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## Engaging Patients to Prevent Harm: Implementation of Hospital Acquired Pressure Injury Prevention Education Videos

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Engaging Patients to Prevent Harm: Implementation of Hospital Acquired Pressure Injury

Prevention Education Videos

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing

Practice

at the University of Kentucky

By

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## **Abstract**

**PURPOSE:** The purpose of this proposal is to evaluate the introduction of pressure ulcer prevention videos to at risk adult patients in the intensive care unit within the acute care health setting.

**METHODS:** The study design is a retrospective chart review to analyze the effect of the pressure ulcer prevention videos on the number of pressure ulcers and incidence rate while comparing Jackson/Cubbin scores. As pressure ulcers continue to rise, patient education through the Get Well Network is a required intervention. This project is relevant in reducing pressure ulcers and increasing patient safety. Data collection took place from July 1<sup>st</sup>, 2019 and September 30<sup>th</sup>, 2019. The Center for Clinical and Translational Science department randomly selected 1000 charts from all patients admitted to the 9<sup>th</sup> and 10<sup>th</sup> floor Tower 200 Intensive Care Units with a Jackson/Cubbin score of 36 or less.

**RESULTS:** The study identified no statistical difference in the prevalence of pressure ulcers. The overall incidence of new hospital acquired pressure ulcers in the Intensive Care Units was decreased by one with the introduction of the pressure ulcer prevention videos versus prior to implementation. There was no change in median Intensive Care Unit length of stay but there was a statistically significant decrease in hospital length of stay.

**CONCLUSION:** Although there was a small reduction in newly acquired pressure ulcers, there is a need for video education for acute care hospitalized patients. By increasing patient knowledge about pressure ulcer prevention, video education can dramatically reduce costs for healthcare systems and provided safe patient care.

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## Dedication

I would like to dedicate this project to my parents, boyfriend, brother, family, friends and work family. First, to my parents, I would not be where I am today without your love and support. You are the best people I know. This has been a long five-year journey, but you have made it less daunting being at my side every step of the way. To Adam, your continuous love, support and encouragement has helped me get where I am today. To my brother, thank you for your gift of laughter and support. To my family, your love and encouragement has helped me through this process. To my friends, thank you for understanding my limited time to share with you will soon be a thing of the past. Lastly, to my work family, I thank you for lifting me up in times of stress. I share this chance to grow in my career with all of you.

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# Engaging Patients to Prevent Harm: Implementation of a Hospital Acquired Pressure Injury Prevention Education Videos

## **Introduction**

Hospital Acquired Pressure Injuries (HAPIs) are a growing problem in hospitals across the United States. Efforts are needed to educate patients and their families on pressure reducing strategies. Despite evidence-based prevention strategies already in place, HAPIs continue to be a growing problem.

## **Background**

A pressure ulcer occurs when an area of skin and underlying tissue, usually over a bony prominence, is damaged by loss of blood supply as a result of prolonged pressure or friction (bedsores; Mitchell, 2018). Pressure ulcers can lead to serious complications, including infection, pain, loss of independence, increased medical expenses and prolonged hospitalization (Serra et al., 2012). In fact, worldwide, 60 million patients die of pressure ulcer-related complications each year (Park & Lee, 2015). Additionally, more than 2.5 million patients in the United States suffer from pressure ulcers in an acute care setting each year (Paull et al., 2013). Because this has become a serious issue, the Centers for Medicare and Medicaid Services (CMS) declared pressure ulcers as a preventable complication within the acute care setting and have reduced reimbursement to hospitals for acquired pressure ulcers (Paull et al., 2013; Swafford, Culpepper & Dunn, 2016). The Joint Commission has also added pressure ulcers to the list of patient safety indicators as a preventable complication. The cost of one pressure ulcer is approximately \$60,857.38, of which \$38,297.64 is used for nursing labor and \$22,559.74 for treatment products and equipment (Fernandes Costa Lima et al., 2015). Annually, the total cost of pressure ulcer treatments in the United States is \$11 billion (Gefen, 2018). Gefen (2018)

points out that treatments for these ulcers are painful, increase length of stay, and often require surgery, and that this has produced a financial burden on the U.S. healthcare system.

Pressure ulcers are a serious problem in today's healthcare system, especially within the U.S. Much research has been conducted to focus on prevention. There are no data comparing the prevalence of pressure ulcers state by state. Pressure ulcers are common all over the world, and the rate of pressure ulcers in the United States is fairly similar to rates in other countries (Jiang et al., 2014). The prevalence rate of pressure ulcers in the United States has increased significantly from 7% to 15%. The rate in Canada is 25%, and Korea's rate is 28.2% (Park & Lee, 2015). Global mortality has increased 32.7% from pressure ulcers alone (Patton et al., 2018).

