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Validating Effective Interventions in Patient/Family Education Using Tablet Computers

Rachel F. Fenske

Information Services/Outreach Librarian at the Charles M. Baugh Biomedical Library at the University of South Alabama, Mobile, AL.

Abstract

Patient education at the bedside, with Android tablet computers, has proven to be successful at the University of South Alabama Children's & Women's Hospital in Mobile, Alabama. Plans to expand the program within the USA Health System were made possible with a National Network of Libraries of Medicine Southeastern Atlantic Region Technology Improvement Award in 2018. This article discusses the implementation of tablet computers in a larger hospital setting within the USA Health System and discusses the impact of the educational interventions used in patient education within this health disparate community.

Keywords

patient education as topic; tablet computers; family education; health videos; program evaluation; chronic diseases; healthcare disparities

Background

Access to quality health information using tablet computers at the bedside at the University of South Alabama (USA) Children's & Women's Hospital has greatly assisted parents and their families to locate information on their or their child's condition, medications, and home-based procedures from the National Library of Medicine (NLM) and the National Institutes of Health (NIH) resources (1). The seeds of this project were established from a National Network of Libraries of Medicine Southeastern Atlantic (NNLM SEA) Technology Improvement Award in 2016 that purchased Android tablet computers and rolling bedside stands for patient education within the Pediatric and USS HOPE infusion units of the USA Children's & Women's Hospital. In addition to the resources from NLM and NIH, X-Plain® health videos from the Patient Education Institute were also available on the tablet computers. The project proved to be very successful and additional funding was sought to expand the program to include all units of the much larger USA University Hospital and two additional units of the USA Children's & Women's Hospital specifically, the High Risk OB/GYN and Mother Baby units. This expansion would create a comprehensive patient education program throughout the USA Health System leading to excellent patient care.

USA Health is home to the region's most respected physicians and researchers, who practice at various facilities that include the USA Children's & Women's Hospital, USA University Hospital, USA Mitchell Cancer Institute and USA Physicians Group clinics. The USA University Hospital is an acute level one trauma center that is also home to the Arnold Luteran Regional Burn Center, one of the busiest burn centers in the country. Meetings with the USA University Hospital nursing administration were held to discuss the implementation of the tablet computers for patient education at this facility so that patients on all units of hospital could be served. Nurse managers from each unit were involved in the discussions and after several meetings it was determined that the devices could serve an educational need at the facility. Each floor would have one tablet on a rolling bedside stand that would be easily accessible to the nurse educator and/or floor nurses. The resources on the tablets included those from the National Library of Medicine such as MedlinePlus, LactMed, Health Reach, Genetics Home Reference, Genetic and Rare Diseases Information Center as well as health videos from the Patient Education Institute's X-Plain® video collection.

The USA Children's & Women's Hospital had 12 tablet computers in place within the Pediatric, Neonatal Intensive Care Unit (NICU) and the USS HOPE Infusion units from the previous NNLM SEA Technology award but saw a need for more in the High Risk OB/GYN (HROB) and Mother Baby units of the hospital. The HROB unit attempted to expand the educational needs of their patients previously by adding weekly classes in the use of MedlinePlus in a classroom setting with a librarian, but because the patients are bedridden, it proved difficult to execute. Many of the patients have underlying chronic illnesses such as diabetes and heart disease and have extended stays in the hospital, some, up to a month. Education with the tablet computers on rolling stands for this patient population was a perfect solution as patients could read about pre- and post-delivery issues and newborn home care procedures at the bedside during the many weeks they are bedridden. Quality information in a format that is easy to use would provide patients with the necessary tools to continue using the resources after discharge.

