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Health Literacy and the Feasibility of Using Video-Based Education in the Emergency Department

Jenifer Carvell

HEALTH LITERACY AND THE FEASIBILITY OF USING VIDEO-BASED EDUCATION IN THE EMERGENCY DEPARTMENT

By

Jenifer Carvell

Bachelor of Science in Nursing
University of Alabama in Huntsville
2000

Master of Business Administration
Webster University
2004

Master of Science in Nursing
University of Nevada, Las Vegas
2015

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Jenifer Carvell

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Kathleen Thimsen, D.N.P.
Examination Committee Chair

Alyssa Crittenden, Ph.D.
Vice Provost for Graduate Education and Dean of the Graduate College

Mina Attin, Ph.D.
Examination Committee Member

Andreas Stefik, Ph.D.
Graduate College Faculty Representative

Abstract

Background: The Department of Health and Human Services (HHS) defines health literacy as the degree to which an individual has the capacity to find, understand, and use information and services to inform health-related decisions and actions for themselves and others. In the emergency department (ED), it is estimated that the prevalence of inadequate health literacy can reach as high as 88 percent. There is a need to implement literacy-sensitive interventions in the ED. **Purpose:** The purpose of this project was to engineer an intervention that explored the feasibility of the use of personal technology to deliver video-based education to adult patients with undifferentiated levels of health literacy in a community ED to improve comprehension of material and assess satisfaction with the discharge method. The use of personal devices has become integral to the dissemination of information and utilizing this technology was postulated to improve access to health information in the ED environment. **Method:** An education tool was designed to be accessed by a personal device, such as a smart phone or tablet, via QR code and was used to deliver educational videos to patients presenting to the ED with back pain. Collection and analysis of data from health literacy assessment, pre-and posttest comprehension of material, and a survey of preference/satisfaction was conducted. **Implications for Practice.** Improving the delivery of patient education in the ED may improve communication of key health aspects to individuals with inadequate health literacy and improve comprehension and satisfaction with delivery method.

Keywords: health literacy, back pain, discharge instructions, emergency department, video education, patient education

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Chapter I

Health literacy is the degree to which an individual has the capacity to find, understand, and use information and services to inform health-related decisions and actions for themselves and others (HHS, 2010). An individual's ability to comprehend health information can play a powerful role in how well they manage their health. It has been found that only 12 percent of English-speaking adults have the proficient health literacy skills that allow them to navigate the healthcare system and perform the more challenging and complex tasks of understanding health information, following through with medical instructions, and adhering to medical advice; while almost half of all adults lack the literacy skills needed to function adequately in the health care environment (HHS, 2010). Individuals with inadequate health literacy would have difficulty with common health tasks such as reading a prescription label, filling out insurance paperwork, or adhering to a child immunization schedule using a chart (HHS, 2010). Inadequate health literacy affects nearly 80 million adults in the United States and is more common among older populations, ethnic minority groups, people living in poverty, and persons with less than a high school education (Ylitalo et al., 2018). Individuals presenting with limited abilities to interpret and access healthcare resources leads to increased healthcare utilization and costs the United States an estimated $100 to $236 billion every year (McIntyre et al., 2010).

In the emergency department (ED), it is estimated that the prevalence of inadequate health literacy can reach as high as 88 percent, depending on the patient mix (Griffey et al., 2014). Low health literacy is associated with higher ED utilization and higher rates of return within 14 days, particularly for low-acuity complaints (Samuels-Kalow et al., 2016; Wray et al., 2021). In 2018, disorders of the musculoskeletal system accounted for almost eight percent of non-acute, treat-and-release diagnoses out of 123 million visits to the ED (Weiss & Jiang, 2021).

Among musculoskeletal disorders, low back pain causes the highest burden of prevalence, affecting 568 million people, and is a leading cause of activity limitation, work absence, and disability (Edward et al., 2018; World Health Organization [WHO], 2021). Effective self-management is necessary to improve back pain outcomes and there is a need to focus on health literacy to develop effective patient education materials to support self-management in this population (See et al., 2021). These low-acuity ED visits present an opportunity to engage patients in their medical care and offer a chance to deploy universal literacy-sensitive precautions and to test literacy-sensitive interventions (Balakrishnan et al., 2017; Sheele et al., 2019).

Problem Significance

Providing high-quality discharge education presents a challenge in the ED. In an often chaotic and stressful environment, patients frequently have a difficult time retaining complex information explained in brief interactions (Hoek et al., 2020). Discharge from the ED is a period of significant vulnerability for patients and the Agency for Healthcare Research and Quality (AHRQ) has identified ED discharge as a crucial time to receive appropriate preparation for a patient's return home so that they can properly manage their recovery (Johns Hopkins University, Armstrong Institute for Patient Safety and Quality, 2014). Transitions of care in the ED at the time of discharge are high-risk for miscommunication to occur between the patient and their healthcare provider and can detrimentally affect patient health outcomes, self-management behaviors, and health beliefs (Edward et al., 2018; Griffey et al., 2014). However, ED providers are often rushed or distracted leaving little time to provide clarity and consistency, averaging only 76 seconds per discharge encounter (Samuels-Kalow et al., 2016). Written instructions are problematic when the readability of medical information is often written at a level that is too

complex for most patients to understand (Eltorai et al., 2014). Discharge failures occur when patients are not given complete information and individuals with inadequate health literacy are at particular risk if they cannot comprehend the instructions they were given (Johns Hopkins University, Armstrong Institute for Patient Safety and Quality, 2014).

The AHRQ conceptualizes high-quality ED discharge to contain three main characteristics: (a) it informs and educates patients on their diagnosis, prognosis, treatment plan, and expected course of illness; (b) it supports patients in receiving post-ED discharge care, to include medication management, self-management, further diagnostic testing, and further health care provider evaluation; and (c) it coordinates ED care within the context of the health care system, meaning the patient's needs and preferences are known and coordinated with the right organizations at the right time (Johns Hopkins University, Armstrong Institute for Patient Safety and Quality, 2014). For patients with inadequate health literacy, needs that have been found to be unmet at the time of ED discharge were identified as the use of more simplified language, an increase in visual learning and demonstration, more protected tine for communication, and the desire for more complete information (Samuels-Kalow et al., 2016). One study showed complete information about diagnosis, expected course of illness, self-care, use of medications, time-specified follow-up, and symptoms that should prompt return to the ED were given only 65 percent of the time (Rhodes et al., 2004). To prevent discharge failures, the ED provider must effectively communicate all crucial information, verify comprehension, and tailor teaching to areas of confusion or misunderstanding to ensure patient safety when they are dispositioned back to their home (Samuels-Kalow et al., 2016).

The ability to engage in effective self-management is dependent on an individual's ability to understand and assess health information (Edward et al., 2018). Low health literacy often has

an association with poor health outcomes such as low levels of self-efficacy, increased mortality, poor health status, and reduced quality of life (Zheng et al., 2018). Conditions, such as back pain, that require self-care skills and close adherence to treatment regimens are at high risk for poor health outcomes, such as the progression of disease and poor symptom management, provoking higher utilization of healthcare resources in lower health literacy groups (Edward et al., 2018). Perceptions of back pain, regarding intensity and pain control, have been found to be worse in patients with limited health literacy (See et al., 2021).

