

Utilizing Technology to Improve Patient Comprehension

Christina Williams, DNP, APRN, FNP-BC
Mississippi University for Women

Department of Graduate Nursing
Columbus, Mississippi

Correspondence concerning this project should be addressed to Christina Williams.

Contact: clswilliams@hotmail.com

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Utilizing Technology to Improve Patient Comprehension

Patient comprehension of discharge instructions is a cornerstone for successful health care. If a healthy outcome is to be achieved, the patient needs to comprehend the discharge instructions that are given by the healthcare provider. Healthcare providers are required by Joint Commission Hospital Accreditation to provide effective discharge instructions. In the clinic setting, meaningful use also has the same regulations. There are no standards for assessing patient comprehension for patient education (Alberti & Nannini, 2013).

Patients in an acute care setting have difficulty with recollection and overall comprehension of discharge instructions. In the urgent care setting, other factors may affect patient comprehension of patient education including illness of the patient, fast pace of surroundings, or acute trauma of patient or family member. There is a need for evaluation of the comprehension of education to make adjustments that could improve patient outcomes and self-care. With the rise of mobile devices and the Internet usage for health and patient education, an educational tool using informatics would be an ideal development. The use of a standardized video related to the specific diagnosis, provided the patients with proper discharge teaching. The videos could be accessed by the patient after discharge via the Internet as a reference teaching tool. The videos were shown in the clinic, and a survey given to the patients to assess comprehension of discharge teaching and assess further questions before the patient is discharged.

Comprehension of discharge instructions is required for patients to receive instruction for the management of medical diagnoses, appropriate medication usage, and follow-up guidance, which intends to protect patients from confusion and complications. Poor comprehension of instructions may interfere with the patient's ability to properly administer medication, follow treatment modalities, recognize complications, and adhere to follow up care (Alberti & Nannini, 2013). In the emergency room or urgent care setting, the patient's ability to comprehend information given may be decreased because of the scenario. The environment may seem chaotic to the patient because of patient flow and surrounding issues, so the patient may not be able to focus. Providers must rapidly develop an effective rapport with the patients, while managing distractions, interruptions, and time pressures within the acute care environment. The patients may feel anxious, without other access to the healthcare system, and are sometimes meeting the

provider for the first time, all of which may impede the patient education process or comprehension (Alberti & Nannini, 2013).

Significance of Project

It is the responsibility of the provider to properly educate the patient to promote optimal recovery and comprehension of important information concerning the illness. For patients to recover fully from an acute illness, it is important they properly understand treatment and the recovery process. With injuries or lacerations, it is important patients understand self care to prevent further injury or infection. In some cases, it is important to include the family in the education process if needed to aide in the wellbeing of the patient. Improving the outcome of the patient is the most important element to providing care as a patient advocate.

Through the use of evidence based practice, the provider should strive to improve patient experience, care, and outcome. Using previously reviewed research, the researcher implemented a new learning tool using current technology to improve the comprehension of discharge teaching for the patient related to the specific diagnosis. The usefulness of the project was assessed based on patient response as well as call backs and return visits. The DNP played a vital role in planning, implementing, and assessing the benefit of the project.

With the fast pace surroundings in the Urgent Care setting, the use of standardized discharge teaching via videos shown to patients could prove very beneficial for patient outcomes and also benefit the facility. The use of video teaching would decrease the amount of time needed by the provider for discharging the patient and in turn increase productivity of the facility. The use of informatics opens many new possibilities in the world of health care.

Purpose

If patients were properly educated on the diagnosis and prognosis, then the rate of repeat office visits for the same illness would likely decrease. This will in turn decrease healthcare cost and extended days missed of school or work. The spread of communicable illnesses would also be decreased if patients understand mode of transmission and period of being contagious. The project implemented the use of informatics to aide in the teaching of discharge instructions to the patients. A brief survey was also provided to assess the benefits of the teaching tool. The researcher recorded videos explaining important teaching on specific illnesses chosen for the project. The illnesses that were discussed were Strep throat, mononucleosis, upper respiratory infections, and urinary tract infections. Lacerations and sprains were also discussed. The

purpose of the project was to further educate the patients to promote optimal recovery from illness and comprehension of teaching.

According to Carrillo-Marquez (2015), acute pharyngitis accounts for approximately 12 million annual acute care visits in the United States. It is ranked in the top 20 most common primary diagnosis groups. It is more prevalent in the Winter and early Spring months. There are an estimated 616 million Group A Beta Hemolytic Strep cases annually worldwide. It is rated as one of the top ten worldwide pathogens. *Streptococcus pyogenes* is the most common cause of pharyngitis. Strep is most commonly seen in patients aged 5 to 15, but can affect men and women of all ages. Children often experience symptoms for 4 to 5 days. Strep is transmitted from person to person. Its growth can be facilitated on toothbrushes, orthodontic appliances, and even pets. An infected family member has a 40% chance of transmitting strep to another family member (Centers for Disease Control and Prevention, 2015).

Ebstein Barr mononucleosis is mostly commonly seen in patients who experience fatigue, lymphadenopathy, fever, nausea, and headache. In the United States, approximately 50% of the population seroconverts before age 5, which most of the rest in seroconvert in adolescence or young adulthood. Approximately 12% of college-aged young adults convert each year, with half of them developing acute infectious mono. Mono is transmitted through saliva droplets and other body secretions (Cunha, 2015).

Upper Respiratory Infections are the most common infectious illnesses in the general population and are the leading cause of missed school and work days. It is the most frequent acute diagnosis in the office setting. Children under the age of 5 have a higher incidence. Children have about 3 to 8 viral respiratory illnesses per year, adults and adolescents have approximately 2 to 4 a year, and adults over the age of 60 have fewer than 1 per year. There are more than 200 viruses that are known to cause URIs. URIs involve direct invasion of the mucosa lining the upper airway. Exposure to smoke can cause this lining to be more susceptible to infection. URIs are spread from person to person (Centers for Disease Control and Prevention, 2015). Inoculation of bacteria or viruses occurs when a person's hand comes in contact with pathogens and the person then touches the mouth, nose or when the person inhales directly respiratory droplets from an infected person who is sneezing or coughing (Meneghetti, 2015).

According to Centers for Disease Control and Prevention (2015), Urinary Tract Infections account for about 4 million ambulatory-care visits each year, representing about 1% of

all outpatient visits. It is most commonly caused by *Escherichia coli*, but can also be from other pathogens. This is commonly due to hygiene reasons. UTIs are most commonly in sexually active females, but can be seen in all populations.