Community Needs Assessment

The USA Health System conducts a community health needs assessment every three years. The 2015–2016 assessment identified several chronic health issues that were increasing in numbers within the community, specifically, respiratory cancers and diabetes (2). They acknowledged the need to focus on ways to combat these rising health conditions, most specifically, diabetes. Using tablet computers to access quality health information would allow healthcare professionals to take a proactive role in providing education in preventative care procedures and assist in the education of those already coping with diabetes while addressing the health needs assessment of this community. Nurse educators would have a wealth of information available to assist those learning about insulin administration, diabetic diets and compliance issues, as well as other conditions which would improve health outcomes. With the use of the tablets at the patient's bedside, focused education for the patient and their family members would be provided. Knowledge about the resources could also be included in diabetic education classes conducted on a monthly basis.

Additional facts from the community assessment indicated that Mobile County had seen a consistent rise in infant mortality over the past five years. In 2010, the infant death rate was 7.5 but by 2014 the rate rose to 10.2. For the black race, the rate was higher with 11.5 in 2010 to 14.4 in 2014 (2). By providing prenatal education with the resources from MedlinePlus and other reputable sources, infant mortality rates could potentially be reduced. The educational interventions using tablet computers were seen as very beneficial in addressing this and other rising health issues of our community.

Institutional Support and Planning

The USA Children's & Women's Hospital Administration continued to be an advocate for the program and supported the goal of incorporating two additional units. Two clinical nurse educators from HROB and Mother Baby respectively, each having over 25 years of experience, were the lead contacts. They promoted the project with great enthusiasm, assisted with the coordination of the nursing training schedules, and ensured the program was being implemented as planned.

The Director of Staff Development at the USA University Hospital, who had over 40 years of experience in nursing, was the lead contact at this hospital facility. She was instrumental in coordinating and promoting the project among all unit managers. In addition, the chief nursing officer of the USA University Hospital was in full support of the project and endorsed the use of the tablets among the nursing staff. Having this collaboration with both hospital administrators was key to the success of the project.

In all the preliminary meetings, topics of nurse training, number of tablets needed, storage of tablets and stands, theft issues, promotion of the project and data collection were discussed. From the information gathered, 13 Android tablet computers on rolling stands were purchased from funds through an additional NNLM SEA Technology Award received in 2018. The tablets were distributed to both hospital facilities with the University Hospital receiving eight tablets for each floor unit and the USA Children's & Women's unit receiving five tablets for the HROB and Mother Baby units. (Figures 1 & 2)

With the nurse managers' guidance and input, multiple training schedules for day and night shift nurses were developed and flyers were posted on the unit floors to promote the sessions. Due to the sheer number of nurses at the USA University Hospital, *train the trainer* sessions were provided to 22 nurse managers and nurse educators, who in turn, trained their floor nurses. Since the number of nurses of the HROB and Mother Baby units at USA Children's & Women's Hospital were more manageable, training sessions for all nursing staff on these units were provided. Training included use of MedlinePlus, X-Plain® Patient Education Institute videos and survey instruments that would be used to collect data. In all training sessions, 78 nurses were reached.

The USA University Hospital Residents were also aware of the tablets to augment patient education. Information on the tablets as well as an article supporting physician/patient relationships through patient education was distributed to stress the importance of this

endeavor (3). This proved to be very valuable as one resident became heavily involved in a research project and used the tablet computers extensively with patients.

Benefits of Tablet Computers

Within the outpatient cardiac clinic at the USA University Hospital, nurse educators and nurse practitioners provide one-on-one instruction to patients. Having access to MedlinePlus and health videos on the tablets allowed them to better inform the patients of their conditions, medications and treatment plans. Adherence to treatment plans can be difficult; however, these additional resources to encourage and inform patients of the benefits greatly influenced the outcome of patient surgery and long term health. The heart failure clinic began a series of educational sessions that included MedlinePlus as a vital resource for health information.

Access to quality health information has now expanded to include those in our community with high rates of cardiovascular disease, diabetes and cancer. Mixed with these chronic illnesses, Mobile County has a higher percentage of residents living at or below the federal poverty level (18.74% in 2014) as compared to the state (18.38%) and the nation (14.83%) (2). Additionally, the USA University Hospital operates as a safety net hospital providing services to low income patients where many self-pay. Educational interventions addressing health issues during treatment and care have assisted health care professionals in this health disparate community to address the rising mortality statistics, intertwined with low poverty levels,.