Patient preferences for discharge communication are also an important predictor for how well patients will receive and comprehend information (Samuels-Kalow et al., 2016). Examining the use of technology in patient education has become more significant with the widespread use of personal devices, such as smartphones and tablets. The role of these devices has become increasingly common and has transformed the way we interact with others in our daily lives (Alexander et al., 2021). Applications directing patients to video-based education can be particularly effective in standardizing information and improving satisfaction with the delivery of the information (Villamin & Berg, 2018). The potential to engage and influence patient behaviors through technology-enhanced applications can improve the delivery of health information and should be further explored to improve the way we discharge patients from the ED.

Purpose

The purpose of this Doctor of Nursing Practice (DNP) project is to determine the feasibility of an intervention to use personal technology to deliver video-based education to adult patients with undifferentiated health literacy in a community ED to assess comprehension of material and satisfaction with the education method. As back pain is a medically important and

common complaint, this diagnostic group will be the focus to evaluate the efficacy of the intervention.

Usual practices in the emergency department for discharge information include verbal and/or written instructions, but studies have shown that this information is frequently misunderstood or poorly retained (Sheele et al., 2019). Verbal instructions are provider specific and there is no framework or consistency in the information relayed (Sheele et al., 2019). Written instructions are often too complex for most patients with inadequate health literacy to comprehend (Eltorai et al., 2014). Alternative formats for the provision of information in the ED, such as the use of videos, can improve the quality of discharge information given, how it is given, and how it is received within the limitations of time and environmental distractions within the department and can improve patient outcomes. This project aims to bridge the gap in current practice to optimize the delivery of health information within a busy ED environment.

Chapter II

Review of Literature

Literature Search Methods

A literature search was conducted using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane, PubMed, and Education Resources Information Center (ERIC) databases as depicted in Appendix A, Tables A1 through A4. Search strategies were directed towards interventions aimed to address disparities in health literacy in the ED. Keywords “health literacy”, “emergency services”, “patient education”, and “intervention” were used. The targeted diagnoses of “musculoskeletal pain” and “back pain” were also used as keywords, however these terms limited the results in most instances indicating a disparity in literature for these common diagnoses. Other synonyms used for “patient education” included “discharge education” and “health information”, which were often used interchangeably with synonyms for “health literacy”, “health beliefs”, “comprehension”, and “understanding”. Preliminary literature searches revealed a common theme for interventions using technology and video interventions in the ED setting, which elicited a search strategy to include “technology”, “video instruction”, and “video discharge”. Inclusions and exclusions for each search strategy are listed in the table notes.

Only articles that directly applied a patient education intervention to improve comprehension of material were used. All search results were evaluated for relevancy and studies that did not appropriately address the PICOT question were excluded. A total of 15 studies were retained and included 10 randomized control trials (RCTs), three systematic reviews, one meta-analysis, and one cohort study. Literature included dates from 2012 to 2021 and most studies

were conducted in the U.S. All studies were in English. A table of evidence and further synthesis of material is depicted in Appendix A, Figures A1 and A2.

Synthesis of Literature

Literature addressing interventions applied to overcome barriers of inadequate health literacy and improve understanding of health information was reviewed for application to an ED population. A systematic review performed by Edward et al. (2018) looked at studies utilizing direct and indirect measures of health literacy and the applicability to patients with back pain and their adherence to an education program, self-care management, and rehabilitation. They found only three studies meeting criteria but determined an association between low health literacy levels and health management to include less information seeking and poorer attitudes towards self-management. This was the only review directly aimed towards the impact of health literacy on the given diagnosis of back pain and is critically important in revealing the underlying paucity of literature that exists surrounding this topic. A further study initiated by See et al. (2021) recognized that back pain is an increasingly important diagnosis to focus interventions for self-management due to the widespread economic burden and disability of the disease. They performed a scoping review that expanded on Edward et al.'s (2018) work to broaden the body of literature and found a significant association for individuals with low health literacy in the category of increased perceived pain intensity. They also associated low health literacy with higher utilization of emergency department visits and lower utilization of preventive medicine (See et al., 2021).

Few studies used direct measures of health literacy and relied upon indirect measures, such as education level and socio-economic demographics. The tools used to measure health literacy were the Test of Functional Health Literacy in Adults (TOFHLA), the Short Test of

Functional Health Literacy in Adults (s-TOFHLA), the Rapid Estimate of Adult Literacy in Medicine - Revised (REALMS-R), and the Newest Vital Sign (NVS) (Giuse et al., 2012; Goessl et al., 2019; Griffey et al., 2014; McCarthy et al., 2012). The TOFHLA is considered the most comprehensive reference standard, consisting of a 50-item reading and 17-item numeracy ability test that can take up to 22 minutes to administer. This tool was used to stratify individuals into groups of low, marginal, and adequate health literacy in an academic internal medicine clinic to associate measures of comprehension and recall after an educational intervention (McCarthy et al., 2012). This tool is not feasible in the ED environment secondary to time constraints and environmental factors that place limitations on administering questionnaires. The s-TOFHLA is a briefer version of the TOFHLA consisting of 36 items and taking approximately 12 minutes to administer. This tool was used by Guise et al. (2012) in an academic emergency department for the first arm of an experiment which assessed the effects of information customized to health literacy level on retention of information. However, they found that time constraints during ED discharge made this tool cumbersome to use in the ED environment and replaced it with the Chew et al. (2008) screening question for self-reported difficulty of understanding health information during the second arm of their experiment. Asking the question, *"How often do you have someone help you read hospital materials?"* was shown to perform equally as well as the s-TOFHLA in identifying patients with inadequate health literacy (Chew et al., 2008). The REALMS-R test is a word recognition test that is made up of 11 health-related items that must be read and pronounced accurately by the patient. This measure was used in association with a teach-back intervention deployed in an ED at time of discharge by a research assistant (Griffey et al., 2015). Performance of this measure requires an interview style interaction that may not be feasible in busy settings. Finally, the NVS tool consists of being able to read and interpret the

information on a nutrition label and it requires approximately three minutes to administer. This tool was also developed to be given as an interviewer administered assessment to reduce the complexity of the individual having to read the questions on their own, however a computer presentation with voice-over narration that provides participants with visual and oral instructions was found to provide the same validity (Weiss, 2018). This tool was utilized by Goessl et al. (2019) during an outpatient class intervention to associate health literacy with recall of information.