According to the National Pressure Ulcer Advisory Panel there are six stages of pressure ulcers: suspected deep tissue injury, Stages I-IV and unstageable (Jiang et al., 2014). In 2006, CMS declared Stages III and IV pressure ulcers that occur during hospitalization are among conditions considered preventable by evidence-based prevention guidelines (Swafford, Culpepper, & Dunn, 2016). In 2008, the CMS stated a patient acquiring a pressure ulcer stages III and IV is non-reimbursable by Medicare (Deng, Yu, & Hu, 2017). Stage IV ulcers have mortality rates ranging from 22-37% of which 90% will die within four months (White, 2014).

First, it is vital to identify those populations at risk. Pressure ulcers are a debilitating health problem that tends to be a complication for individuals who are elderly, immobile, malnourished, incontinent, and suffering from acute illness and/or neurological deficits (Holm, Mesch, & Ove, 2007). Pressure ulcers can occur in both hospital and community settings (Holm, Mesch, & Ove, 2007). Due to severity of illness and limited mobility (Ahtiala, Kivimäki, & Soppi, 2018), the risk of pressure ulcers is highest among patients in the intensive care unit (ICU;

Cox, 2011). Many factors can put a patient at risk for pressure ulcer development. Several risk factors common in ICU patients include limited mobility, poor nutrition, incontinence, limited activity, compromise of skin condition, altered mental state, and decreased sensory perception (Ahtiala, Kivimäki, & Soppi, 2018). ICU patients may also have difficulty expressing pain caused by pressure or the need for a position change (Ahtiala, Kivimäki, & Soppi, 2018). In most instances, patients have multiple risk factors. Providers must evaluate patients' risk in order to prevent pressure ulcers and the complications that can arise from them.

Common comorbidities associated with pressure ulcers include diabetes, pulmonary disease, vascular disease, disturbances in circulation, hypotension and vasopressor use (Ahtiala, Kivimäki, & Soppi, 2018). These comorbidities make patients more susceptible to acquiring a pressure ulcer and delay healing once an injury occurs. If left untreated, pressure ulcers can result in morbidity and mortality. Individuals with pressure ulcers have a 4.5 times greater risk of death than persons with the same risk factors who do not have a pressure injury (Kirman, 2018). Therefore, any intervention that may assist in preventing pressure ulcers is important. In current practice, the University of Kentucky uses the Jackson/Cubbin Risk Assessment Scale to identify those patients at risk of developing a pressure ulcer who are admitted to intensive care units.

The strategies CMS suggests for preventing pressure ulcers and their resultant complications include clinician training, implementation of evidence-based protocols, and patient education (Swafford, Culpepper, & Dunn, 2016). The Joint Commission also recognizes the importance of educating hospitalized patients (Denny et al. 2017). However, there is no broadly accepted best practice educational intervention (Denny et al., 2017). Video streaming or webcasting refers to a video stored on the internet, available for viewing at any time (Wirihana et al., 2017). There is limited research on the use and efficacy of videos as an educational approach

to teach (Wirihana et al., 2017). According to the limited research available, educational videos are more effective than written materials to increase knowledge and modify behaviors (Denny et al., 2017). However, currently there is no research available on the use of videos in the prevention of pressure ulcers. The current practice is for the nursing staff to provide written education to patients and make sure they understand the information provided. Technology is a new way to educate patients about pressure ulcer prevention. For example, the Get Well Network (GWN) is a tool used to engage and empower patients and family members by providing innovative, individualized education through videos and webcasts.

The University of Kentucky (UK) was rated “as expected” for the incidence of pressure sores acquired in the hospital (Healthgrades, 2018). This means UK did not have more pressure ulcers than predicted for the fiscal year. They are on target, but their goal is to prevent more pressure ulcers than projected. Therefore, UK’s nursing leadership created a No Harm Initiative to improve patient safety and quality of care. Their goal was a 30 percent reduction in the rates of 10 hospital-acquired conditions, including pressure ulcers. Due to high HAPI rates, the No Harm Initiative created new initiatives for best practice enterprise wide. Standardized care provides highly reliable nursing care to patients. Education provided to patients surrounding pressure ulcers should be standardized via interactive patient educational videos streamed through the GWN.

Videos are an attractive approach to enhance the teaching provided by the nursing staff to help patients learn complex health-related concepts and skills (Wirihana et al., 2017). Video education can also be a more cost-effective means of delivering educational content (Tuong et al., 2014). It enables providers to reach a broad audience of patients quickly and easily via their in-room televisions (Tuong et al., 2014). Video learning also reduces the amount of paper

needed for educational material. In addition, the use of a video stream can assist nurses with time constraints, allowing more time for patient care, and the video encourages educational discussions between nurses and patients (Wirihana et al., 2017). A patient and their family members can watch the video together to learn the same material, as opposed to individually teaching each person.