PICOT Question and Expected Outcomes

With the implementation of a standardized teaching tool such as the video addressed in the project, the provider could be sure that every patient was told all the correct and pertinent information related to their diagnosis. By allowing the patient to ask questions after viewing the video, the patient was allowed to have further discussion if needed. This in turn improved patient outcome by improving knowledge and comprehension of what was taught. If the patient forgot something that was discussed, he/she could access the video via the Internet and re-watch if needed. This provided a way for the patient to answer questions without having to call back to the clinic if it was related to the information given at discharge. This would also help decrease the number of call backs and time spent by the nursing staff returning phone calls. If the patient fully understands expectations for wellness before they leave, they would not call back questioning the staff. The video teaching also provided more time for the provider to be working on discharge paperwork, or assessing a new patient if needed. This implementation would require less time for provider with the patient, but still allow the patient to feel the connection with the provider by seeing the provider on the video.

The expected outcome of this project and implementation was to improve the experience for the patient and assist to provide a better outcome for the acute illness of the patient. Patient outcome is always the most important aspect in healthcare.

Definition of Terms

The following terms were used to define key components of the implementation process. Each term is defined theoretically and operationally.

Discharge Instructions. Discharge instructions were defined theoretically as instructions given to patients on how to care for themselves after discharge. Operationally they were defined as information given to a patient about the diagnosis they are given. The instructions provide further instructions on prognosis and follow up care. Mode of transmission and means of transmission are also parts of the discharge instructions.

Urgent Care. Urgent care was defined theoretically as a place where individuals seek medical treatment or advice for acute illnesses. It was defined operationally as a setting in which

individuals are examined and provided care through a physician, nurse practitioner, or physician assistant. It accommodates equipment, tools, and clinical staff members that facilitate the health care professionals in meeting the needs of the patients.

Streptococcal pharyngitis. ICD-10 diagnosis code J02.0. Streptococcal pharyngitis was defined theoretically as an acute respiratory illness marked by fever, tender lymphadenopathy, absence of cough, rash, and swelling, redness, and exudates of the tonsils or pharynx (Centers for Disease Control and Prevention, 2015). It was defined operationally as a bacterial illness that is spread by respiratory droplets through person to person transmission (Carrillo-Marquez, 2015).

Mononucleosis. ICD-10 diagnosis code B27.90. Mononucleosis was defined theoretically as an acute clinical syndrome consisting of fever, pharyngitis, fatigue, enlarged spleen, inflamed throat, and adenopathy (Cunha, 2015). It was defined operationally as an acute virus that is transmitted by intimate contact with body secretions, primarily saliva. The virus can also be transmitted by the uterine cervix and blood transfusion. Mononucleosis is one of the most common acute illnesses seen in Urgent Care settings (Centers for Disease Control and Prevention, 2015).

Urinary Tract Infection. ICD-10 diagnosis code N59.0. Urinary tract infection was defined theoretically as an acute illness that presents with symptoms of painful urination in uncomplicated infections. More serious infections can be associated with abdominal or back pain, fever, sepsis, and decreased kidney function. It was defined operationally as an infection of the urinary tract that is most commonly caused by *Escherichia coli*. It is most commonly acquired from fecal contamination (Centers for Disease Control and Prevention, 2015).

Upper Respiratory Infection. ICD-10 diagnosis code J06.9. Upper respiratory infection was defined theoretically as an acute illness that is characterized of symptoms such as nasal mucosal erythema and edema, nasal discharge, fever, lymphadenopathy, foul breath, and possibly coughing. It was defined operationally as an illness that represents the most common acute illness evaluated in the outpatient setting. URIs Can range from a mild self-limited nasopharyngitis such as a common cold to a more serious illness such as epiglottitis (Meneghetti, 2015).

Sprain. ICD-10 diagnosis code T14.8. Sprain was defined theoretically as a musculoskeletal injury to a ligament as a result of abnormal forces applied to the joint. It was

defined operationally as the results of an injury to a joint that results in pain and swelling with range of motion.

Laceration. ICD-10 diagnosis code T14.8. Laceration was defined theoretically as a wound produced by the tearing of body tissue. Could be a cut or tear to the skin. It was defined operationally as the result of an injury that punctures to skin causing a tear or cut. This type of cut requires medical attention.

Literature Appraisal

A search was completed on the following databases: Academic Search Complete, CINAHL Complete, Health Source: Nursing/Academic Edition, MEDLINE, Psychology and Behavioral Sciences Collection, MEDLINE Complete. The following are keywords that were used: Patient teaching, patient comprehension, discharge teaching, informatics, recall, evaluation, recollection, evaluation, video teaching, and Acute Care. The studies included surveys through questionnaires, review of literature, and comprehensive evaluation of teaching methods. Articles that were related to the teaching healthcare providers instead of patients were discarded. Some articles that pertained more to chronic care settings or illnesses were also discarded. The studies were narrowed by adding more specific search terms. Studies were discarded based on relevance to the project. See Appendix A for Search Strategy Map.

Alberti and Nannini (2013) conducted a literature review with a goal to identify interventions that were used to provide discharge instructions, examine the methods used to assess patient comprehension, and determine the most effective strategies for assuring patient comprehension of discharge instructions. Their focus was on the Emergency Department and Urgent Care settings. Alberti & Nannini (2013) discovered that simplification of material is paramount in achieving patient comprehension of discharge instructions.

Chappuy et al. (2012) conducted a study to evaluate the extent to which parents understand four crucial points of discharge information from emergency departments: the reasons for their child's hospitalization, the diagnosis, prognosis and treatment. Chappuy et al. (2012) found that parents had a poor overall understanding of the information provided when their children were admitted to short stay units. Less than half of the parents understood the reason for admission as told by the physician in the emergency department. Previous studies

show that parents of sick children have a better recollection and comprehension of discharge teaching than when the adult is the patient. This may be due to the fact that the adult is not sick at the time of learning. It was also noted in this study that parental understanding was affected by the perception that the child was in pain. It may have been more difficult for the parent to receive and understand information from the physicians because of the concern about the suffering of their child. Increasing the time spent educating the parents did not seem to reflect on the comprehended knowledge. In this study, only 19% of parents understood all the information provided by the doctor at the time of their child's admission to the emergency department. One factor that did improve the parents' understanding was the nurse giving additional information according to Chappuy et al. (2012).