Different methods of relaying health information were reviewed to determine improvements in comprehension and recall. These included verbal instructions (Griffey et al., 2015; Hoek et al., 2020; McCarthy et al., 2012), written materials (Giuse et al., 2012; Hoek et al., 2020), videos (Atzema et al., 2013; Bloch & Bloch, 2013; Goessl et al., 2019; Goodman et al., 2015; Hoek et al., 2020; Hoek et al., 2021; Ismail et al., 2016; Jové-Blanco et al., 2020; Wilkin, 2020; Wray et al., 2021), and pictograms (Dermody et al., 2021). All patients discharged from the ED normally receive some form of verbal discharge instructions, however, recall of material has been shown to be as low as eight percent when not given with any supplemental materials (Hoek et al., 2020). Improvements in recall were shown to improve by 15 percent when verbal instructions were supplemented with teach-back techniques (Hoek et al., 2020). Teach-back techniques prompt the patient to recite back information provided at the time of education to check understanding of material (Griffey et al., 2015). The use of pictograms, as a form of information sharing, has also been shown to simplify discharge instructions (Dermody et al., 2021). Pictograms incorporate illustrations and symbols to augment information in a clear and straightforward way. Both teach-back methods and simplified information, such as pictograms, have been shared as ‘best practice’ strategies by the AHRQ (HHS, 2010). Other supplemental

materials, such as written discharge instructions, are standard in the ED, however, are often at an inappropriately high reading level. The average ED patient reads at the sixth-grade level and printed discharge instructions were found to be as high as the eleventh grade reading level (Samuels-Kalow et al., 2016).

When comparing the interventions of verbal, written, and video format, Hoek et al. (2020) performed a systematic review and meta-analysis of 51 studies showing recall of information was greater in patients who received video information over written and verbal formats. Other studies specifically targeting the use of video instruction have been consistent in finding significance with improved comprehension and recall of information (Atzema et al., 2013; Bloch & Bloch, 2013; Ismail et al., 2016; Jové-Blanco et al., 2020; Wilkin, 2020). This intervention has been particularly successful for caregivers of pediatric patients discharged from the ED (Bloch & Bloch, 2013; Ismail et al., 2016; Jové-Blanco et al., 2020). Utilizing technology to deliver information is one way to offset communication deficiencies due to lack of time. Atzema et al. (2013) created a library of video education for common ED diagnoses and found patients scored higher on understanding of key concepts of diagnosis and subsequent care. Another systematic review revealed healthcare providers and patients favored technology-enhanced interventions for relaying information over person-based and written communication (Newnham et al., 2017).

Satisfaction with the discharge instruction varied between interventions. Griffey et al. (2015) utilized a teach-back technique in the ED and found no difference in satisfaction between groups receiving standard discharge and the teach-back intervention. Assumptions that the protected time the teach-back group received would improve satisfaction were not met, however it was theorized that the additional time this method takes in the ED can impact bed turnover and

throughput in a busy environment causing overall dissatisfaction. Dermody et al. (2021) performed a systematic literature review to evaluate the benefits of simplifying instructions using pictorial discharge advice. Findings were in favor of improving comprehension and satisfaction with the advice, but not satisfaction with the overall ED visit when compared to standard discharge. Measured outcomes finding improved satisfaction with video education over standard discharge were found in several studies and suggest video discharge is preferred to standard method and adds value to the patient (Atzema et al., 2013; Goessl et al., 2019; Hoek et al., 2021; Jové-Blanco et al., 2020).

Preferences and health beliefs are key determinants to driving behavioral change. Giuse et al. (2012) used learning style preferences to tailor specific discharge instructions to include visual, aural, read/write, and kinesthetic options. They found that comprehension through post-test performance was greater in patients who received materials matched to both their literacy level and learning preference than those who received information customized to health literacy alone. This was studied by Goodman et al. (2015) in the context of providing a video education intervention about vaccinations to a pregnant population in an outpatient clinic to which effectively influenced the health beliefs of safety and efficacy. However, these changes in health beliefs did not influence the health behavior of getting the vaccination. Through systematic review Edward et al. (2018) also found preferences in health instruction can improve health beliefs identified by an increase in information seeking behaviors in lower literacy groups.

There is a paucity of literature available addressing health literacy interventions for the improved comprehension and management of musculoskeletal back pain (Edward et al., 2018). Several studies have explored this topic on a variety of other diagnostic groups. Atzema et al. (2013) applied video discharge instructions to 38 different diagnoses. Although results between

diagnoses were variable, they found an overall improvement in subject test scores in the video intervention group compared to the control group using standard discharge. Bloch and Bloch (2013) incorporated video discharge instructions for pediatric patients with fever, vomiting/diarrhea, and asthma. Scores indicating improved understanding of instructions were significantly improved for the fever and vomiting/diarrhea groups, however there was no difference in the asthma group. This was attributed to the possibility that those with chronic conditions, as opposed to acute conditions, had a pre-existing familiarity with the disease process and would not readily measure an improvement in comprehension. Similar results for improved comprehension were found in other studies examining fever, closed head injury, vaginal bleeding in early pregnancy, acute gastroenteritis, upper respiratory infection, and pharyngitis (Ismail et al., 2016; Jové-Blanco et al., 2020; Wilkin, 2020). Inconsistent with this trend in results were the studies conducted by Hoek et al. (2021) and Wray et al. (2021) which found no statistical significance in recall of information for patients with mild traumatic brain injury, laceration care, and splint care after video discharge intervention.

Health literacy is dependent upon the availability, accessibility, and appropriateness of health information. Patients with higher health literacy skills are more likely to get health information from written sources, such as books, brochures, or the internet; while patients with low health literacy skills rely upon television or radio (Kutner et al., 2006). Sources cite ED crowding (Atzema et al., 2013), lack of time (Atzema et al., 2013; Bloch & Bloch, 2013; Wilkin, 2020), varying communication skills of healthcare providers (Bloch & Bloch, 2013), and the heterogeneity and differing health literacy levels of the average ED population (Ismail et al., 2016) as barriers to the understanding of discharge instructions. Innovations in technology and the use of social and digital media through personal devices has become a preferred method for

accessing health information and there is a growing body of literature reporting on the potential and the effectiveness of intervention initiatives (Levin-Zamir & Bertschi, 2018).

Synthesizing the results of this literature review finds that video-based methods of education can augment verbal and written instructions in the improvement of comprehension and recall of health information in lower health literacy groups. Interventions, such as video-based discharge instructions, have been generally well-received and improve patient satisfaction with discharge methods in the ED environment. This method is also valued by providers and patients as it can overcome the time constraints and crowding issues that impact understandability of health information at time of discharge. Findings show commonalities in outcomes between different diagnostic groups, however, there is a shortage of information directly relating these modalities to individuals with back pain.

Needs Assessment and Description of Project

Population Identification

Health literacy in the adult population is important because the tasks of finding health care, interpreting health information, and maintaining health depend on understanding written information. Defined levels of ability for health literacy vary by organization, but the U.S. Department of Education has defined proficient literacy as skills needed to perform complex and challenging activities like finding information to define a medical term by searching through a complex document, calculating insurance costs using a categorical table of income versus family size, and evaluating information to determine which legal document is applicable to a health care situation (Kutner et al., 2006). While individuals with low, or inadequate, levels of health literacy would have difficulty locating providers and services, filling out complex health forms, sharing their medical history with providers, seeking preventative health care, knowing the

connections between risky behaviors and health, managing chronic conditions, and understanding directions on a bottle of medicine (Health Resources and Services Administration, 2019).