Patient education also plays a key role in reducing readmits. This patient/family education program assisted clinical staff and physicians address not only the health needs of this community, but instilled a mechanism whereby patients became aware and learned about their health conditions from accurate and reliable sources while at the hospital that continue upon discharge.

With the tablets, nurses have been able to greatly expand their current individual patient education with quality of resources from NLM. In addition, patients can view videos on their conditions and supplement their knowledge by using the tablets at any time during their hospital stay. Patients now take a more active role in the understanding of their conditions and become engaged in an interdisciplinary team approach to their medical care.

Patient education comes in many forms and patients like to refer to printed resources such as brochures or pamphlets. In the previous project using the tablets and print materials, 50% of family members indicated they used the print brochures and pamphlets that were available to them and 27% indicated they used print health magazines (1). A variety of brochures and pamphlets were again available to distribute to patients describing the resources from NLM and NIH. They included MedlinePlus, Mobile Resources at NLM, Drug Information Portal and Substance Misuse and Addiction Resources trifold brochures. Copies of the NIH MedlinePlus magazine related to diabetes, heart disease, COPD, Crohn's, sickle cell and other topics relevant to the health conditions of this target population were available to the units as appropriate. These materials provided valuable website information of the resources

discussed with the nurse educator or project librarian and could be passed on to other family members.

Evaluation

With the increased number of hospital units involved in this project, data was needed to determine if the tablets and resources would be as effective as in the previous study with fewer units. To evaluate the efficacy of the interventions and resources used and the usage patterns of all the units involved, the same survey instruments were used (1). The survey, however, would be completed online using a web based application called REDCap instead of a paper version. This suggestion was made by the nurses for ease of use and a more streamlined process. There were two surveys used to collect the data. The first survey, Initial Education Survey, recorded the demographics of patients, resources consulted, diagnosis and number of people served in each session and was completed by staff who provided the education. The second survey, Evaluation of Educational Activities, was completed by the patient upon discharge. This survey determined the efficacy of the resources and indicated which educational interventions helped patients learn more about their conditions or their newborn health issues. The data from the online surveys was very helpful in monitoring the project. Email messages were sent out periodically to nurse managers to determine how well they liked using the tablets. One unit in particular, indicated that they, as well as the patients, liked using the tablets very much, however, there were no usage statistics recorded. When this was pointed out, it was discovered that the nurses had forgotten to complete the surveys after each educational session. Monitoring usage throughout the grant period was key to identifying and addressing issues in a timely manner.

Survey Results

The data collected and reported from the surveys covered November 1, 2018 to May 1, 2019. There were sessions, however, as explained in the previous paragraph, that were not recorded. This was one obstacle in the project as it was difficult to get everyone to complete the surveys after each session even with email messages and written reminders labeled on the tablets.

Initial Education Survey Results

At the USA Children's & Women's Hospital, from the surveys completed showed 79 sessions were conducted serving 100 people. At the USA University Hospital, completed surveys indicated that 85 sessions were conducted serving 198 people. Results from the surveys gave valuable information on the number of sessions and patients served, sources used and the efficacy of the video intervention which are described below.

Units served and number of sessions

The usage statistics from the USA Children's & Women's Hospital represent all units of the hospital and not just those of HROB and Mother Baby since the project was integrating all the units in the patient/family education program. Table 1 indicates the unit and the number of educational sessions conducted.

The value of the tablets for patient education was recognized, but without specific patient educators, the use of the devices were not being maximized at the USA Children's & Women's Hospital, especially within the Pediatric and Hematology/Oncology units. Discussions with hospital administrators, nurse managers and child life specialists ensued with a recommendation to integrate hospital volunteers, specifically an undergraduate nursing student volunteer, to assist the outreach project librarian with patient education rounds once a week. The librarian agreed to expand her services on the pediatric floors as she saw the importance of the service and how it had helped many of the families in the USS HOPE Infusion Unit. Providing patient education on rounds where patients receive information based on their needs in a timely manner enhances the patient education process and helps to ensure they are a partner in the decision making process while having access to quality information (4,5). Having the student volunteer assist on these rounds was seen as a perfect solution, not only because of the undergraduate nursing student status, but the fact that the volunteer assigned was bilingual in Spanish whose population the hospital also served. The project librarian began training the student volunteer in the resources and developed procedures for integration into this type of service.