A video-based educational tool also helps standardize the delivery of education, reducing the inconsistencies that can arise from educator to educator (Tuong et al., 2014). Video-based education can be a more effective way of providing information to low health literacy populations than the use of written information as well (Tuong et al., 2014), and videos can be tailored to meet the learning needs of the patient (Wirihana et al., 2017). Videos selected from a bank can be added to the patient's television to be watched at their convenience. This allows for patient-specific education tailored to their health conditions.

### **Purpose**

The purpose of this project is to evaluate the effectiveness of two pressure ulcer educational videos for adult patients in the acute care hospital setting. Specific aims of this project include examining any change in the incidence of pressure injury rates after receiving the HAPI video education, examining any change in the total number of pressure injuries before and after viewing the HAPI video and determining if patients view the videos. The goal of the HAPI videos is to decrease the number of pressure ulcers by improving patient's knowledge of pressure ulcers and how to prevent them. It is anticipated that decreasing pressure ulcers will reduce patients' length of stay, reduce the cost of hospitalization, and improve patient quality of life. This project will also be identifying associations between comorbidities and pressure ulcers within this patient population.

The goal of this project is to reduce HAPIs in an acute care setting by enhancing patient knowledge and engaging patients to be involved in their pressure injury prevention plan. This can be accomplished using the Health Belief Model. Self-management support for patients can improve adherence to the pressure preventative plan and improve health outcomes. Patients will be able to use the Health Belief Model to improve their knowledge of pressure ulcers, and use self-efficacy to prevent development of these injuries by utilizing the HAPI videos (Appalasamy, et al., 2018). The goal of providing education to the patient and family on pressure ulcer prevention is to prevent a pressure ulcer altogether through self-efficacy. Education improves patient self-efficacy to empower them to get involved in the prevention of pressure ulcers. For example, if the patient knows they are to be turned every two hours due to limited mobility for a recent stroke and it has been 2.5 hours since their recent turn, they have the knowledge to call out to the nursing staff to remind them that they need to be repositioned. Or the patient can stand up and walk around every hour to two hours to prevent continuous pressure on the coccyx from sitting.

The videos are a useful tool that provides knowledge, improves confidence, and promotes self-learning among patients about various diseases and conditions (Appalasamy, et al., 2018). The patient can use the Health Belief Model construct to motivate and to induce self-efficacy skills to promote healthier outcomes and prevent the development of a pressure ulcer (Appalasamy, et al., 2018). The goal is to teach patients to be more aware of their own risk factors so that they may become their own advocates and get involved in their own care. The more involved a patient is in their own care, the more likely they are to participate and improve their own health outcomes.

## Methods

This was a pre/post study. Retrospective and prospective chart reviews were performed to determine if pressure ulcer rates and total number of pressure ulcers acquired would be affected by utilizing the HAPI videos as the intervention. The first portion of data were collected from February 1, 2019 to April 30, 2019, three months prior to the implementation of the HAPI videos. The ability for the videos to be ordered was based on the patient's Jackson/Cubbin score. Nursing staff were given a two-month adjustment period after the videos were made available to adjust to the automatic order set. The second portion of data were collected from July 1, 2019 to September 30, 2019 after implementing the order set for the HAPI videos. Only the second cohort of patients received the HAPI videos. The names of the videos are as follows: GWN-Pressure Ulcer Prevention in the Hospital and GWN-Pressure Ulcer Treatment. Expected outcomes included a reduction of pressure ulcer rates on the 9<sup>th</sup> and 10<sup>th</sup> floor ICUs with the use of the HAPI videos on the hospital's webcasting system, the GWN. The HAPI videos included topics such as turning positions used for preventing bedsores, pressure points, pressure ulcer treatment and arm and leg exercises. The videos are scripted videos for standardization that were already present in the GWN but not utilized. The GWN is a tool to support nursing staff in starting or reinforcing individualized nursing education to patients through videos. Education on the use of the HAPI videos for nursing staff was provided via an email from their managers.

The patient population chosen for improved HAPI rates for this initiative were patients admitted to the ICUs. The earlier a patient is identified as at-risk for a pressure ulcer, the sooner the issue can be addressed. The Jackson/Cubbin scale, which providers use to assess patients' risk for the development of pressure ulcers, was developed specifically for ICU patients (Park & Lee, 2015). The scale consists of 12 categories of risk factors, including: age; weight; skin

condition; mental status; mobility; nutrition; respiration; incontinence; hygiene; and hemodynamic status (Park & Lee, 2015). The scale is graded from 1 (highest risk) to 4 (lowest risk). The minimum score is 9 and the maximum score is 48 (Ahtiala et al., 2018). The lower the score, the higher the risk of developing a pressure ulcer (Ahtiala et al., 2018). See Table 1 for an example of the Jackson/Cubbin Scale. For example, a patient would score 36 on the scale if they met the following conditions: 40-45; obese; no past medical history; intact skin condition; mental condition is awake and alert; very limited mobility; hemodynamically stable without inotropes; spontaneous respirations; requires <40% oxygen and is stable on movement; has enteral feeding nutrition; is incontinent to urine and feces; needs much assistance for hygiene; and traveled to a Computerized Tomography scan within the last 48 hours.