Individuals with adequate or high levels of overall literacy can still have low levels of health literacy and other factors, such as verbal fluency, can often mask the inability to interpret written material (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). Medical providers are often unaware of their patient's literacy levels and many patients do not volunteer that they have difficulty understanding medical information (Powers et al., 2010). Social determinants of health, such as poverty, education level, race/ethnicity, age, and disability can influence an individual's health literacy (ODPHP, n.d.). Factors of poverty, such as uninsured or underinsured, and elderly Medicare beneficiaries are at higher risk of having low health literacy and are often found to have higher medical costs, increased ED visits, more hospitalizations, and decreased access to healthcare (ODPHP, n.d.). Disparities in health literacy are found amongst racial, ethnic, and cultural backgrounds, with Hispanic adults having the lowest average health literacy scores of all groups (ODPHP, n.d.).

Stakeholders

A stakeholder is anyone who is affected by a problem or its solution and can influence the success or failure of the project (Chartier et al., 2017). Stakeholders for this project have been identified as both internal and external to the ED. Internal stakeholders include the medical providers, nursing staff, and the patients and families. The medical staff includes physicians and advanced practice providers (APP)s. APP is used as a collective term for nurse practitioners and physician assistants. These individuals lead the care of the patient by assessing, evaluating, diagnosing, and guiding the treatment of the ED patient. The medical providers determine

whether the patient can be dispositioned to home safely or if they need to be admitted to the hospital for further intervention or evaluation. If the patient is dispositioned to home, medical providers will provide verbal education. Verbal explanations are not standardized, and content and delivery vary amongst providers. The medical provider will also generate the written instructions within the electronic medical record (EMR) that include referrals for primary or specialty follow up and patient education sheets dedicated to the discharge diagnosis. Further support is garnered by the ED nursing staff. The nurses have multiple points of contact with the patient throughout the encounter to administer care and carry out orders from the medical staff. The first point of patient contact is the triage nurse who carries out the initial patient interview to determine the cause of the visit and stratify the patient into a level of acuity based upon a primary evaluation. At the time of discharge, the nursing staff will print the written instructions from the EMR that are generated by the medical provider and will often augment these written instructions with further verbal explanation of diagnosis, results, and needed follow-up. This education varies between nurses and can be influenced by the level of professional experience and medical knowledge. The ED patient and their families are the most important stakeholders as their overall care and health outcomes are affected by the processes and interactions throughout the ED encounter. At the time of ED discharge, the patient is the recipient of the discharge instructions and their ability to process and utilize the information given is integral to this project. Preferences for how the information is delivered factors into how the patient receives and interprets communication. Family or other support members, when present, are included in the discharge process and may or may not be an advocate for the patient to clarify or aid in interpretation of any information given.

External stakeholders include ED and hospital leadership and program managers for patient safety and patient experience. Medical and nursing staff work collaboratively with administrative groups to form and carry out policies that align with quality metrics and safety incentives to improve patient outcomes. These departments would hold an interest in the implementation of this project as change to patient outcomes and patient satisfaction may be impacted. The office of risk management is also a consideration, however due to the low risk for legal implications of the project a low level of interest is anticipated to come from this department.

Organizational Assessment

National initiatives prompt organizational alignment with patient safety and satisfaction goals that support strategies to improve the content and quality of patient education, such as the *National Action Plan to Improve Health Literacy*, *Healthy People 2020,* and the Institute of Medicine's *Health Literacy: A Prescription to End Confusion* (Ylitalo et al., 2018). The Agency for Healthcare Research and Quality (AHRQ) funded a report for patient safety and quality that has defined key indicators of high-quality ED discharge (Johns Hopkins University, Armstrong Institute for Patient Safety and Quality, 2014). These indicators include instructions that: (a) inform and educate patients on their diagnosis, prognosis, treatment plan, and expected course of illness, including informing patients of the details of their visit, (b) support patients in receiving post-discharge care, including medications, home care, use of medical devices, further diagnostic testing, and further healthcare education, and (c) coordinates ED care within the context of the healthcare system. Utilizing these factors, a recent study has shown that after ED discharge (a) many patients did not receive complete instructions, (b) only one third understood their diagnosis

and treatment, (c) only one fourth understood follow-up instructions, and (d) over one half had no understanding of when to return to the ED (Sheikh et al., 2018).

The National Action Plan to Improve Health Literacy was developed in 2010 by the U.S. Department of Health and Human Services to address a systems level change in the way health information is delivered. It operates on the premise of two concepts: (a) all people have the right to health information that helps them make informed decisions and (b) health services should be delivered in ways that are easy to understand to improve health, longevity, and quality of life (HHS, 2010). Other federal policy initiatives within the Affordable Care Act of 2010 and the Plain Writing Act of 2010, have also called attention to the impacts that health literacy has on healthcare access, quality, and cost (Koh et al., 2012). The impact of federal initiatives to improve patient understanding can be implemented at the local level as the premise of this project to direct activities that disseminate health information in an accessible format.

Project Scope

The focus of this project is to implement a quality improvement strategy to improve how discharge information is communicated and received in the ED. The literature supports the use of video-based discharge instructions to improve the comprehension of material for individuals with inadequate health literacy and improve overall satisfaction with the discharge process. This project will target English-speaking, adult patients 18 years and older who present for evaluation in the ED for musculoskeletal back pain. Musculoskeletal back pain is a nonspecific term that encompasses a range of functional lower back pain disorders that affect the muscles, tendons, ligaments, bones, and nerves of the back and include strain, spasm, inflammation, or impingement. Patients needing admission to the hospital or transfer to a higher level of care or skilled nursing facility will not qualify. Evaluation methods to be used in the conduct of the

project will include an assessment of health literacy within the defined patient population, comprehension scores obtained through pre- and post-test analysis, and a categorical assessment of satisfaction and general acceptance of the intervention. This will be conducted through the application during the ED visit.

Mission, Goals, and Objectives

The mission of this project is to improve patient comprehension of health information to address disparities in health literacy and improve patient satisfaction of the ED discharge process. The goal is to utilize personal technology to deliver video-based education that is easily understood and provides satisfaction to patients with varying levels of health literacy. Project objectives include increasing knowledge of the disease process, treatment plan, follow-up instructions, and reasons to return to the ED for low back pain. Additional objectives include assessing preference and satisfaction for video-based discharge instructions as compared with written discharge instructions alone.