Utilizing hospital volunteers to assist with patient information needs has been successful in empowering patients to learn about their own health care so they can make informed decisions as well as fostering the interdisciplinary team model approach to patient care (6). By creating this new dimension to the project at USA Children's & Women's Hospital, patients received quality health information at the time of need, increased the exposure of the devices and their use among floor nurses, and provided a great learning opportunity for the student nursing volunteer.

Unfortunately, the tablet computers were not used within the surgical services unit at either hospital facilities. When initially discussed with staff in the pre-op surgical area, the concept was well received and staff thought the devices would be of great assistance. However, the practicality of patients using them in pre-op surgery was not ideal. Patients were seen very quickly for lab work and once in pre-op, educational opportunities with the devices were not seen as optimal.

The overall usage of the devices was higher at the USA University Hospital than at USA Children's & Women's Hospital. (Table 2). This is a direct correlation of each unit at USA University Hospital having a designated nurse educator who was also responsible for patient education. The nurse educators enjoyed using the tablets for education as it provided a rich array of resources for the patient and comments and statistics indicated that the patients liked using them as well.

The usage within the clinic setting, specifically cardiology, was high and was seen as ideal for the tablet computers. As a result, discussions with physicians and nurses in other clinics within the USA Health System occurred and tablet computers have now been placed in the pediatric sickle cell and internal medicine clinics.

Assessment data from the surveys and follow up meetings resulted in the redistribution of the devices to units where they would be used to their greatest potential. In addition to the

clinic setting, team members suggested that hospital dieticians be given a tablet for their specific educational needs. Their use would extend to those patients needing nutrition and dietary resources, as well as to advise and educate those needing to comply with dietary changes due to conditions such as diabetes and heart disease. Integrating these tablets within this specific area will be more effective as the dieticians will have more resources to use when engaging in patient education. Placing the tablets with staff educators will increase usage of the multitude of reliable and reputable sources available to the patients. This is a positive result of reviewing usage statistics and collaborating on a regular basis with team members to ensure the best use of the tablets.

Sources Used

Data was collected to determine the sources used and the percentage of time each was used. If units did not use the tablets often, the figures represent usage per source. The figures also reflect that a single educational session could have consulted one or more sources. (Tables 3 & 4)

It is evident that both hospitals used the video resources more heavily than MedlinePlus which could suggest that this learning modality was more appropriate for the low literacy rates of this population, even though MedlinePlus has easy to read materials and was promoted by nurse managers. It was encouraging, however, to see the use of Clinical Trials and HealthReach in patient education for this population. The genetic databases, Genetic and Rare Diseases Information Center (GARD), Genetics Home Reference (GHR) and the National Organization for Rare Diseases (NORD) were used quite extensively especially at the USS HOPE unit at USA Children's & Women's Hospital. It is here where treatments for childhood cancer, sickle cell and other rare conditions are conducted and where the librarian provides extensive education.

The main resource used by the Mother Baby unit was the breastfeeding videos from the Office on Women's Health (OWH), from the U.S. Department of Health and Human Services. This was reflected in the *Other* category which REDCap allowed to specify the resource used. The OWH has a wealth of videos on this topic which the unit nurses and a resident conducting research used quite extensively. Various organizational websites related to particular diseases were also noted in this category.

Video efficacy

The X-Plain® videos produced by the Patient Education Institute were an added benefit to the educational resources available on the tablets. The video subscription was implemented with the first project and proved to be extremely helpful in patient education (1). The videos are short in length, use simple language and animation and are culturally diverse. To accommodate the wider scope of conditions and diseases seen at both hospitals, the number of video titles increased from 356 to over 700. This increase greatly enhanced the collection of resources available to the patients and their families. The efficacy of the videos proved to be a successful means of education in other unit settings at the USA Children's & Women's

Hospital, but additional information to confirm the validity for this larger patient population was sought.