It is already standard practice at UK Hospital for bedside nurses to use the electronic medical charting system to determine a Jackson/Cubbin score for each patient in the ICU on every shift, and then discuss the risk with the patient. This score alerts both the nurse and the charting system if a patient is at risk for pressure ulcer development. The HAPI videos are loaded to the patient's GWN bank of videos that are displayed on the patient's television for educational teaching and viewing. The videos are automatically ordered for a patient based on a Jackson/Cubbin score of 36 or less. A score  $\leq 29$  indicates a high or extremely high risk of pressure ulcer (Ahtiala et al., 2018). A higher score than 29 was selected to allow time to identify those at high risk and provide adequate education and intervention before a pressure ulcer could develop. A Jackson/Cubbin score of 36 or less was selected to identify a much broader range of patients before they are most at risk.

The videos were intended to start a discussion between patients and nurses, to encourage patients to be more involved in their care, and to help nurses verify the patients' knowledge of

pressure ulcers. When the videos are viewed by the patient, the charting system marks the videos as viewed in the patient's electronic medical record under the Education tab. The patients on each unit received the exact same pressure injury prevention interventions and education from the pressure injury prevention video through the Get Well Network, discussion of risk of pressure injury development and prevention with nursing staff, as well as pressure injury prevention interventions as outlined by hospital policy.

### **Setting**

The study was conducted at University of Kentucky Albert B. Chandler Medical Center in Lexington, Kentucky. It is a 925-bed acute care hospital part of the UK HealthCare enterprise. UK offers 136 intensive care beds among 8 ICUs. The hospital draws upon the resources from six UK colleges: Medicine, Nursing, Health Sciences, Dentistry, Pharmacy and Public Health. UK Hospital is ranked in the 25th percentile of academic medical centers. According to the website for Albert B. Chandler Hospital, UK HealthCare professionals provide the "most advanced, most effective care available to patients". Ongoing research is conducted hospital wide to provide patients with the "most sophisticated, most up-to-the-minute medical techniques". The mission of the hospital is to provide the best and safest care available to every patient. The University of Kentucky Hospital provides acute inpatient care to the citizens of Lexington and surrounding counties, cities, and states.

The target population of this study included patients located in the ICUs of the 9th and 10th floors of Tower 200 at the University of Kentucky Hospital. Each unit houses 16 beds that are predominately managed by the Pulmonary Medicine service. These units have been chosen for comparison due to similarities in size, staffing patterns and patient population. The occupancy of these beds stays full.

## **Sample**

The sample consisted of inpatients who were admitted to Pulmonary Medicine service and scored a 36 or less on the Jackson/Cubbin scale between February 1, 2019 to April 30, 2019 or who were admitted to the Pulmonary Medicine service, scored a 36 or less on the Jackson/Cubbin scale with the HAPI videos between July 1, 2019 and September 30, 2019. Inclusion criteria were: a.) 18 years of age or older, b.) a score of 36 or less on the Jackson/Cubbin scale, charted during each shift by the bedside nurse, c.) ability to speak and understand English, and d.) admission to the ICU beds of 9<sup>th</sup> floor Tower 200 or 10<sup>th</sup> floor Tower 200.

Exclusion criteria included patients who were a.) less than 18 years of age; b.) older than 100 years of age; c.) unable to speak English; and/or d.) admitted to other ICUs or on the progressive and floor units. This study included a sample size of 1000 participants. There were no biases on the basis of gender, race or ethical background. There was no cost to the patient.

A total of 525 patients met inclusion criteria for the study during February 1, 2019 to April 30, 2019 and a total of 504 patients met inclusion criteria for the study during July 1, 2019 to September 30, 2019. From these patients, the sample consisted of 200 randomly selected charts for data analysis; 100 from the pre-video cohort and 100 from the post-video cohort.

## **Data Collection**

Approvals from the University of Kentucky Institutional Review Board (IRB) and the healthcare system's Office of Research and Administration were obtained prior to data collection. Informed consent was waived due to low risk to patients, since this was a retrospective chart review. Data were gathered by Center for Clinical and Translational Science (CCTS) Honest Broker Analysts through review of the charts in Sunrise Clinical Manager

(SCM), the electronic medical charting system. Adherence to the patient education was tracked by CCTS Honest Broker Analysts in the Education tab of SCM. The data were collected over a 3-month time period after the HAPI videos were available to the GWN (July 1<sup>st</sup>, 2019 – September 30, 2019). Data were also collected during a pre-video time period (February 1<sup>st</sup>, 2019 - April 30, 2019) for comparison. The collected demographic variables included age, race, gender, ICU length of stay, hospital length of stay, the Charlson Comorbidity Index (CCI), Jackson/Cubbin pressure injury risk assessment score, the number pressure ulcers, and whether the HAPI videos had been viewed. Data were placed on a spreadsheet and all patient health information was removed. The electronic data were stored on a secured drive that was firewall protected. The information gathered in this project was demographic only. This was for comparison purposes and no specific patient information was shared. The only results shared were aggregate data.