According to McBride and Andrews (2013), implementing effective teaching at the time of discharge can lead to a decrease in the rate of hospital readmissions and mortality for patients after discharge. McBride and Andrews (2013) conducted a study to identify and examine models and concepts relevant to improving discharge education in an acute care setting. In acute care settings, it is estimated that 40% to 80% of what is taught to patients is forgotten immediately following teaching, and that 50% of the information that patients do remember is recalled incorrectly (McBride & Andrews, 2013). This could be due to factors such as stress of an acute illness, an overload of new information, or patients' education and literacy levels.

The use of mobile applications in health care is becoming more prevalent daily. MobileSmith (2014) listed some statistical data to show the rise of mobile application use and the impact it could make on the health care society. A tremendous increase in the use of healthcare apps has occurred in the past few years. Almost 100 million Americans use mHealth technology and 38% of smartphone users deem their mobile device as an essential for finding health and medical information.

A survey of physicians in 2013 found that 93% of the physicians believe mHealth apps could improve patient outcomes, and 89% are likely to recommend a mobile health app to a patient. The downside to this is that the physicians believed that the majority of the apps that are available are limited in scope, functionality, and efficiency. They are not willing to recommend an app to their patient without evidence of approval and success. MobileSmith also looked at how mobile apps could effectively reduce healthcare costs for providers, payers, and patients. Twenty percent of patients who used a mobile app to record their blood pressure and weight on a

daily bases were readmitted to the hospital within three months compared to 60% of the patients who did not use the mobile device were readmitted. This could also prove to decrease the healthcare costs. Mobile devices can also be helpful to remind chronically ill patients to take medications on a daily basis.

The use of the Internet as a source for health information by patients and providers has rapidly increased over the past several years, and continues to do so. Physicians were reluctant at first to turn to the Internet for health information to improve patient interpersonal communication and education. The physicians expressed concerns about the anticipated time demands of emails from patients, lost time in patient visits to discuss information from unknown or dubious sources, and the unreliability of much of the health-related information posted on the Internet (Siegel et al., 2006).

The American Medical Association and the Joint Commission on Accreditations of Healthcare Organizations have standards and obligations that physicians must follow when dealing with patient education. Because of these regulations, more emphasis is placed on patient physician communications. With the development of new educational tools including websites and mobile applications, the patients have more opportunity to learn and be self-efficient. Siegel et al. (2006) conducted a study to prove that the use of the Internet, and potentially mobile applications, are very beneficial to the education and comprehension by patients concerning specific illnesses. The use of these databases also allowed the patient to take responsibility and play a larger part in their own care.

Lewis (1999) conducted a literature review that focused on computerized education for patients. Computerized education provided a private learning environment and immediate reinforcement of the learning that has occurred. Lewis reported that computer-based learning programs were popular and effective in delivering information and that patients were generally able to use them without complications. In eight studies, an improvement in knowledge scores was noted when computer-based patient education was compared with traditional instructions. Computer-based education can reach all ages across the spectrum. Patients with low socioeconomic status responded well to computer-based interventions. The use of computer-based education has a positive impact on clinical outcomes, knowledge acquisition, self-care management, and skill development. In 17 of 21 research reports, patients who participate in computer based patient education experienced significant improvements in the desired outcomes.

Blank and Smithline (2002) created a patient teaching program that included an education video and written instructions to educate patients to reduce prehospital delays in patients with chest pain. A group of patients received standard discharge teaching and another group received video teaching and written instruction. In this particular study there was no significant difference between the two groups.

Albert, Buchsbaum, and Li (2007) conducted a study to evaluate the short-term impact of video education in addition to standard education on heart failure patients. The authors evaluated self-care behaviors at a three month follow up visit. One group was given standard discharge teaching and the other given video teaching along with the standard teaching. The group of patients that received the video education had a higher mean self-care adherence score to reflect greater self-care. The study found that video education is a useful tool in education.

Literary Discovery

Description of Theory and Framework

When discussing the comprehension of adults to learning discharge instructions, the Theory of Adult Learning must be understood. The patients must be properly taught if expected to improve outcome. Malcolm Knowles developed his theory to discuss the process of learning as it is different for a child and adult. The adult process of learning must be used to insure that proper learning is possible.

Pedagogy is the art and science of teaching children. This was developed in Europe at the close of the 12th century. The pedagogical assumptions about learning and learners were based initially on observations by the monks in teaching very young children and relatively simple skills, originally mostly reading and writing. This model was adopted and reinforced as elementary schools were developed in Europe and North America. Because of this, during that time most of the research on learning was conducted on children. It was not until around WWII that adult learning was studied. When adult education began to organize, the teachers were noticing that the plans that they had been following were not working for the adults. The adults seemed to get bored and drop-out rates were high. The transmittal of knowledge and skills that had been the way for children previously, were not appropriate for adult learning (Knowles, 1970).

Alfred Whitehead began to look into this change. At that time, education was defined as a process of transmittal of what was known only when the time-span of major cultural change was

greater than the lifespan of individuals. Or other words, what people learn in their youth will remain valid and useful for the rest of their lives. Whitehead came to realize that definition was no longer relevant to society. Skills that made people productive in their 20's became out of date in their 30's. He then defined educational learning as a lifelong process of continuing inquiry. The most important thing about learning for children and adults is learning how to learn, the skills of self-directed inquiry.

Andragogy is the art and science of helping adults learn was developed in the 1960s. Malcolm Knowles viewed andragogy not to be specific to just adults. He noticed from reports of teachers that the concepts of andragogy were beneficial to youth age as well. He then redefined andragogy as another model of assumptions about learners to be used alongside the pedagogical model of assumptions, thereby providing two alternative models for testing out the assumptions based on the fit with the particular situation (Knowles, 1970).

There are four critical Assumptions of Pedagogy and Andragogy. First is the concept of the learner. In pedagogy, the learner is dependent on the teacher. The teacher is expected to take responsibility for determining what is learned, when it is learned, how it is learned, and testing to see if it was learned. In andragogy, the learned is self-directed. Teachers are to encourage the learner to self-direct. Some dependence may be needed in some situations. Second is the role of learners' experience. In pedagogy, the learners bring little experience that is relevant to teaching. Most will be gained from the teaching experience.

