connected Health Policy (2014) indicates that telehealth monitoring can be synchronous such as those that use a monitor screen where there is interaction between the client and the health care provider or by store and forward systems (asynchronous), gathering information that is retrieved and then transmitted to the provider or to the client's electronic medical record at specific intervals throughout the day. Remote client monitoring permits data gathering from clients while they are at home or another location and the information can be transmitted immediately or through store and forwarding. Some computer-based systems are capable of reminding clients

when it is time to take medications. Through the use of pre-set algorithms, systems can monitor such variables as food, water, sodium intake, and pain levels. When these pre-set parameters are exceeded, healthcare workers are notified and appropriate interventions may be taken, possibly eliminating the need for the clients to receive a home health visit, visit their local emergency room or risk being readmitted to the hospital for an exacerbation of a disease process.

Purpose of the study

The purpose of the study was to evaluate the effectiveness of a learning module that introduced the concepts of telehealth to pre-licensure nursing students. The module discussed ways of using telehealth, analyzed situations where telehealth would be of value, and advantages versus disadvantages of using telehealth.

Research Question

Is the use of a new telehealth learning module effective in teaching pre-licensure nursing students about telehealth?

Research design

The study used a one-group pre-test/post-test design. The sample was drawn from a pool of pre-licensure nursing students at a community college. A review of the college's nursing course syllabi indicated telehealth was not included in the curriculum. A module containing this content was developed by the author and subsequently presented to the students during a face-to-face meeting specifically set for this study.

The pre-test was administered at the beginning of the study session. The students then completed the module in the classroom. The post-test was administered one week later in the same classroom. The rationale behind waiting one week was to investigate if the students retained the information presented in the module, as opposed to immediate recall. The course

module was designed using Kolb's Experiential Learning Theory (1984) in order to encompass several different student learning styles. The module's learning objectives were to: 1) define telehealth; 2) explain uses for telehealth**;** 3) list information that can be transmitted via telehealth device/system; 4) describe the components that make up a telehealth system; 5) discuss the nurse's responsibility using telehealth; 6) assess when telehealth would be an appropriate venue for a client; 7) discuss the advantages and the disadvantages of using telehealth; 8) differentiate between telehealth and telemedicine**;** 9) discuss the nurse's role in telehealth monitoring; 10) analyze the regulations and practice resources that govern the use of telehealth; and 11) compare/contrast between three different telehealth systems; in-home device systems, telephone based systems, and hospital based systems.

Telehealth Learning Module

A learning module was created using a combined PowerPoint, audio-lecture format. The content for the lecture and PowerPoint was derived from (Bosh, 2011; Darkins & Cary, 2000; McGonigle & Mastrian 2009, Sewell & Thede, 2013; Telehealth 360).

Once the lecture and PowerPoint were created, pre- and post-tests were designed to assess the students' knowledge about telehealth before and after completing the learning module. The content of the pre- and post-tests was reviewed by a panel of faculty experts, one of who has been a nurse educator for 25 years and one who is the executive director of the AT&T Center for Telehealth Research and Policy at UTMB. The module was reviewed as well by the same panel. The community college where the project was carried out did not have an IRB committee, so written permission was obtained from the president to use the college as the study site. In addition, IRB approval was obtained through the university where the author was a student.

Target Participants

A convenience sample of thirty pre-licensure students attending a community college in Southeast Texas was used for this study (n=30). The participants were all students enrolled in senior-level medical-surgical nursing class that is part of the curricula required to obtain a registered nurse's license.

The inclusion criteria for the project were that all participants had to be: 1) enrolled in a medical-surgical nursing course; 2) at least 18 years of age; 3) free of all audio or visual problems and able to speak, read, and write English. Exclusion criteria included any person who had worked with telehealth in the past, who had prior knowledge about telehealth, or who was a client who had used telehealth. Demographic information obtained from the participants included age, education level, gender, race, and previously obtained degrees.

Setting

The project took place in a college classroom in Southeast Texas. The classroom had sufficient seating and the classroom environment was controlled for lighting, temperature and noise. During the demographics questionnaire, pre-test, module and post-test, the participants were not allowed to leave the classroom.