The survey questions and responses are listed in the following charts. The results are gleaned from a total of 94 responses collected from USA Children's & Women's Hospital and USA University Hospital (Tables 5, 6, &7).

Just as in the previous project, the figures above show clearly that the videos helped the patients and their family members learn more about their (or their child's) condition. It is interesting to note that those who knew quite a bit or completely about the condition, procedure or care totaled 36% but there was 92.6% agreement that the videos did help in the comprehension of the topic. The data from the previous project also confirmed that this educational modality is effective and improves comprehension of information and should be incorporated as an effective intervention in patient education (1). This intervention addresses low literacy issues and engages the patient in e-learning. Combined with interactive questions, the patient is engaged in learning complex concepts and self-care skills for themselves and their child. The videos trigger questions from patients seeking more information from their health care team, which fosters a patient-physician relationship and improves communication. Using technology to enhance the educational process is one step toward improving health outcomes. Patients learn more about their condition in a way that is engaging and effective.

Evaluation of Educational Activities Survey Results

The second survey, Evaluation of Educational Activities, which was completed by the patients upon discharge, helped determine the effectiveness of *all* the educational interventions available to patients in this program. Given the increased number of hospital units involved, it was discovered that this particular survey was the most difficult to complete. This was due to the timing of discharge and multiple activities associated with it. However, there were hospital units that were successful in obtaining data such as the NICU and Mother Baby at USA Children's & Women's Hospital and the Progressive Care Unit (PCU) and Cardiac Clinic at the USA University Hospital. The USS HOPE infusion unit did not engage in this survey as they do not discharge patients.

Below are the results to the questions asked on the Evaluation of Educational Activities survey. From the responses, the following activities were selected as those that helped patients and their families learn more about their health issues. (Tables 8 – 12).

Overall, patients liked using the tablet computers to locate health information whether it was using MedlinePlus, NIH resources or watching various health videos. The devices were easy to use and enabled the nursing staff to provide a means of patient education that was reliable and current. Nursing staff could leave the tablets in the patient's room where they and their families could browse and gather more information using a variety of sources for an extended length of time.

What resonated with both projects is that patients liked having print materials available even when an electronic means of obtaining medical information was presented. This is consistent

with conversations with parents in the USS HOPE unit and data from the previous project which indicated 46% percent of the families used print brochures as an activity that helped them learn about their or their child's conditions (1). Parents and family members like to have reminders of various websites, in the form of bookmarks and brochures, as well as print magazine articles that discuss the conditions they are coping with. Although the USS HOPE unit did not engage in this survey, the value of the print materials is evident based on the interactions with this patient population. Parents want reputable and reliable resource material they can provide other family members as inconsistent, conflicting and inaccurate information can be generated among various family members causing greater confusion, fear and unnecessary stress. The brochures on MedlinePlus, GHR, GARD and Mobile Resources at NLM have been greatly appreciated.

Having patients exposed to a variety of resources and learning styles is key for effective education. In populations where low literacy rates are prevalent, the video intervention worked extremely well. When providing patient education in the USS HOPE unit, time spent on resources such as GHR and GARD greatly benefitted the parents. Links to patient advocacy and support groups have been life-changing. Many families travel long distances multiple times a year to receive treatments or to take part in a clinical trial. The financial aid, travel and lodging support resources from GARD have provided otherwise unknown assistance to these families

It is reassuring that patients will continue to use the resources outside the hospital setting to help them make better decisions about their or their child's health. Many parents indicated that they like knowing where to go for quality health information instead of using Google®. Bookmarking MedlinePlus on patient and parents phones has provided quick access to quality information. When a child is diagnosed with cancer or other rare and debilitating diseases, the family structure becomes unraveled and trying to cope with the condition and treatment plans becomes overwhelming. Having the ability to direct parents to easy to read resources that can assist in the comprehension of new concepts, help with financial and travel costs, and provide information on support groups at a time when they can mentally grasp the information has been beneficial to all involved. Patient education is a powerful and needed aspect of healthcare and using technology to assist in this role has been quite successful.