The primary techniques of textbooks, audiovisuals, lectures, reading assignments, and presentations present the experience. In andragogy, with age, we develop more experiences that have increased resource for learning, for others as well as self. Primary techniques in education are experiential techniques such as lab experiments, discussion, problem-solving, field experience, etc. The third is readiness to learn. In pedagogy, the student is ready to learn whatever concepts the school requires. Learning is organized on a level closely determined by age and a step by step progression for all learners. An example of this would be common core. In andragogy, the adult is ready to learn something when they experience a need to learn it in order to cope. Programs are set to help the learners address their "need to know" and provide real life applications.

The fourth is orientation to learning. In pedagogy, learners see education as learning subject matter content that will be used later in life. Curriculum is subject based courses. People

are subject-centered in their orientation to learning. In andragogy, learners see education as a process of developing increased competence to achieve their full potential in life. People are performance-centered in orientation to learning (Knowles, 1970).

Looking at Knowles (1970) theory, some of the key difference between a child and mature youth or adult can be summarized as follows: their self-concept moves from one of being a dependent personality toward being a self-directed human being, they accumulate a growing reservoir of experience that becomes an increasingly rich resource for learning, their readiness to learn becomes oriented increasingly to the developmental tasks of their social roles, and their time perspective changes from one of postponed application of knowledge to immediacy of application, and accordingly, their orientation toward learning shifts from one of subject-centeredness to one of performance – centeredness.

Children enter into the world in complete dependency. They are taught that adults will take care of them. Society defines the appropriate role of children as that of learners; this is their full-time occupation, the source of their rewards and self-fulfillment. Children are given the information that adults have decided they need. As children mature, their self-concepts move in the direction of greater self-direction, and as adolescence they take responsibility for managing their own lives. When they become adults they begin to no longer see themselves as full-time learners, but as doers and producers. Their chief sources of self-fulfillment are now status, in their eyes and in the eyes of others. They see themselves as being able to make their own decisions and face the consequence, to manage their own lives. The psychological definition of adulthood is the point at which individuals perceive themselves to be essentially self-directing. Malcolm Knowles came to the conclusion that adults experience a sense of exhilaration and release once they take responsibility for their own learning (Knowles, 1970).

Utilization of Model in Project

The concept of adult learning was used when assessing the comprehension of what adult patients were taught about their discharge teaching. The development of a teaching application or program that could also be used to evaluate the method and comprehension would focus on the needs of the adult learner.

Specifically looking at the urgent care setting, there are ways to implement the theory into the practice to improve the learning experiences for patients. The first way is to take into consideration the learning climate. An environment that is conducive to adult learning is

desirable. The environment should make the adult feel at ease, comfortable, informal, and have proper lighting and sound. Make the adult feel accepted, respected, and supported. Have freedom to express without fear of punishment. The attitude of the teacher reflects the openness of an adult learning.

Another way to implement the theory into practice is to look at the planning process. Adult learners like to be involved in the class planning or content planning. If the class is too large, a representative council may be used. The teacher and the learners should mutually agree on the objectives. In a clinic setting, the teaching is not usually done in groups, but if you had a specific group learning event, this would need to be taken into consideration. Learning and teaching is not just the responsibility of the teacher, the adult learner is just as responsible. The teacher is defined as a procedural technician and resource person. The teacher cannot “make” the students learn, but can help another person learn. In practice, a provider cannot make the patient understand the teaching. The comprehension is up to the patient, but it is the provider’s responsibility to provide the proper teaching to allow for proper learning (Knowles, 1970).

Once the provider completes the teaching, the fifth concept is to evaluate the learning. The evaluation of learning method can easily make the adult feel disrespected and judged by the teacher because it is often viewed as testing. It is important to allow the adult learner to provide feedback about the learning experience. This is often done by surveys asking the strengths and weaknesses. Another way to allow the adult to feel more self-directed is to allow them to evaluate themselves and compare to competencies at the beginning of the learning experience. In this project, the patient is going to be asked to participate in a survey to provide feedback and assess the comprehension of the information that was taught. The feedback will be transferred back to the clinic, and the data will be assessed and applied to practice if changes need to be made.

As a tool to learning, the development of an education tool by video was implemented during this project. Each video was specific teaching instructions for a particular diagnosis. The patient was shown the video while in the office while waiting for discharge paperwork. The video was specific to the patient’s diagnosis. The patient was then asked to participate in a survey that evaluated the discharge teaching experience. The patient was questioned about the preference of the teaching tool. Based on the knowledge gained from this theory, the videos were directed to the learning of an adult to meet their needs.

Methodology

This project was used to implement the use of informatics to aide in the teaching of discharge instructions for the patients. The researcher recorded videos explaining important teaching on specific illnesses chosen for the project. The illnesses that were discussed were Strep throat, mononucleosis, upper respiratory infections, and urinary tract infections. Teaching for sprains and lacerations were also provided. The purpose of the project was to further educate the patients to promote optimal recovery from illness and comprehension of teaching.

The participants were patients seeking medical treatment at an urgent care clinic. The patients were assessed and diagnosed per routine at the facility. If the patient was diagnosed with Strep throat, mononucleosis, upper respiratory infections, urinary tract infections or had a laceration or sprain they were chosen for the study. The first 100 patients with each given diagnosis were used in the study

Once the patient was diagnosed, the patient was shown the video in the office while waiting on discharge paperwork. The patient watched the teaching tool on a provided electronic device, or was directed to the website via the patient's own electronic device such as a cell phone or tablet. After the teaching was complete, a brief survey was also provided to assess the benefits of the teaching tool and asked for suggestions or further questions. The results were given to the project conductor. The patient was given instructions on how to access the website containing the discharge teaching videos for further reference if needed at a later time.

Two days after the visit, a third party program was used to contact participants via text message who had provided a cell phone number during registration. The participant was sent a reminder related to their diagnosis along with the link to the discharge teaching video they had watched in the clinic. This provided the patient the link to access the teaching video at their convenience.

Previous to the intervention, there were no specific ways of tracking patient call backs. Once the intervention was initiated, a message was placed in the chart of each participant. The message was used to notify staff that the patient was involved in the study. If the patient called back, the nurse would see the message and send the researcher an e-mail notifying her of the call back. If the patient returned to the clinic for the same complaint or diagnosis, the provider would see the message and notify the researcher.