After the initial data collection, it was discovered that re-education with the staff on the HAPI videos was needed due to low video compliance and no significant difference in pressure ulcer rates. Additional education by managers was provided to the nursing staff, and data were collected for comparison for a three-week pre and post period (pre-education from January 5, 2020 to January 25, 2020, and post-education from February 2, 2020 to February 22, 2020). This education once again informed staff of the automatic order set provided by a Jackson/Cubbin score of 36 or less. Additionally, the managers reminded staff to explain to patients that the videos are easy to watch, the videos are less than 4 minutes each, and stressed the importance of pressure ulcer prevention education to patients.

## **Data Analysis**

Data from the electronic spreadsheet were analyzed with the assistance of a statistician at the University of Kentucky College of Nursing. Frequency distributions, means and standard deviations were used for descriptive statistics to describe patient demographics. The two-sample t-test was used to compare age, Charlson Comorbidity Index, Glasgow Coma, and Jackson/Cubbin distributions. The chi-square test of association was used to determine differences in gender, race, number of pressure ulcers, and number of newly acquired pressure ulcers. The Mann-Whitney U-test was used to examine differences in hospital length of stay and ICU length of stay. A p level of 0.05 was used for statistical significance throughout.

## **Results**

### **Pre-Videos**

The sample population included a total of 525 patients who met inclusion criteria for the study during February 1, 2019 to April 30, 2019 and a total of 504 patients met inclusion criteria for the study during July 1, 2019 to September 30, 2019. A randomized sample of 100 was used from each cohort pre/post video for data analysis totaling 200 patients. The mean age for patients prior to the HAPI videos was 55 (SD=15), with 48% being male and 52% being female (Table 2). Caucasian patients represented the largest ethnic group (87%), followed by African Americans (10%), and Unreported (3%; Table 2). The Charlson Comorbidity Index average was 5.5 (SD=3.9; Table 3). The average Glasgow Coma Score was 11.23 (SD=3; Table 3). This score shows most of the patients had a decreased level of consciousness that could inhibit viewing of the HAPI videos. The average Jackson/Cubbin scale was 34 (SD=4.4; Table 3). The median ICU length of stay was 4 days and median hospital length of stay 9.5 days (Table 4).

The total number of pressure ulcers for the 3-month timeframe was 19 (Table 4). Only 2 were new pressure ulcers occurring within the ICUs. No videos were viewed at this time (Table 6).

### **Post-Videos**

The mean age for patients during the HAPI videos intervention was 57 (SD=15), with 64% being male and 36% being female (Table 2). Caucasian patients represented the largest ethnic group (89%), followed by African Americans (9%), and Unreported (2%; Table 2). The Charlson Comorbidity Index average was 5.4 (SD=3.5; Table 3). The average Glasgow Coma Score was 11.73 (SD=2.3; Table 3). Again, this shows most of the patients had a decreased level of consciousness. The average Jackson/Cubbin scale was 33.5 (SD=5; Table 3). The median ICU length of stay was 4 days and the median hospital length of stay was 8 days (Table 4). There was a significant difference in overall hospital length of stay after the HAPI videos were introduced (p-value 0.049; Table 4). A total of 103 patients were ordered the Pressure Ulcer Prevention video and 80 were ordered the Pressure Ulcer Treatment video (Table 7). Sixty-six people viewed the Pressure Ulcer Prevention video and 35 people viewed the Pressure Ulcer Treatment video (Table 7). The total number of pressure ulcers for the 3-month timeframe was 27 (Table 5). Only 1 was a new pressure ulcer occurring within the ICUs after the implementation of the HAPI videos (Table 5). Even though this was not significantly different from the pre-video data, only 1 new pressure ulcer development is a great accomplishment.

### **Pre-Reeducation**

Another set of data were collected. A total of 178 patients met the inclusion criteria for the second set of data: 83 pre-reeducation and 95 post-reeducation. The mean age for patients prior to re-education with the HAPI videos was 57 (SD=16), with 47% being male and 53% being female (Table 2). Caucasian patients represented the largest ethnic group (95%), followed

by African Americans (5%), and Unreported (0%; Table 2). The Charlson Comorbidity Index average was 5.03 (SD=3.5; Table 3). The average Glasgow Coma Score was 11.5 (SD=3.3; Table 3). The average Jackson/Cubbin scale was 33 (SD=4.5; Table 3). The median ICU length of stay was 3.64 days and median hospital length of stay 8 days (Table 4). A total of 26 patients were ordered the Pressure Ulcer Prevention video and 24 were ordered the Pressure Ulcer Treatment video (Table 8). Twelve people viewed the Pressure Ulcer Prevention video and 9 people viewed the Pressure Ulcer Treatment video (Table 8). The total number of pressure ulcers for the 3-week timeframe was 22 (Table 5). During this time, 3 new pressure ulcers occurred (Table 5).