Discussion

The tablet computers benefitted not only the various units of both hospitals, but extended to the clinics that serve the USA Children's & Women's Mother Baby population due to the work of two proactive lactation consultants in the Mother Baby unit. The devices were brought to the neighboring USA clinic to provide education using the Office on Women's Health videos on breastfeeding. This was one area that was not envisioned in the original implementation as the new clinic setting was being built. The expanded use of the resources to this patient population has been very well received. The nurses feel that the technology, ease of use of the devices and the resources have been very helpful to the patients in the clinical setting which has resonated multiple times when assessing the project.

What was not expected was the low use in the surgical pre- and post-op units. Upon initial consultation with the nursing staff in these units, it was thought to be a perfect location for patient education. However, it was discovered that the rate at which patients are seen and prepped for surgery did not allow for this type of educational intervention. Although the nurse educators encouraged its use, the tablets did not serve this patient population. As a result, the tablets were reassigned to areas that had a greater need.

The method of data collection was improved from a print form to an electronic means using the REDCap web application. The surveys were very easy to complete and could be done quickly. However, throughout the project period, it was a challenge to get the nurses and patients to complete them. Email messages encouraging the completion helped with this issue, but there were some that resisted the activity. This resistance was only from a small number of staff and did not represent all from both hospitals. Despite these obstacles, there was data to determine the usefulness of the interventions.

Since the completion of the surveys was an issue, this is one area that will be reassessed. The surveys were very short, so the length of the survey was not the issue. Investigation of software programs to track usage of non-subscription resources is an avenue that could be used to gather statistics.

Theft of the tablet charge cords and chargers was also a challenge. Unfortunately, the new feature of having the charger built into the rolling bedside stand was not an efficient means of charging the tablets. This method was extremely slow and as a result the devices had to be charged with the original cord and charger. It was difficult to monitor the security of the cords and chargers, but one solution that worked, was to keep the tablets and stands in the nurse manager's office rather than at the nurses' station. All nurses on the floor had access to this office. Securing the cords on the arm of the rolling stand with plastic ties was another solution that kept the cord with the tablet. When the tablet was in use, the charge cube would be kept in the nurse manager's office. Units that had close monitoring and used the tablets often did not encounter theft issues.

One effective strategy used throughout the project was communicating with key players on a regular basis. Emailing nurse managers of issues that needed to be addressed with unit floor nurses worked well in the absence of regularly scheduled meetings. Keeping the number of key players to those essential to the project made for effective communication management. Meeting constituencies on a regular basis kept the project on the forefront.

For this type of educational intervention to succeed, a nurse/patient educator on each floor is imperative. The motivation of the nurse/patient educator fostered the use of the tablets and resources and became an advocate of the tool. With this advocacy, acceptance of the new educational interventions improving patient care and health decisions was common. Its use and demonstrated effectiveness by the nurse educator enticed other nurses to engage in the intervention which saved time and benefitted the patient. Nursing staff had a means of supplementing their educational protocols with free resources from the NLM and NIH which can result in better health outcomes for the community.

The tablets were available to patients and their families at any time during their hospital stay which incited them to ask their health care providers more direct meaningful questions. Exposing patients and families to reputable resources that encompassed a variety of learning styles was core to effective patient education. Multiple learning modalities addressed the low literacy rates within the community and the ease and authoritative dimensions of MedlinePlus and Genetics Home Reference enabled patients and their families to become better informed with quality information. Using assessment techniques to identify and confirm usage was invaluable as it ensured the best placement of tablets for patient education. Reallocating devices to clinics and specialized departments enabled more effective use of the resources.