Population

The clinic where the project was implemented is an Urgent Care clinic in Corinth, Mississippi. Corinth has a population of approximately 15,000. The ethnic break down of Corinth is about 70% Caucasian, 23% African American, 5% Hispanic, .1% Asian, 0.1% American Indian, and approximately 2% reported being two or more races (City-Data.com, n.d.). The Urgent Care clinic treats patients for acute illnesses. A full lab and x-ray is available at the facility. The clinic sees workman's comp patients for several of the surrounding factories and other businesses. Chronic illnesses are not treated at this Urgent Care clinic. The clinic also provides travel consultations with vaccination and preventative medications for overseas travel.

When discussing comprehension of discharge instruction by the patients, educational levels play a factor in how well patients understand what they are taught, or able to read teaching material. For the population of Corinth, 80.2% have a high school education or higher, 22.7% have a Bachelor's degree or higher, and 8.8% have a Graduate or professional degree (City-Data.com, n.d.).

Since these illnesses are all acute illnesses, the Urgent Care setting was an adequate place to implement this project. Another benefit to the implementation was that the time usually spent by the provider during discharge teaching could be used to see another patient, or complete other tasks due to the standardization of the video discharge teaching. Fast pace and decreased patient visit times are key factors in Urgent Care. This implementation aided in both of these areas.

Limitations

A limitation to the study was the inability to know the number of callbacks or return visits before the implementation to compare to callbacks and return visits after the implementation of the teaching tool. There was no system to track callbacks or return visits for the same diagnosis. As a result of the implementation of the teaching tool and text follow-up with the patient, the number of return visits could actually increase because the patient may feel well pleased with the experience at the clinic and with the provider, so he/she may want to return to the same facility. Because of this, evaluating patient returns was an imperfect measure because it could actually increase as a result of the implementation.

Another limitation of the study deals with a language barrier. There are several Hispanic families that seek care at the Urgent Care clinic. Some of these families do not speak English very well. This was a limitation in that the videos were recorded in English. The patients usually

have an interpreter with them, so that may resolve any issues of not being able to understand the videos with those patients.

The teaching of a deaf patient could also be a limitation. The videos were recorded and if the patient was unable to hear the recording, teaching may be impeded. This patient would be a candidate for written instructions.

Results

Only one patient declined to participate in the study during the time of implementation. Three-hundred-seventy-six patients chose to participate based on the diagnosis they were given. Of the participants, 26.3% (100) were diagnosed with strep, 3% (12) with lacerations, 5% (17) with a sprain, 13% (47) with urinary tract infections, 26.3% (100) with mononucleosis, and 26.3% (100) with upper respiratory infections. See chart in Appendix B.

Of the 376 participants, 54% (205) responded that they preferred video discharge teaching over verbal teaching, while 36% (134) prefer verbal discharge teaching. Ten percent (37) of the participants wrote in that they preferred either verbal or video teaching. Participants were given a copy of the web address where the teaching video specific to their diagnosis could be accessed. When participants were questioned on whether they would access the link if they developed questions about their diagnosis after discharge, 77% (289) of them responded yes, and 23% (87) responded no. All participants responded that they felt well informed about their diagnosis from the video teaching that was received.

There were 100 participants with the diagnosis of strep of whom, 54% (54) preferred video discharge teaching over the conventional verbal teaching. Thirty-eight percent (38) of the patients preferred to continue with verbal discharge teaching. Of the patients diagnosed with strep, 8% (8) wrote in that they would prefer either teaching style. The patients were provided with the web link to access the teaching video after discharge. Of the patients with this diagnosis, 80% (80) responded that they would access the teaching video after being discharged via the internet address provided, while 20% (20) responded that they would not access the link. All of the participating patients answered that they had been fully informed of their diagnosis.

Looking at the participants with lacerations, 58% (7) of the 12 participants found themselves favoring the video discharge instructions more than traditional verbal teaching. Thirty-three percent (4) prefer the verbal teaching, while one wrote in either. When asked if they

would access the video if needed after being discharged, 83% (10) responded yes, while 17% (2) responded no. All of the participants with lacerations responded that they felt well informed on how to care for their wound and felt well-informed of the discharge information.

Of the 376 participants, 17 of them were diagnosed with a sprain. Of the patients diagnosed with a sprain, 47% (8) prefer video discharge teaching over verbal teaching. However, 47% (8) responded that they did not prefer video teaching. Six percent (1) of the participants with sprains wrote in that they preferred either type of teaching. The patients with sprains responded that 76% (13) would reference the video via the web link provided, while 24% (4) responded that they would not. All 17 patients felt well informed about their diagnosis before leaving the clinic.

There were 100 participants with the diagnosis of mononucleosis. Of the patients diagnosed with mono, 62% (62) preferred video discharge teaching over the conventional verbal teaching. Thirty percent (30) of the patients preferred to continue with verbal discharge teaching. Of the patients diagnosed with mono, 8% (8) wrote in that they would prefer either teaching style. Eighty-one percent (81) of the patients with this diagnosis responded that they would access the teaching video after being discharged via the internet address provided, while 19% (19) responded that they would not access the link. All of the patients felt they had been fully informed of their diagnosis.

Participants with urinary tract infections represented 13% (47) of the total participants. 47 When responding to the question related to the preference of video teaching over verbal teaching, 59% (28) responded yes while 32% (15) responded no. Nine percent (4) of the participants wrote in that they preferred either. When asked if they would access the video via the address provided, 74% (35) responded yes and 26% (12) responded no. All 47 participants felt well informed about their diagnosis from the teaching.

Upper respiratory infections represented 26% of the overall participants with a total number of 100 participants diagnosed with URIs. Of the 100 participants, 46% (46) of them responded that they preferred video discharge teaching compared to the 39% (39) who responded they did not prefer video teaching. As with the other diagnosis, there were some participants who wrote in either. These participants represent 15% (15) of the 100. When asked if they would access the video after discharge if needed, 70% (70) responded yes while 30% (30) responded

no. All of the participants diagnosed with upper respiratory infections felt well informed about their diagnosis before leaving the facility. See the Figures in Appendix B.

Three participants called back to the clinic out of 376 who participated in the study. These callbacks were all related to the medications the participant was prescribed. One was for a child who had been prescribed pills and could not swallow them and requested the meds to be changed to liquid. The other two were participants who could not tolerate the medications prescribed and desired for the medications to be changed. There were two return visits. The patients who returned for the same problem were diagnosed with Upper Respiratory Infections. These participants returned because they desired to receive another injection to speed up the recovery of their illness.

There were no call backs related to a misunderstanding of the information given about the diagnosis. There were no return visits related to patients miss-interpreting the information given at discharge.