Procedure Steps

1. Informed consent was obtained from the students one week prior to the intervention.
2. Before the students entered to take the pre-test on the designated day, numbers were assigned to every other seat in the room. The students were allowed to sit randomly in those seats, but were told to write the number of their chair on the demographic questionnaire and on the pre-test. The primary investigator (PI) wrote down on a list the first initial and last name of the

students taking the pre-test along with their corresponding seat number on the questionnaire and pre-test.

3. The demographics questionnaire was administered first and then collected. The pre-test was then administered to the students. The pre-test and demographics questionnaire took no more than 50 minutes to administer.

4. At the conclusion of the pre-test, the PI showed the telehealth instruction module, which lasted 45 minutes.

5. The pre-test, demographic data, and list of names were kept in a secure location (a locked file cabinet to which the PI did not have access) by the administrative assistant in the nursing department.

6. One week after the telehealth module was presented, the students were given the post-test having the same number attached to it as the pre-test and demographic data. The seating arrangement was copied as in the pre-test and module, and the students were identified from the list of names and numbers collected during the pre-test. The post-test was administered in the same classroom as the pre-test and the results kept in the same secure location as the pre-test and demographic data.

7. The pre-test and post-test were scored using Scantron software and the tests were subjected to item analysis.

Results

A total of seven (23%) of the original thirty students did not complete the study. Five of the students withdrew for personal reasons; two were excluded because they did not complete the post-test. The age range was 18-60, with an average age of 25; there were seven males (30.43%), and 16 females (69.56%). The majority had attended school between 14 and 16 years.

All participants had a least a high school diploma with eight having obtained a previous Associates Degree. There were two African Americans (8.69%), eleven non-Hispanic whites (47.8%), two Asians (8.69%), two Native Americans (8.69 %), and six Hispanics (26.08%).

Statistical analysis

A within-sample 2 tailed paired t-test of significance was used in the analysis of the pre- and post-test scores (t=(22), p<.01, pre-test mean score 16.04 with a standard deviation of 2.63, and a post-test mean score of 19.13 with a standard deviation of 2.66, n=23). The results supported the proposition that the use of a new telehealth learning module was effective in teaching pre-licensure nursing students about telehealth, as scores increased significantly post-test.

A multiple-regression analysis was performed on the demographic data compared against the pre-and post-test scores. No significant factors were found.

Discussion

The learning module itself was an effective means of imparting basic knowledge about telehealth and the nurse's role in its use in this setting. To further investigate the effectiveness of the module, it would need to be presented to a wider audience of pre-licensure nursing students. If the module continues to demonstrate effectiveness, it can be published and made available to other nursing schools.

Because the module is part of a pilot study as are the measurements (the pre- and post-test), validity and reliability of the tests have not been established. In order for this to happen, the module, along with the tests, would have to be presented in multiple settings. The sample size although adequate, was small (n=23).

Recommendations

To further study this module and the findings of this study, the module should be made available to several groups of students in different types of pre-licensure programs.

Alignment of DNP Essentials

This project supports, according to Chism (2010), Essential IV, Information Systems/Technology and Patient Care Technology for Improvement and Transformation of Health Care. The project module introduces pre-licensure nursing students to the basic concepts of telehealth and their role as nurses in using information technology. The project was designed to fill in an information gap in nursing education regarding this form of health care delivery system. The role of an advanced practice nurse as an educator is to be familiar with the use of various healthcare delivery systems and to educate others about those systems. The lack of literature regarding educating pre-licensure nursing students on what telehealth is and how it is used lead to the creation of this module.

Conclusion

As the need grows for frequent monitoring of clients with chronic conditions to help decrease hospital readmission rates, client and insurance costs, and improve client outcomes, more nurses will be needed that have a foundational knowledge of telehealth. Because of the increased use of telehealth, educating nurses about its use could be beneficial; beginning the education process in nursing school exposes the student to this form of healthcare delivery. Incorporating this learning module would be a way to address one gap in nursing education.

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