### **Post-Reeducation**

The mean age for patients after re-education of the HAPI videos was 58 (SD=15), with 53% being male and 47% being female (Table 2). Caucasian patients represented the largest ethnic group (93%), followed by African Americans (4%), and Unreported (3%; Table 2). The Charlson Comorbidity Index average was 5 (SD=3.9; Table 3). The average Glasgow Coma Score was 11.4 (SD=3.5; Table 3). Again, this shows most of the patients had a decreased level of consciousness. The average Jackson/Cubbin scale was 33.6 (SD=4.2; Table 3). The median ICU length of stay was 3.43 days and median hospital length of stay 6 days (Table 4). Again, there was a significant difference in overall hospital length of stay (p-value 0.008; Table 4). A total of 28 patients were ordered the Pressure Ulcer Prevention video and 24 were ordered the Pressure Ulcer Treatment video (Table 9). Eight people viewed the Pressure Ulcer Prevention video and 6 people viewed the Pressure Ulcer Treatment video (Table 9). The total number of pressure ulcers for this 3-week timeframe was 19 (Table 5). During this time, 2 new pressure ulcers occurred (Table 5). The overall video compliance is displayed in Figure 1.

## Discussion

The purpose of this study was to evaluate the effectiveness of an educational video at preventing pressure ulcers for adult patients in the acute care hospital setting who are at risk for developing these ulcers. Specific aims of this project included examining any change in the incidence of pressure ulcer rates after implementing the HAPI videos education, examining any change in the total number of pressure ulcers before and after viewing the HAPI videos, and determining if the videos had been viewed. Even though there was no statistical significance in the number of pressure ulcers, both data sets showed an overall decrease in pressure ulcers in the post data collections with the use of the HAPI videos and after re-education of the videos. The overall incidence of new pressure ulcers obtained within the units was low in comparison to total pressure ulcers. Data also showed most pressure ulcers were acquired prior to hospital admission or prior to transfer into the ICUs.

The Charlson Comorbidity Index (CCI) is a validated measure to assess a patient's 1-year mortality risk due to the confounding influence of disease (Roffman, Buchanan, & Allison, 2016). It consists of 17 comorbidities, each scoring 1 to 6 for disease severity and then summed to produce a total CCI score (Roffman, Buchanan, & Allison, 2016). Scores  $\geq 5$  have been associated with a 1-year mortality (Roffman, Buchanan, & Allison, 2016). The CCI for all cohorts of data collected averaged around 5 to 5.5. Therefore, the scores indicated a 1-year mortality risk for this patient population due to their comorbidities.

Many videos were left unviewed, which could be due to the decreased level of consciousness experienced by patients. Several times, only the first video was viewed and not the second. There was also an issue with videos not being ordered for all patients scoring 36 or less on the Jackson/Cubbin score. Also, the "Pressure Ulcer Prevention in the Hospital" video

was ordered more frequently than the 2 videos together. There was no change in median ICU length of stay but there was a statistically significant decrease in hospital length of stay. Even though the results were not significantly changed the HAPI videos are still saving time for the nursing staff.

## **Limitations**

Several limitations were identified in this study. Since data were extracted by retrospective and prospective chart review, the accuracy of data was highly dependent on the documentation skills of the nursing staff. Therefore, information could have been missed if it was not documented. This was a short timeframe of data collection, a large sample size with low adherence, a single service line study, and a single center study focusing on the University of Kentucky patients. Several populations of patients were left out in this study. Patients may have been unwilling to watch the video due to several factors, including not wanting to use technology or not wanting to educate themselves. Lack of awareness of pressure ulcer severity and consequences is a possible limitation. Physical barriers may exist for patients as well, such as low literacy or the inability to see or hear. Another physical barrier could be a decreased level of consciousness. System barriers can also occur, such as a faulty internet connection, a non-working television, or glitches with the videos themselves. Another limitation was the videos were not consistently ordered together. There was a higher frequency of ordering for the “Pressure Ulcer Prevention in the Hospital” video than the “Pressure Ulcer Treatment” video. There is also a lack of research on the use of video education for patients and pressure ulcer reduction. Some nursing barriers include the nurse’s unwillingness to use the video education, lack of compliance, and a resistance to change from the nursing staff. Time constraints due to high patient acuity or low staffing may also prohibit education.