Discussion and Future Recommendations

Mostly positive feedback was received on the implementation of discharge teaching videos in the urgent care setting. The use of video discharge teaching tools could be used solely, or in conjunction with verbal teaching to assure the patient is properly educated on their diagnosis. This would insure the optimal recovery for the patient, as well as decrease the spread of the illness. The use of the tool would also be beneficial for the business by decreasing the time the provider spends with the patient to improve productivity in the fast pace of the urgent care setting.

The following table displays some of the responses of the patients when asked to give their opinion. The table is formatted to be quotes directly from the patients.

Table 1. *Written responses from patients.*

Written Responses From Patients
<ul style="list-style-type: none"> • The video is more detailed, but I don't feel like I can ask questions as easily.
<ul style="list-style-type: none"> • Using the video would expedite the office visit.
<ul style="list-style-type: none"> • Prefer information from a person at the clinic so I can ask questions. Making it available on the net afterward would be helpful.
<ul style="list-style-type: none"> • Verbal is better for the parents, but video is better for the younger clients in today's technology age.
<ul style="list-style-type: none"> • I liked the video in conjunction with the verbal follow-up. It reinforces the discharge instructions.
<ul style="list-style-type: none"> • I feel more informed about what is going on.
<ul style="list-style-type: none"> • Much more detailed and better communicated.
<ul style="list-style-type: none"> • It covered everything that I needed to know about my diagnosis versus verbal, something could have been left out.
<ul style="list-style-type: none"> • I prefer face to face so questions could be voiced right away. In so many cases now we are taking the personal aspect of our health care away and moving to an electronic provider.
<ul style="list-style-type: none"> • Sometimes we may not catch it the first time being said, so this does help me to better understand. Thank you!
<ul style="list-style-type: none"> • Video was great. Teaching by video was very helpful. Usually when verbal discharge instructions are given I personally try to listen but get side tracked with my sick child. Caring for them in the office prevents me from fully hearing and remembering 100% of the verbal instructions. Visually seeing the video allowed concentration and personally I will remember better by visual presentation.
<ul style="list-style-type: none"> • I was more in tuned to what was being said by watching the video.
<ul style="list-style-type: none"> • I learned a lot more about things I need to do and not to do to keep from spreading it and what it could possibly turn in to.
<ul style="list-style-type: none"> • I learned more about the causes.
<ul style="list-style-type: none"> • The video was very specific about symptoms, prognosis, causes, and precautionary measures.
<ul style="list-style-type: none"> • It answered questions I didn't know to ask.
<ul style="list-style-type: none"> • I love information about diagnosis and treatment. That way I am not googling and possibly getting wrong info.

- I like the video, but would still prefer a person to technology. A combination of both seems to be something I would like.

In the future, the use of video teaching tools could be spread to the chronic care setting. Patients with chronic illness such as diabetes, hypertension, hyperlipidemia, etc may find the added teaching beneficial to their understanding and adherence to medical treatment and advice as did the acute patients. The accessibility of the tool after the initial clinic visit may be more beneficial for the chronic care setting. The patients may access the video from home to become more knowledgeable of the disease, or more compliant with their treatment regimen.

References

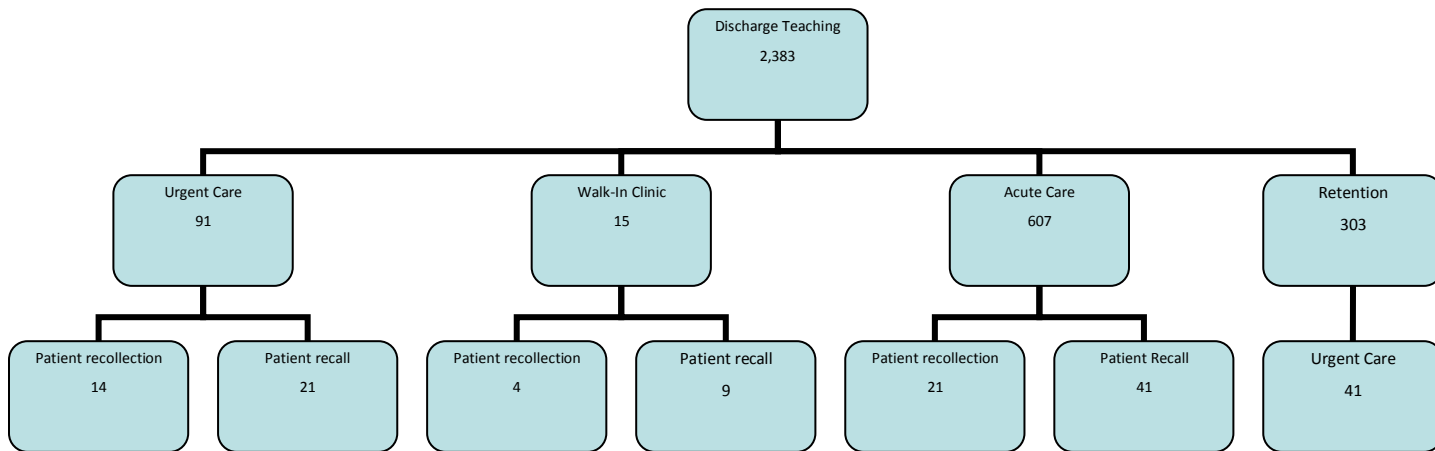
- Albert, N. M., Buchsbaum, R., & Li, J. (2007). Randomized study of the effect of video education on heart failure healthcare utilization, symptoms, and self-care behaviors. *Patient Education & Counseling*, 69(1-3), 129-139. doi:10.1016/j.pec.2007.08.007.
- Alberti, T., & Nannini, A. (2013). Patient comprehension of discharge instructions from the emergency department: A literature review. *Journal of the American Association of Nurse Practitioners*, 25, 186-194.
- Blank, F.J. & Smithline, H.A. (2002) Evaluation of an educational video for cardiac patients. *Clinical Nursing Research*, 11(4), 403-416.
- Carrillo-Marquez, MD, M. (2015, July 28). *Bacterial Pharyngitis*. Retrieved from <http://emedicine.medscape.com/article/225243-overview>
- Centers for Disease Control and Prevention (2015). Epstein-Barr Virus and Infectious Mononucleosis. Retrieved from <http://www.cdc.gov/epstein-barr/about-mono.html>. Retrieved on March 9, 2016.
- Centers for Disease Control and Prevention (2015). *Is this Strep?*. Retrieved from <http://www.cdc.gov/Features/strepthroat/>.
- Centers for Disease Control and Prevention (2015). *Urinary Tract Infection*. Retrieved from http://www.cdc.gov/ncidod/dbmd/diseaseinfo/urinarytractinfections_t.htm.
- Chappuy, H., Taupin, P., Dimet, j., Claessens, Y., Treluyer, J., Cheron, G. (2012). Do parents understand the medical information provided in pediatric emergency departments? A prospective multicenter study. *Acta Paediatrica*, 101, 1089-1094.
- City-Data.com. Retrieved from <http://www.city-data.com/city/Corinth-Mississippi.html>. Retrieved on April 9, 2016.
- Cunha, MD, B. (2015, October 06). Infectious Mononucleosis. Retrieved from <http://emedicine.medscape.com/article/222040-overview>. Retrieved on March 9, 2016.
- Doerr, Steven. (2015, August 31). Mononucleosis. Retrieved from http://www.emedicinehealth.com/mononucleosis/page10_em.htm. Retrieved on March 10, 2016.