Chapter III

Theoretical Underpinnings of Project

Change Theory

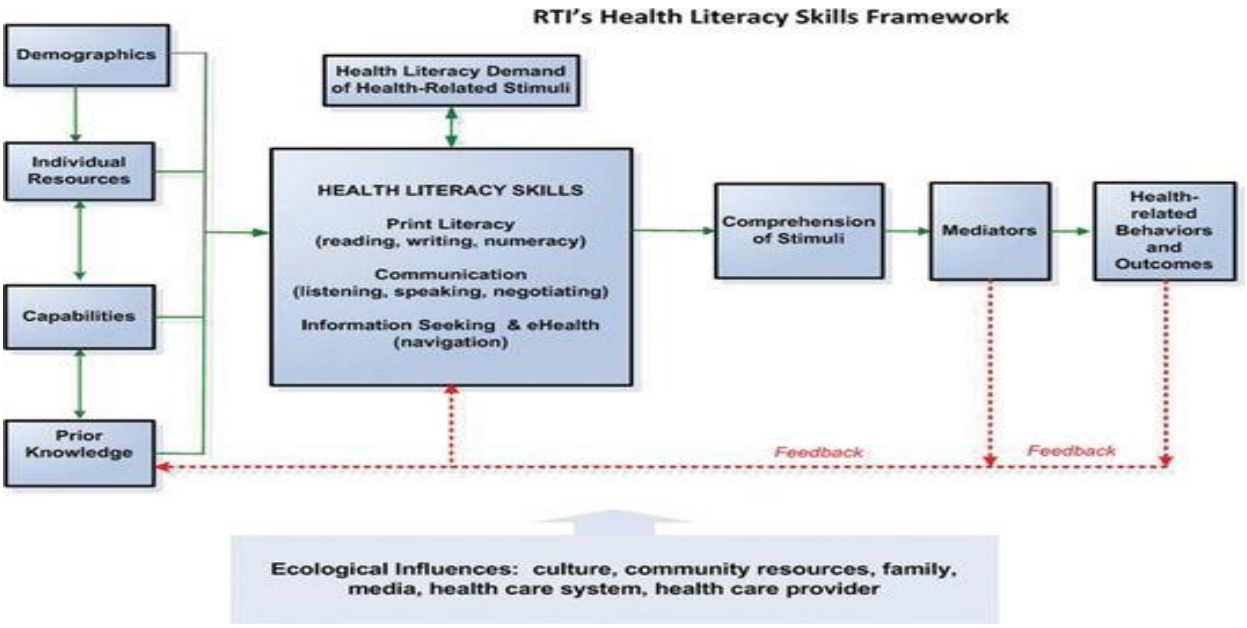
There is little information noted on how impactful targeted interventions for levels of health literacy can directly influence self-management, health beliefs, or changes in health behaviors. Health related behaviors are influenced by an individual's understanding of their health condition and their perception of how relevant these issues are to their personal circumstances. The Health Belief Model (HBM) emphasizes that sustained changes in behavior evolves from an individuals' perceptions about their susceptibility to disease, the severity of the disease, the benefits of offered interventions, and the barriers to implement changes in behavior (Champion & Skinner, 2008). Change cannot effectively occur if an individual does not have a basic understanding of information related to their disease and will not carry out recommendations for self-management if they cannot accept them. Applications to relay information in an understandable format can promote a positive change in health behaviors.

Theoretical Framework Applied to Project

Health literacy skills are essential to influence health related behaviors and outcomes. Lack of comprehension reduces the likelihood that change will occur. A patient's willingness to participate in self-care strategies is dependent upon acceptance of the intervention as is demonstrated in the HBM. Squiers et al. (2012) introduced the Health Literacy Skills Framework that encompasses the factors that are associated with health literacy skills along the continuum from the development of skills and the outcomes of health-related behaviors (Figure 1).

Figure 1

Health Literacy Skills Framework



Note.(Squiers et al., 2012).

Factors that influence the development and use of health literacy skills include (a) demographics (age, race, income, and gender); (b) individual resources of employment, education, social support, culture, literacy, and language; (c) capabilities of vision, hearing, verbal ability, memory, and cognitive functioning; and (d) prior knowledge, such as experience with disease, conceptual knowledge of health care, and familiarity with health care vocabulary. Health literacy skills develop in the dimensions of print literacy, communication, and information seeking. These skills are dynamic and as individuals interact with health-related stimuli, skills can be learned or unlearned, reinforced, or degraded. Downstream, health literacy skills affect comprehension of health information. However, comprehension alone is often not sufficient to affect health outcomes and behaviors. Other mediating factors of influence can be

internal, such as health status, attitudes, emotions, motivation, and self-efficacy; or external, such as culture, social support, community resources, the media, and access to health care resources. The context of this framework is applied to the use of a video education tool in the ED to identify the patient's developing factors of health literacy and measure health literacy skills. A video discharge intervention to supply information appropriate to lower levels of health literacy is implemented to improve comprehension.

Chapter IV

Project Plan

Setting

This project was approved by the Chief Nursing Officer (CNO) at Centennial Hills Hospital and Medical Center in Las Vegas, Nevada, for implementation in the ED. This facility is a 336-bed community hospital in Southern Nevada. It features a Level III trauma, 41-bed emergency department with 24/7 physician and APP coverage averaging 152 patient encounters per day. Post-discharge review demonstrates 30 to 60 patients per month visit this ED for back pain and are subsequently discharged from the ED.

Population of Interest

The targeted population for this project was adults 18 years and older presenting to the ED for musculoskeletal back pain. Other pathologies that can mimic musculoskeletal back pain, to include kidney stone, kidney infection, pancreatitis, gallbladder disease, abdominal aortic aneurysm, pelvic etiologies in women, or malignancy were not included. The patient had access to a personal device, such as a smartphone or tablet, and must be able to read and understand English. Patients who were admitted to the hospital or transferred to a skilled nursing facility were not included. Other exclusions included patients presenting with injuries requiring trauma activation, triaged at an emergency severity index level of 1 requiring immediate resuscitation, acute fractures, or presenting with other comorbid conditions requiring more immediate or emergent care.

Measures, Instruments, and Activities

Assessment of health literacy was performed using the three brief questions substantiated by Chew et al. (2004) to identify patients with inadequate health literacy. The questions, *"How*

often do you have someone help you read hospital materials?", *"How confident are you filling out medical forms by yourself?"*, and *"How often do you have problems learning about your medical condition because of difficulty understanding written information?"* were validated against the s-TOFHLA questionnaire which has good internal reliability, has been extensively tested, and is used as the current criterion for the development of new instruments (Collins et al., 2012). The area under the receiver of operability curve (ROC) was used to compare the overall performance of the Chew questions. The area of the curve (AUC) provides an overall summary of diagnostic accuracy. The AUC equals 0.5 when the ROC curve corresponds to random chance and 1.0 for perfect accuracy. Individual questions analyzed for applicability and usefulness given the reader's ability to answer the question, *"How confident are you filling out medical forms by yourself?"* performed the best with an AUC of 0.74 compared to the s-TOFHLA. The performance of the other two questions, *"How often do you have someone help you read hospital materials?"* [AUC 0.67] and *"How often do you have problems learning about your medical condition because of difficulty understanding written information?"* [AUC 0.66] were slightly less. The Spearman's correlation coefficient between the two tools was demonstrated to be –0.46; $p < .001$, which indicates a moderate correlation. However, the Chew questions only took two minutes to administer compared to the s-TOFHLA, which can take up to 12 minutes (Giuse et al., 2012). The time constraints of the ED and the elimination of a mediator make the Chew questions a more ideal tool in this clinical setting.

The measurement of prior knowledge and comprehension of material was performed in a pre- and post-test assessment using the Low Back Pain Knowledge Questionnaire (LBK). This is a 16-item tool that assesses general knowledge of the aspects, concepts, and treatments for low back pain. This validated tool uses recognized clinical practice guidelines to define the question

topics and answers and has been proven to be reproducible and sensitive to change by Maciel et al. (2009). To maintain brevity and keep aligned with educational content provided in the videos, only eight questions were utilized in this ED feasibility project.