## **Implications for Practice**

The use of video-streaming education is an attractive tool for acute care hospital patients. There are current plans to expand the GWN and the HAPI videos to other service lines of the University of Kentucky Hospital. It might be beneficial to implement the HAPI videos to all patients admitted to the ICU, not just those who score a 36 or less on the Jackson/Cubbin scale. Formal education on the HAPI videos would be beneficial to providers as well as staff.

The ease and availability of the GWN to view educational videos at the patient's convenience make this system a great means for education. The GWN has a bank of videos patients can search and learn about topics of their choosing. The system can be accessed any time day or night. This use of education allows for consistency in information provided.

## **Recommendations for Future Research**

This study has highlighted the need for more research surrounding pressure ulcers. With rising demands of the bedside nurse, there is opportunity for research on video education. Is there a correlation with number of staff and incidence of pressure ulcers? It is important to provide formal education and awareness of the HAPI videos to staff and providers. It would be beneficial to utilize a Pre/Post-Test to assess knowledge after formal teaching. Surveys can also be provided to nursing staff to identify ease of video education. Surveys are important to identify barriers for using, ordering, or promoting the viewing of the videos and the GWN. Surveys could also be provided to patients to identify barriers to video education. It is important to identify the ways in which information makes an impact on patients. Identifying patients' thoughts about the videos and how the videos can be improved may be an effective way to address issues for better adherence. It would also be beneficial to patients to increase

accessibility by allowing patients to view the educational videos on their personal electronic devices. Identifying patients based on their comorbidities to highlight their risk for developing a pressure ulcer. This could be a predictor alert for patient groups requiring extra precautions based on their comorbidity.

## **Conclusion**

The purpose of this study was to evaluate the effects of implementing pressure ulcer education videos at a major healthcare system. As pressure ulcer rates continue to increase in the healthcare setting there is a need for patient education and prevention. This can be accomplished through the use of the pressure ulcer prevention videos on the GWN at the University of Kentucky. Reducing the number of pressure ulcers and preventing the formation of new ones can be accomplished through increasing patient education with the pressure ulcer prevention video. The average cost of one pressure ulcer is approximately \$60,857.38 and the average cost of one day's worth of care in the ICU is approximately \$1324 (Fernandes Costa Lima et al., 2015; Aung et al., 2020; Table 9). The data collected showed an average of 1.5 to 2 days shorter length of stay after the utilization of the HAPI videos and re-education of the videos. Factoring in the average cost of one pressure ulcer, the potential cost savings for prevention of one pressure ulcer amounts to \$62,843.38 – \$63,505.38. The pressure ulcer prevention video is an important intervention because of the detriment pressure ulcers cause. It is important to increase the involvement of patient's in their own care and increase their self-efficacy. Ultimately, the quality of care provided to the patients did not change or become inhibited with the implementation of the HAPI videos. The videos allowed standardization of education provided to patients and allowed for more time to be allocated to direct nursing care instead of teaching.

By preventing the formation of pressure ulcers, patients will be free of the pain caused, shorten their hospital stays, decrease medical expenses and improve outcomes.

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Table 1: Jackson/Cubbin Pressure Ulcer Risk Scale

Age (years)	Score point	Hemodynamics	Score point
<40	4	Stable without inotropes	4
40-54	3	Stable with inotropes	3
55-70	2	Unstable without inotropes	2
>70	1	Unstable with inotropes	1
Weight/tissue viability		Respiration	
Average weight BMI 18-25.9 kg/m <sup>2</sup>	4	Spontaneous	4
Obese 26-39.9 kg/m <sup>2</sup>	3	Non-invasive, CPAP/BiPAP	3
Cachectic <18 kg/m <sup>2</sup>	2	Mechanical ventilation	2
Any of the above plus severe edema or >40 kg/m <sup>2</sup>	1	Mechanical ventilation, No spontaneous breathing	1
Past medical history		Oxygen requirements	
None	4	Requires <40% O <sub>2</sub> , stable on movement	4
Mild	3	Requires 40%-60% O <sub>2</sub> , stable on movement	3
Severe	2	Requires 40%-60% O <sub>2</sub> , stable ABGs but desaturates on movement	2
Very severe	1	Requires 60% O <sub>2</sub> or above. Inability to maintain ABGs/desaturates at rest	1
General skin condition		Nutrition	
Intact	4	Full diet + fluids	4
Red skin affecting areas prone to pressure	3	Clear IV fluids only	3
Grazed/excoriated superficial skin areas	2	Light diet, oral fluids, enteral feeding	2
Deep wounds, necrotized or heavily exudating wounds	1	Parenteral feeding	1
Mental condition		Incontinence	
Awake and alert	4	None/anuric/catheterized (urine and/or feces catheter)	4
Agitated/restless/confused	3	Urine/profound sweating	3
Apathic/sedated but responsive	2	Feces/occasional diarrhea	2
Coma/unresponsive/paralyzed and sedated	1	Urine and feces /prolonged diarrhea (≥3 times/day)	1
Mobility		Hygiene	
Walks with help	4	Independent	4
Very limited, chairbound	3	Needs assistance	3
Immobile but tolerates change of position	2	Needs much assistance	2
Unable to tolerate movement, nursed prone	1	Fully dependent	1
Deduct points			
Deduct 1 point, if patient has been in surgery or transported to CT, MRI or HBOT during the last 48 hours			
Deduct 1 point, if patient has required blood or clotting factors during last 24 hours			
Deduct 1 point, if patient has hypothermia of 35°C or under (core temperature)			