- Knowles, M. S. (1970). *The modern practice of adult education*. New York: New York Association Press.
- Lewis, D. (1999). Computer-based Approaches to Patient Education: A Review of the Literature. *Journal of the American Medical Informatics Association*, 6(4), 272-282.
- Meneghetti, MD, A. (2015, July 31). *Upper Respiratory Tract Infection*. Retrieved from <http://emedicine.medscape.com/article/302460-overview>.
- McBride, M., & Andrews, G. (2013). The Transition from Acute Care to Home: A Review of Issues in Discharge Teaching and a Framework for Better Practice. *Canadian Journal of Cardiovascular Nursing*, 23(3), 18-24.
- MobileSmith (2014) Mobile apps as tools of cost reduction in healthcare. MobileSmith, vol 39. Mobile Smith Inc, USA
- Siegel, E. R., Logan, R. A., Harnsberger, R. L., Cravedi, K., Krause, J. A., Lyon, B., ... Lindber, D. A. B. (2006). Information Rx: Evaluation of a new informatics tool for physicians, patients, and libraries. *Information Services & Use*, 26, 1-10.

Appendix A
Literature Search Strategy Map

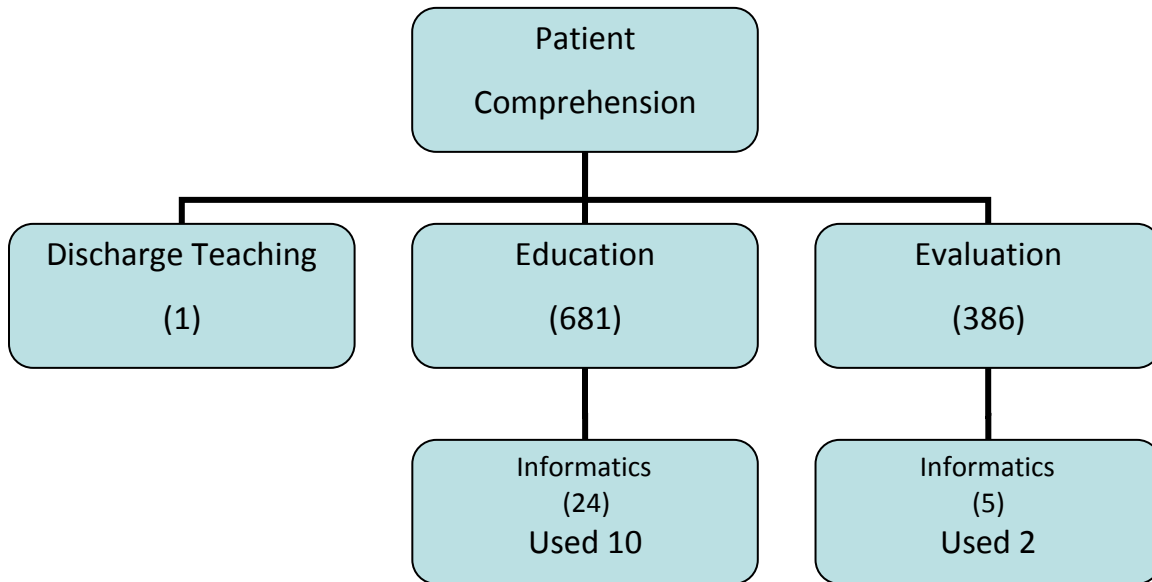
Academic Search

Key words: Discharge teaching, urgent care, walk-in clinic, acute care, patient recollection, patient recall, retention



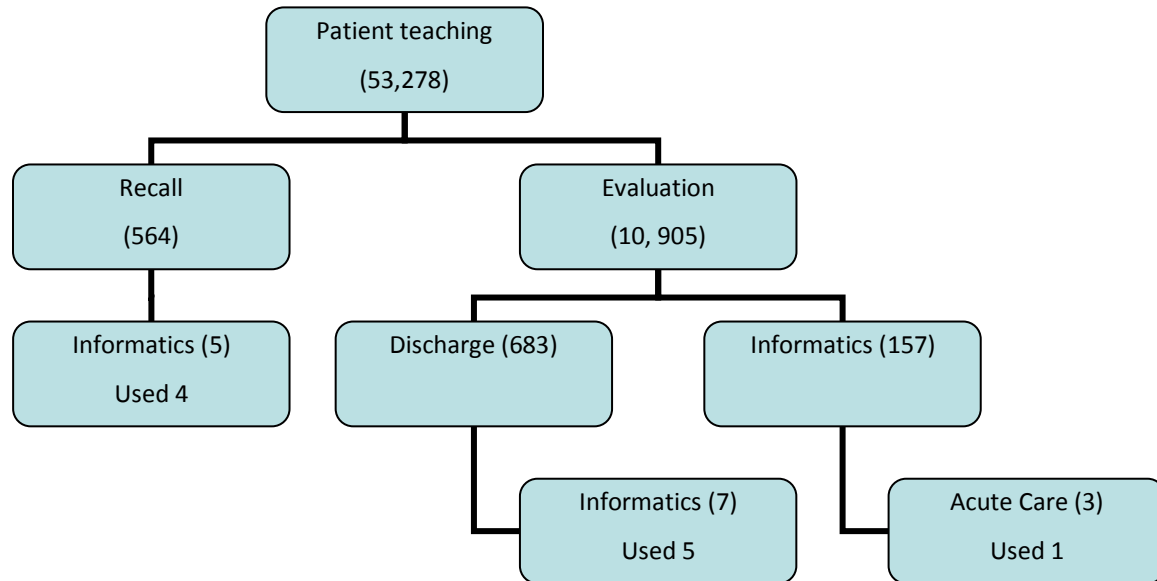
Search databases: Academic Search Complete, CINAHL Complete, Health Source: Nursing/Academic Edition, MEDLINE, Psychology and Behavioral Sciences Collection, MEDLINE Complete

Keywords: Discharge teaching, education, informatics, evaluation,



The same database was used for this search as well.