The video intervention incorporated two open-access patient education videos, *Low Back Pain: Basic Information and Steps Towards Healing* (American Association of Neurological Surgeons [AANS], 2020) and *Preventing and Relieving Back Pain: Tips and Exercises to Manage Back Pain* (University of Florida Emergency Medicine Research, 2017). These videos were reviewed to contain complete information about diagnosis, expected course of illness, self-care, use of medications, time-specified follow-up, and symptoms that should prompt return to the ED.

Timeline

Project conceptualization and literature review occurred in Fall 2021. Project design and proposal defense occurred in Spring 2022 and was accepted by the faculty advisory committee. This project was submitted to the clinical site and gained approval in May 2022. Additionally, it was submitted to the UNLV Office of Research Integrity – Human Subjects in May 2022 and did not gain exemption until August 2022. This delayed the original project implementation date which was projected for the Summer of 2022. The implementation phase for this project began September 9, 2022, and was completed on December 14, 2022. A detailed timeline can be found in Appendix C.

Project Tasks and Personnel

Project planning supports the mission to implement a video education tool to improve patient comprehension of health information at all levels of health literacy and improve patient satisfaction with the ED discharge process. The student co-PI performed the tasks required to

implement this project. Implementation of this project at the clinical site was performed by the student co-PI, who was also charged with data collection activities and evaluation of survey outcomes. Personnel support through the medical and nursing staff was achieved through the education on the project. The student co-PI gave informational briefings about project implementation during group huddles and posted project information on the department communication site. Additional signage displaying reminders for patient identification and involvement were placed at triage, the nursing stations, and in the provider office. The patient information brochure was also uploaded into the electronic medical record as a patient education handout that could be printed for distribution. A detailed project task list can be found in Appendix D.

Resources and Supports

Multilevel support through the medical staff and nursing staff in the ED was requested in the form of active participation. Onboarding staff support required minimal time requirements as participation required a brief instructional intervention to explain the purpose of the project and aided in identification of qualified subjects. For the medical staff, an email was sent through a group distribution list and signs were posted by the medical provider workstations. Nursing staff were in-serviced during shift change reports and signs were posted in the triage area.

Web-based resources did not require any financial support. As this is a feasibility study, information about general acceptance was the goal with intentions to broaden resources based on response. A Google Forms application was constructed to house the intervention and was accessible free through the patient's personal device. The video interventions were obtained from free open-access patient education sites and have been viewed to contain the AHRQ key components needed for quality ED discharge (Johns Hopkins University, Armstrong Institute for

Patient Safety and Quality, 2014). As this is an exempt study, no information about the participating patient was accessed through the electronic medical record and all demographics were de-identified and not traceable to any individual patient encounter.

Risks and Threats

Consideration of risk to subjects was made based on potential physical, psychological, and safety factors. This project did not present any physical harm. However, physical limitations, such as visual or auditory impairment, or cognitive deficits, such as mental disability or dementia, may cause accessibility issues with this intervention. Psychological effects can be considered as some experts have expressed reservations about routine screening for limited literacy and point out that nearly half of patients with limited literacy are ashamed of their inability to read, and screening could potentially cause harm (Powers et al., 2010). There was no detriment to patient safety as improved communication can be protective and improve health outcomes.

Internal threats considered were through process and workflow designs. Poor development of intervention tools can produce barriers to communication and have a negative effect on project motives. ED providers and nursing staff are often rushed or distracted leaving little time to provide clarity and consistency for education. Poor communication during transitions of care can lead to miscommunication. Nonparticipation of provider staff to include the intervention during discharge or failure to prompt the patient to view the intervention can generate missed educational opportunities. Participation of nursing staff in the intervention can affect bed turnover and lengthen disposition times leading to decreased patient satisfaction. Finally, an overburdened, post-pandemic medical provider and nursing staff may resist change

and proffer difficulty with buy-in for a cultural shift towards education improvement initiatives that deviate from usual workflow patterns.

External threats can be assessed by failures of patient access to the intervention or administrative barriers that affect resource utilization. Patients may have difficulties using personal devices to access the QR codes due to device failure or lack of understanding of how device works. Alternatively, they may be unwilling to use personal devices due to information security concerns or fear of malware. Preconceived health beliefs influenced by non-credible sources, such as web-searches and social media, can distort a well-intentioned education intervention that may contradict current perceptions of health. The use of nursing resources to direct patients to utilize the intervention may be limited by administrative desire to allocate nursing resources elsewhere.

Institutional Review Board Approval (IRB)

Application for approval was sent through the UNLV Office of Research Integrity – Human Subjects in May 2022. The website can be accessed at https://www.unlv.edu/nursing/research-support. Notification was given on August 2, 2022 that the research protocol was reviewed as indicated in Federal regulatory statutes 45 CFR 46 and deemed it exempt under Exempt Category 2(i), see Appendix G. This exemption allows that only interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) can be included. The information obtained was recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

Evaluation Plan

Within the construct of Squires et al. (2012) Health Literacy Skills Framework, certain key concepts that influence the development and use of health literacy skills were assessed through questions for de-identified demographics, prior experience, health beliefs, and prior knowledge of back pain. Health literacy skills were tested with the identification of inadequate health literacy skills using three brief questions validated to identify individuals with inadequate health literacy (Chew et al., 2008). Comprehension of low back pain knowledge was assessed using pre- and post-test analysis of the material. Post-test analysis occurred after the viewing of the videos during the same intervention. Patient preference and satisfaction with the intervention was measured by the rating of responses to a series of questions and were then analyzed against stratified health literacy groups.

Chapter V

Summary of Implementation and Results

Precis of the Phenomenon of Interest and the Problem and Purpose of the Project

In this DNP project, the phenomenon of interest is related to an individual's health literacy and how it affects how they comprehend their disease process and interact within a healthcare environment. The purpose of this project was to engineer an intervention that explored the feasibility of the use of personal technology to deliver video-based education to adult patients with differing levels of health literacy in a community ED to improve comprehension of material and assess satisfaction with the discharge method. The use of personal devices has become integral to the dissemination of information and utilizing this technology was employed to improve access to health information in the ED environment.

Evidence supports the use of video-based education as a modality to improve comprehension and satisfaction with the delivery of health information in individuals who have inadequate health literacy skills. The goal was to bridge the gap in literature to explore solutions for providing complete, quality education in video format within a busy ED environment in such a way that is accepted and understandable.

Threats and Barriers to the Project

There were several identified threats and barriers to this project. The implementation phase of this project occurred during Fall of 2022 during a period termed as the "Tripledemic" of Covid-19, respiratory syncytial virus (RSV), and influenza where EDs were overwhelmed with surges in patient volume during already dire post-pandemic nursing staff shortages. This led to a bias of convenience and a small sample size due to the participation of only a small subset of nurses and providers who assiduously helped with recruitment during their scheduled shift times.

Because there was no predictability to patient presentation, subjects of inclusion coming to the ED at times of low staff engagement created many missed opportunities for recruitment. In addition, the research exemption did not allow for the accessing of personal information through electronic medical records to identify or attempt recovery of those lost to inclusion.