The program is still in its infancy and changing behaviors to use new materials and new devices takes time that must be factored when cultivating acceptance and adoption. New target populations were identified to increase usage within the USA Children's & Women's Hospital and statistics and feedback provided evidence that the clinic setting was very conducive for patient education.

Continuation Plans

The tablet computers will continue to be used for patient education at both hospitals. The funding from this award allowed the creation of a patient/family education program that now provides access to NLM and NIH resources, as well as subscription based health videos, on tablet computers for all units of both USA Hospitals. This has been a very effective project that both hospital administrations have embraced and supported. The continued cooperation and enthusiasm for the program, as well as the unparalleled support by the nursing staff of both hospital administrations, have made this project so successful. Meeting with nurse managers and team members will continue in order to monitor and update tablets and to keep abreast of their use and concerns that arise. Working side by side with staff in the USS HOPE unit, the project librarian has continued to provide access to valuable resources to patients, parents and family members who are coping with rare and chronic diseases. This work, initiated from the original project funded through the NNLM SEA Technology Improvement Award in 2016, will continue indefinitely.

Working alongside physicians and nurses has provided other opportunities for patient education and exposure to quality health resources. Meetings with the Ronald McDonald House Manager resulted in the integration of NLM resources on computer terminals in their family resource room along with the distribution of NLM brochures and pamphlets. Invitations to speak at family meetings were extended to the project librarian which provided an opportunity to make parents aware of the resources and remind them of the availability of the tablet computers on each unit of the hospital.

Conclusion

This project was extremely important to this health disparate community as it allowed a greater number of patients and their families to locate quality medical information free of medical jargon, in their native language, and at a time when they could mentally absorb

the material. Valuable consumer health information is now being provided in a community where education is so vital for positive health outcomes. Data from surveys and comments from patients and nurses indicate that tablet computers and the resources from NLM made a positive impact on patient education. Enabling patients and their families to obtain quality health information in collaboration with a health sciences librarian or nurse educator at the bedside using tablet computers has consistently proven to be a very effective and engaging intervention. Easy to read information from reputable resources has bridged a gap between the multitude of complex information patients receive from physicians and health care professionals. This awareness has provided a wealth of resources for patients and family members that can be used long after discharge.

Health services and medical librarians have a vital role in the multidisciplinary approach to the care of patients. Assisting in the patient education process within the hospital setting has resulted in an innovative and creative means that has helped the overall health of a community. This program can be seen as a model for patient education that integrates technology and various learning styles to provide accurate, current and easy to understand health information adaptable in a variety of hospital and health care settings.

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Figure 1.
University of South Alabama University Hospital Administration, Nurse Managers and
Project Librarian with tablet computers on rolling stands.

Figure 2.
University of South Alabama Children's & Women's Hospital Administration, Nurse Managers of High Risk OB/GYN and Mother Baby Units, and Project Librarian with tablet computers on rolling stands.

Table 1.

Units Served and number of sessions – USA Children's & Women's Hospital

Children's & Women's Hospital Units	#of sessions
USS HOPE	20
Hematology/Oncology	6
High Risk OB/GYN	10
NICU	5
Pediatrics	2
Surgery	0
Mother Baby	36

NICU=Neonatal Intensive Care Unit

Table 2.

Units Served and number of sessions – USA University Hospital

University Hospital Units	#of sessions
Surgical Services	0
Gastrointestinal surgery	2
Cardiology	7
Burn Center	1
Medicine	10
University Hospital Surgery	6
Trauma	8
ICU	1
MSCU	9
NSICU	4
PCU	22
Oncology	0
Cardiac Clinic	13

ICU= Intensive Care Unit

MSCU=Medical Surgical Cardiac Unit

NSICU=Neuroscience Intensive Care Unit

PCU=Progressive Care Unit

Table 3.