Keywords: Patient teaching, recall, informatics, evaluation, discharge, acute care



Some articles were not used because of these reasons: Evaluation was of the provider not the patient, took place in a foreign country, focused on primary care issue, focused on screening methods, or focused on health literacy.

Appendix B

Figure 1. Percentages of patients with each illness.

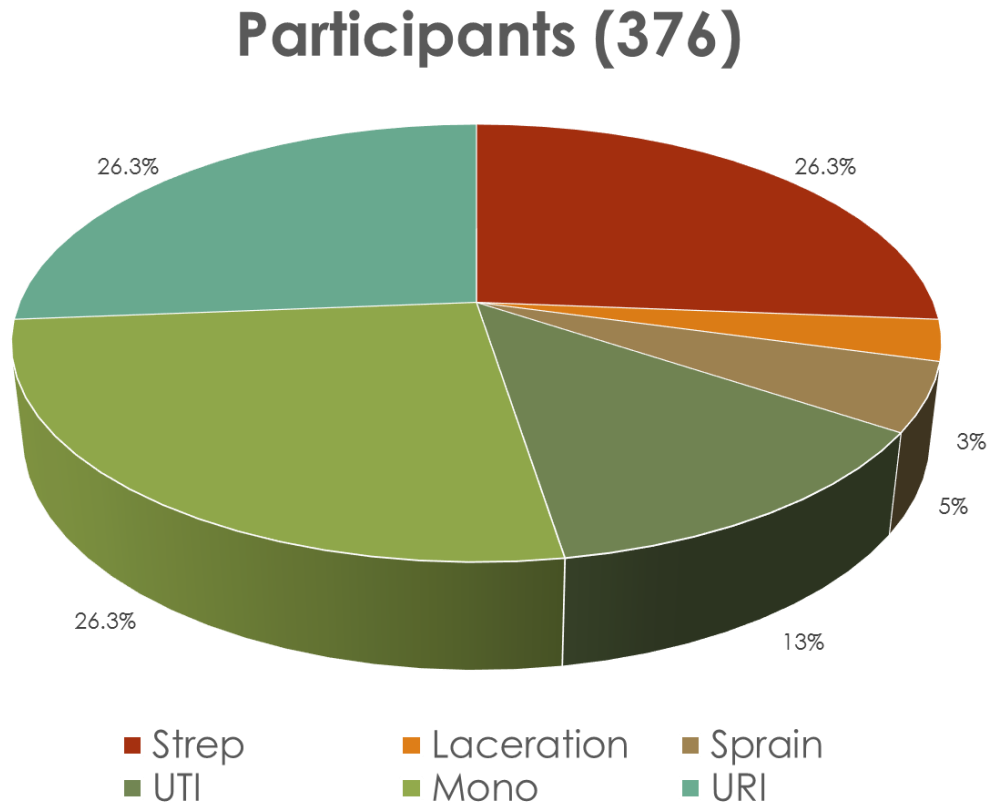


Table 2. *Patient preferences for video vs. verbal discharge instructions.*

In future visits, would you prefer video discharge instructions over verbal discharge instructions?

Diagnosis	Yes	No	Either
Strep	54%	38%	8%
Laceration	58%	33%	8%
Sprain	47%	47%	6%
UTI	59%	32%	9%
Mono	62%	30%	8%
URI	46%	39%	15%
Total	54%	36%	10%

Table 3. *Preference of accessing video instructions after leaving facility.*

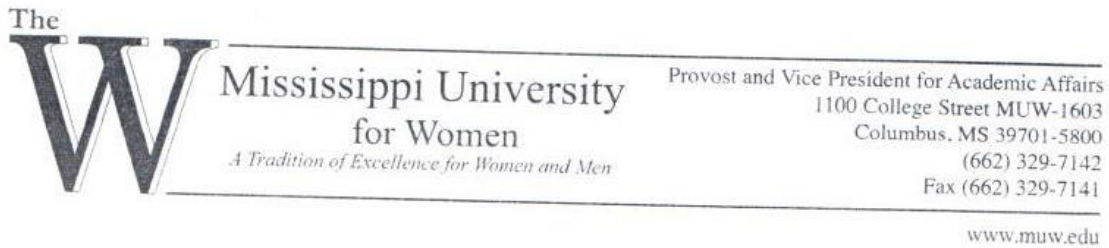
Do you feel you would access the video via the website provided for questions about your diagnosis after leaving the facility?

Diagnosis	Yes	No
Strep	80%	20%
Laceration	83%	17%
Sprain	76%	24%
UTI	74%	26%
Mono	81%	19%
URI	70%	30%
Total	77%	23%

Table 4. *Patient perception of being informed about diagnosis after visit.***Do you feel well informed about your diagnosis from today's visit?**

Diagnosis	Yes	No
Strep	100%	0%
Laceration	100%	0%
Sprain	100%	0%
UTI	100%	0%
Mono	100%	0%
URI	100%	0%
Total	100%	0%

Appendix C
IRB Approval Letter



June 17, 2016

Johnnie Sue Wijewardane, Ph.D.
Mississippi University for Women
College of Nursing and Speech-Language Pathology
MUW-910
Columbus, Mississippi 39701-5800


Dear Dr. Wijewardane:

I am pleased to inform you that the members of the Institutional Review Board (IRB) have reviewed the following proposed research and have approved it as submitted:

Name of Study:	Utilizing Technology to Improve Patient Comprehension
Investigator(s)	Christina Williams
Research Faculty/Advisor:	Johnnie Sue Wijewardane

I wish you much success in your research.

Sincerely,


Martin L. Hatton, Ph.D.
Associate Vice President for Academic Affairs

MLH/jh

pc: Tammie McCoy, Institutional Review Board Chairman