Table :2 Demographics						
	Data set 1		<i>p</i>	Data set 2		<i>p</i>
	Pre-Videos mean (SD) or n (%)	Post-Videos mean (SD) or n (%)		Pre-Reeducation mean (SD) or n (%)	Post-Reeducation mean (SD) or n (%)	
Age	55 (15)	57 (15)	.45	57 (16)	58 (15)	.50
Gender			.02			.45
Male	48 (48%)	64 (64%)		39 (47%)	50 (53%)	
Female	52 (52%)	(36%)		44 (53%)	45 (47%)	
Race			.87			.09
Black	10 (10%)	9 (9%)		4 (5%)	3 (4%)	
White	87 (87%)	89 (89%)		79 (95%)	87 (93%)	
Unreported	3 (3%)	2 (2%)		0 (0%)	5 (3%)	

Table 3. Characteristics						
	Data set 1		<i>p</i>	Data set 2		<i>p</i>
	Pre-Videos mean (SD) or n (%)	Post-Videos mean (SD) or n (%)		Pre-Reeducation mean (SD) or n (%)	Post-Reeducation mean (SD) or n (%)	
Charlson Index	5.5 (3.9)	5.4 (3.5)	.816	5.03 (3.5)	5.0 (3.9)	.981
Glasgow coma Score	5.51 (3.1)	6.18 (3.8)	.41	6.35 (4)	7.3 (4.1)	.11
Min	14.23 (2.7)	14.6 (1.3)	.43	13.9 (2.4)	13.7 (3)	.53
Max	11.23 (3)	11.73 (2.3)	.41	11.5 (3.3)	11.4 (3.5)	.87
Mean						
Jackson/Cubbin Scale						
Min	29 (4.1)	29.5 (3.6)	.56	28.2 (4.5)	28.5 (4.8)	.71
Max	38.9 (6)	37.8 (6.9)	.48	37.6 (5.6)	38.2 (5.2)	.46
Mean	34 (4.4)	33.5 (5)	.63	33 (4.5)	33.6 (4.2)	.37

	Data set 1		<i>p</i>	Data set 2		<i>p</i>
	Pre-Videos Median (IQR) or n (%)	Post-Videos Median (IQR) or n (%)		Pre- Reeducation Median (IQR) or n (%)	Post- Reeducation Median (IQR) or n (%)	
ICU Length of Stay	4 days (3 – 8 days)	4 days (1 - 8 days)	.214	3.64 days (1.82 - 6.12 days)	3.43 (1.79 - 5.81 days)	.871
Hospital Length of Stay	9.5 days (5 - 18 days)	8 days (4 - 13 days)	.049	8 days (4 - 13.75 days)	6 days (3 - 9.75 days)	.008

	Data set 1		<i>p</i>	Data set 2		<i>p</i>
	Pre- Videos mean (SD) or n (%)	Post- Videos mean (SD) or n (%)		Pre- Reeducation mean (SD) or n (%)	Post- Reeducation mean (SD) or n (%)	
			.39			.79
Total # Pressure Ulcers	19	27		22	19	
New Incidence # Pressure Ulcer	2	1		3	2	

	9200			10200		
	Viewed	Ordered	Compliance	Viewed	Ordered	Compliance
Pressure Ulcer Prevention	0	0	0%	0	0	0%
Pressure Ulcer Treatment	0	0	0%	0	0	0%

	9200			10200		
	Viewed	Ordered	Compliance	Viewed	Ordered	Compliance
Pressure Ulcer Prevention	31	51	61%	35	52	67%
Pressure Ulcer Treatment	16	41	39%	19	39	49%

Table 8: Pre-Reeducation Jan 5, 2020 to Jan 25, 2020						
	9200			10200		
	Viewed	Ordered	Compliance	Viewed	Ordered	Compliance
Pressure Ulcer Prevention	6	12	50%	6	14	43%
Pressure Ulcer Treatment	5	11	45%	4	13	31%

Table 9: Post-Reeducation February 2, 2020 to February 22, 2020						
	9200			10200		
	Viewed	Ordered	Compliance	Viewed	Ordered	Compliance
Pressure Ulcer Prevention	6	18	33%	2	10	20%
Pressure Ulcer Treatment	4	14	29%	2	10	20%

Table 10: Cost Analysis	
Average cost of a pressure ulcer	\$60,857.38
Average cost of a day in ICU	\$1324