Sources Used at USA Children's & Women's Hospital (C&W)

C&W Unit	MedlinePlus	X-Plain® videos	Clinical Trials	GARD	GHR	NORD	Other
USS HOPE	85%	45%	5%	45%	55%	10%	10%
Pediatrics	100%	100%			50%		
NICU	20%	100%					
Hematology/Oncology	100%	66.7%			33.3%		
HROB	75%	75%					
Mother Baby		5.9%					94.1%

NICU= Neonatal Intensive Care Unit

HROB= High Risk OB/GYN

GARD = Genetic and Rare Diseases Information Center

GHR= Genetics Home Reference

NORD= National Organization for Rare Disorders

Table 4.

Sources Used at USA University Hospital Unit

University Hospital Unit	MedlinePlus	X-Plain® videos	Clinical Trials	Health Reach	Alabama Virtual Library	Other
Gastrointestinal Surgery		100%				
Cardiology	12.55%	87.5%				
Burn Center						100%
Medicine	22.2%	88.9%				
University Hospital Surgery		80%				20%
Trauma		83.3%				16.7%
ICU	100%					
MSCU		100%			12.5%	
NSICU		100%				
PCU		91.7%	4.2%	4.2%		
Cardiac Clinic		100%			7.7%	

ICU= Intensive Care Unit

MSCU=Medical Surgical Cardiac Unit

NSICU=Neuroscience Intensive Care Unit

PCU=Progressive Care Unit

Table 5.

Responses to the 1st video survey question.

Before viewing the X-Plain® video, how much did you know about your (child's) condition or procedure?	
None	17.0%
A little	46.8%
Quite a bit	29.8%
Completely	6.4%

Table 6.Responses to the 2nd video survey question.

After viewing the X-Plain® video, did the information give you a better understanding of the condition, procedure or care?	
Strongly Disagree	1.1%
Disagree	0%
No Opinion/ Uncertain	6.4%
Agree	61.7%
Strongly Agree	30.9%

Table 7.

Responses to the 3rd video survey question.

After viewing the X-Plain® video, did the information help you think of questions to ask the doctor or nurse?	
Strongly Disagree	2.2%
Disagree	5.4%
No Opinion/ Uncertain	14.1%
Agree	59.8%
Strongly Agree	18.5%

Table 8.

Activities that helped patients learn about their health issues.

Q 1. What activities helped you learn more about your health issues?		
Activity	Children's & Women's Hospital (46 responses)	University Hospital (85 responses)
Use of MedlinePlus	69.6%	8.2%
Viewing the X-Plain@videos	15.2%	88.2%
Sessions with a librarian	6.5%	2.4%
Print brochures	23.9%	8.2%
Print health magazines	13.0%	0%

Table 9.

Likeability of computer tablets

Q2. I liked using the computer tablets to find health information.		
	Children's & Women's Hospital (54 responses)	University Hospital (85 responses)
Strongly Disagree	1.9%	11.8%
Disagree	0%	0%
No Opinion/Uncertain	1.9%	3.5%
Agree	29.6%	52.9%
Strongly Agree	66.7%	31.8%

Table 10.

Confidence levels using MedlinePlus

Q3. Searching MedlinePlus has given me more confidence locating quality health information on my (child's) health issues.		
	Children's & Women's Hospital (52 responses)	University Hospital (84 responses)
Strongly Disagree	1.9%	7.1%
Disagree	0%	0%
No Opinion/Uncertain	42.3%	22.6%
Agree	21.2%	51.2%
Strongly Agree	34.6%	19.0%

Table 11.

X-Plain® video effectiveness

Q4. Viewing X-Plain® videos gave me a better understanding of my (child's) health issues.		
	Children's & Women's Hospital (52 responses)	University Hospital (85 responses)
Strongly Disagree	1.9%	10.6%
Disagree	0%	0%
No Opinion/Uncertain	42.3%	4.7%
Agree	21.2%	54.1%
Strongly Agree	34.6%	30.6%

Table 12.

Continued use of resources

Q5. I will continue to use the resources learned.		
	Children's & Women's Hospital (53 responses)	University Hospital (85 responses)
Strongly Disagree	1.9%	10.6%
Disagree	0%	0%
No Opinion/Uncertain	18.9%	0%
Agree	18.9%	61.2%
Strongly Agree	60.4%	28.2%