Overall wellness and environment factored in as threats to participation. The targeted diagnosis identified individuals with complaints of acute back pain. Physical discomfort can be a barrier to a patient's willingness to participate in an educational intervention and can also interfere with how one interacts with the intervention by not fully completing or comprehending questions that are asked. Patient surges also led to extended lobby wait times which did not offer an ideal environment to view and comprehend videos. Recruitment for the project was also limited due to the lack of dedicated space for provider to patient communication.

Although the use of personal technology has been found to have a universal increase in becoming a preferred method for accessing health information (Levin-Zamir & Bertschi, 2018), health information seeking behaviors from internet sources was also suspected to be a barrier. Recruitment monitoring prompted further research to discover barriers to accessing the internet-based tool. One study found that individuals who were younger, had higher socioeconomic status, higher education levels, and higher internet skills were more likely to seek health information using the internet (Jacobs et al., 2017). This disparity becomes important to address when designing strategies to improve communication with individuals at risk for inadequate health literacy as these individuals tend to be older, have less education, and are of a lower socioeconomic status.

Finally, time constraints for project completion were also determined to be a barrier. The implementation and data collection phase of the project was initially scheduled to begin in June

2022 during Summer term to allow for maximum recruitment, however delays in IRB review pushed the project start date to September 2022. This allowed only three months for recruitment and data collection activities, which coincidentally aligned with the start of the "Tripledemic" as mentioned above.

Monitoring of the Project

Monitoring of the project was performed through direct observation, communication with provider and nursing staff, and data collection activities. When on shift, the student-PI would monitor patients presenting that met inclusion criteria and directly interact to elicit recruitment by presenting the project and providing the informational brochure. Because the ED is a 24/7 operation, continuous monitoring by the student-PI was not possible. Regular interfaces with nursing and provider staff through staff huddles and communication websites were performed to remind people to identify subjects meeting criteria and hand out the informational brochure during the entire implementation phase. Signage was also placed in key areas to prompt staff engagement. Data collection activities included monitoring the Google Forms application for patient participation and responses. As the implementation phase progressed, low recruitment numbers were identified and additional strategies of allowing self-selection with the availability of information in the ED lobby, uploading of the informational brochure into the electronic medical record as a patient education handout, and engaging staff at the freestanding ED affiliated with Centennial Hills Hospital to participate.

Data Collection

An education tool specifically designed to be accessed on a personal device (smartphone or tablet) was used to deliver educational videos as an intervention to augment written discharge education, see Appendix B. This tool was created through Google Forms, a survey

administration software application that is included as part of the free, web-based Google Docs Editors Suite. This platform was chosen because it allowed data collection and embedding of the videos in an easy-to-use format. Also, most people are familiar with Google and brand familiarity with Google products was thought to promote trust when accessing applications on a personal device. Patients presenting to the ED with a complaint of back pain received information about the study and were asked to participate by the student co-PI, nursing staff, or medical staff by offering a verbal explanation and informational brochure about the project. To improve recruitment numbers and mitigate convenience sampling, additional signage and information was placed in the ED lobby for patients presenting with back pain to self-select. Agreement to participate occurred when accessing the application via QR code on a personal device. To proceed to the survey and education material, a review of the consent form had to be performed and agreed to prior to exposure to the content, see Appendix F. Contact information for the PI and student-PI was provided for any questions or concerns prior to consent. Once the participant agreed to the terms of consent, they were able to access the application. Data collection, as outlined in Appendix B, consisted of demographics, pre-existing health beliefs and experiences, a health literacy measurement, pre-and post-test comprehension scores of education material, and a general survey of preference and satisfaction with video-based education methods.

Data Analysis

The purpose of this DNP project was to determine the feasibility of implementing a video-based education tool that could improve comprehension of material and satisfaction with delivery for patients presenting to the ED with undifferentiated levels of health literacy. The results are presented within the realms of general demographics, health literacy assessment,

comprehension of education material, and the satisfaction and preference of material and delivery.

Recruitment of subjects began September 9, 2022, and extended through December 14, 2022. During this timeframe, the average daily volume for this ED was 152 patients. Using historical data, 30 to 60 individuals meeting inclusion/exclusion criteria present to the ED monthly (0.7 to 1.3 percent of the total ED population). Over the three-month implementation phase, 14 individuals consented to participate in this study, capturing 7.8 to 15 percent of the estimated eligible population (0.1 percent total ED population within the given timeframe). Due to the research exemption, chart review for subject eligibility was unable to be performed to provide a more accurate assessment of the sample.

Participant Demographics

Demographic characteristics were performed using de-identified indicators of age, gender, education level, and English as primary language as social determinants of health literacy (Table 1). The highest represented age group was 18- to 40-years old (50%, n=7) and was closely followed by the 41- to 60-year-old age group (42.9%, n=6). Only one individual stated an age over 60 years old and there were no individuals under the age of 18, which would have made them ineligible to complete the study. Males made up 57.1% (n=8) and females represented 42.9% (n=6) of respondents. Most had some college education or higher (71.4%, n=10) and identified English as their primary language (92.9%, n=13).

Table 1

Demographics of Study Participants (N = 14)

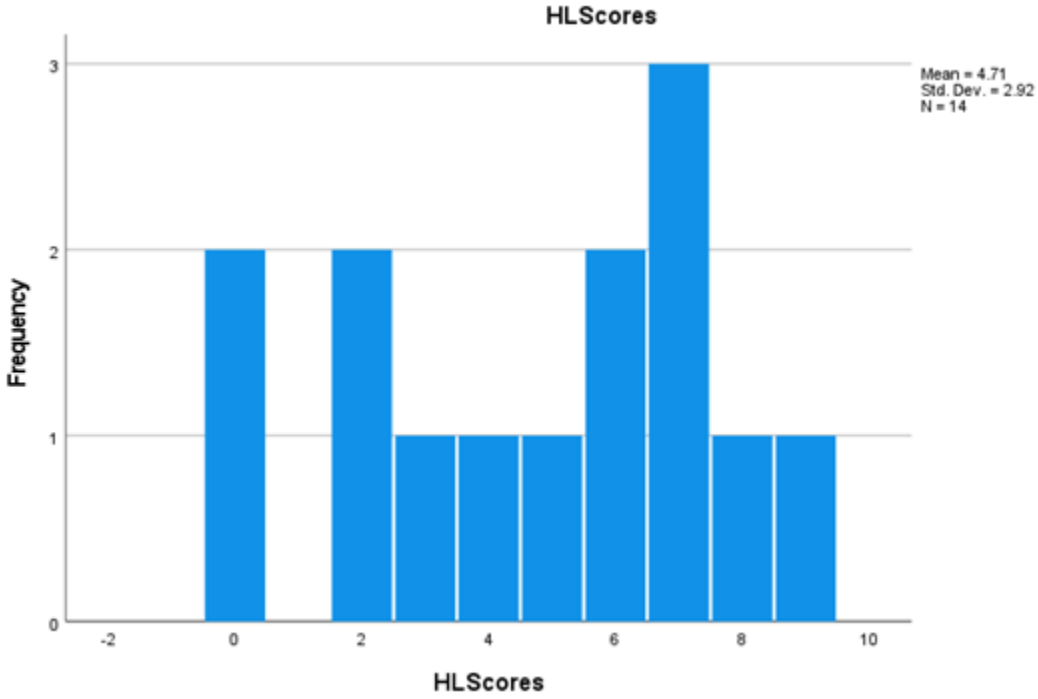
Demographic	Frequency	Percentage (%)
Age (years)		
18-40	7	50.0
41-60	6	42.9
Over 60	1	1.0
Gender		
Male	8	57.1
Female	6	42.9
Education level		
High School Graduate	4	28.6
Some College	6	42.9
College or Higher	4	28.6
English primary language		
YES	13	92.9
NO	1	7.1

Health Literacy Assessment

The determination of level of health literacy was achieved by using the three brief questions substantiated by Chew et al. (2008) to identify patients with inadequate health literacy. The advantage of this instrument is that these questions can be employed rapidly and unobtrusively in busy clinical settings and was an ideal tool to provide an overall assessment of the health literacy skills of the project population. Higher scores have a higher probability of detecting inadequate health literacy skills. The mean score of this population was 4.7 [range 0-9] with other central tendency measures of median [5.5] and mode [7] creating a negative skew of data.

Figure 2

Individual Scores of Health Literacy (HL), by Question



Notes: Scoring:
"Help read": Never (0), Occasionally (1), Sometimes (2), Often (3), Always (4)
"Confidence": Extremely (0), Quite a bit (1), Somewhat (2), A little bit (3), Not at all (4)
"Problems learning": Never (0), Occasionally (1), Sometimes (2), Often (3), Always (4)

According to Chew et al. (2008), there is no established threshold to represent inadequate health literacy, however answers of "Sometimes" or "Somewhat" have been shown to have a higher posttest probability in most populations for identifying individuals with a higher likelihood to possess inadequate skills. Table 2 depicts the breakdown of scores within this study's population.

Table 2

*Individual Responses to HL Questionnaire**

Individual	Help read[a]	Confidence[b]	Problems learning[c]	Total Score
1	Never (0)	Not at all (4)	Always (4)	8
2	Sometimes (2)	Somewhat (2)	Sometimes (2)	6
3	Occasionally (1)	Quite a bit (1)	Never (0)	2
4	Never (0)	Somewhat (2)	Sometimes (2)	4
5	Occasionally (1)	Quite a bit (1)	Occasionally (1)	3
6	Sometimes (2)	A little bit (3)	Sometimes (2)	7
7	Often (3)	Quite a bit (1)	Occasionally (1)	5
8	Sometimes (2)	Somewhat (2)	Sometimes (2)	6
9	Never (0)	Not at all (4)	Often (3)	7
10	Never (0)	Extremely (0)	Never (0)	0
11	Never (0)	Extremely (0)	Never (0)	0
12	Sometimes (2)	Not at all (4)	Often (3)	9
13	Never (0)	Somewhat (2)	Never (0)	2
14	Occasionally (1)	Not at all (4)	Sometimes (2)	7

Note. *Taken from the publication, *"Brief Questions to Identify Patients with Inadequate Health Literacy"(*Chew et al., 2008).
[a]Help Read: *"How often do you have someone help you read hospital materials?"*
[b]Confidence: *"How confident are you filling out medical forms by yourself?"*
[c]Problems learning: *"How often do you have problems learning about your medical condition because of difficulty understanding written information?"*

Comprehension of Material

Comprehension of material was determined by using pre- and posttest scores based upon low back pain knowledge. The intervention was two short videos presenting information about back pain that included information defined to be key indicators of high-quality ED discharge information. The questions used from the Low Back Pain Questionnaire focused on practice guidelines used for acute presentations of low back pain which would be relevant to the emergency setting. Out of the eight questions used, there were 13 possible correct answers. Every question was given the option to answer "I don't know" to prevent guessing but was still scored as a 0. Fourteen individuals completed the pretest, however only six individuals

completed the posttest. Figure 3 shows paired samples t-test analysis of pre-and posttest scores for the completed tests (n=6) using IBM SPSS Statistics (Version 28). This analysis shows there was no statistical difference amongst pre- and posttest scores (p=0.076) using a two-tailed test to assess for change without regard to health literacy level.

Figure 3

t-test Results Comparing Pre-and Posttest Knowledge Scores, All Individuals [n=6]

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			One-Sided p	Two-Sided p
Pair 1	PreTest score - PostTest score	-3.833	4.215	1.721	-8.257	.590	-2.228	5	.038	.076

Although there is no set threshold to determine health literacy based upon collected data, there is a higher probability for inadequate health literacy amongst individuals that score higher on the Chew et al. (2008) questions for health literacy. To dichotomize individuals with suspected inadequate versus adequate health literacy, a score greater than three was used to identify those at-risk individuals. Pre- and posttest analysis again failed to find any significance in change amongst individuals identified as potentially inadequate (p=0.210) and adequate (p=0.395) health literacy stratification as depicted in Figures 4 and 5.

Figure 4

t-test Results Comparing Pre-and Posttest Knowledge Scores, Inadequate HL [n=4]*

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			One-Sided p	Two-Sided p
Pair 1	PreTest score - PostTest score	-4.000	5.033	2.517	-12.009	4.009	-1.589	3	.105	.210

Note: *HL score >3 based on HL Questionnaire responses (Chew et al., 2008)

Figure 5

t-test Results Comparing Pre-and Posttest Knowledge Scores, Adequate HL [n=2]*

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			One-Sided p	Two-Sided p
Pair 1	PreTest score - PostTest score	-3.500	3.536	2.500	-35.266	28.266	-1.400	1	.197	.395

Note: *HL score ≤ 3 based on HL Questionnaire responses (Chew et al., 2008)

Satisfaction and Preference

The second factor in this feasibility study was to determine if video-based education was a preferred method for receiving health information and if it could improve satisfaction with the ED visit. Figure 6 demonstrates the outcome with all respondents completing the survey (n=14). The questions asked include learning preference, understanding of content, preference for videos, and overall improvement of ED experience. A Likert scale was used to determine individual response in the realms of 'Strongly Agree,' 'Agree,' 'Somewhat Agree,' and 'Do not Agree.'

The first question was based on the learning preference of the individual and stated, *"I understand health information better by watching videos than by reading about it."* Most respondents chose 'Strongly Agree' (57.1%) and no respondents disagreed with this statement

relaying that all respondents at least 'Somewhat Agree' that learning health information may be achieved by watching videos versus reading information. The next question, *"This video improved my understanding of back pain,"* spoke to the content of the videos and whether the information given helped improve individual learning of which 42.9% chose 'Strongly Agree' and the remaining 57.2% were split between 'Agree' and 'Somewhat Agree.' None of the respondents disagreed with this statement. The statement, *"I understand what to do next,"* was an important element of the quality indicators for ED discharge as self-management is a key component of treating and preventing recurrence of low back pain. None of the respondents disagreed, indicating that all the individuals at least somewhat agreed with this statement based on their selected response.

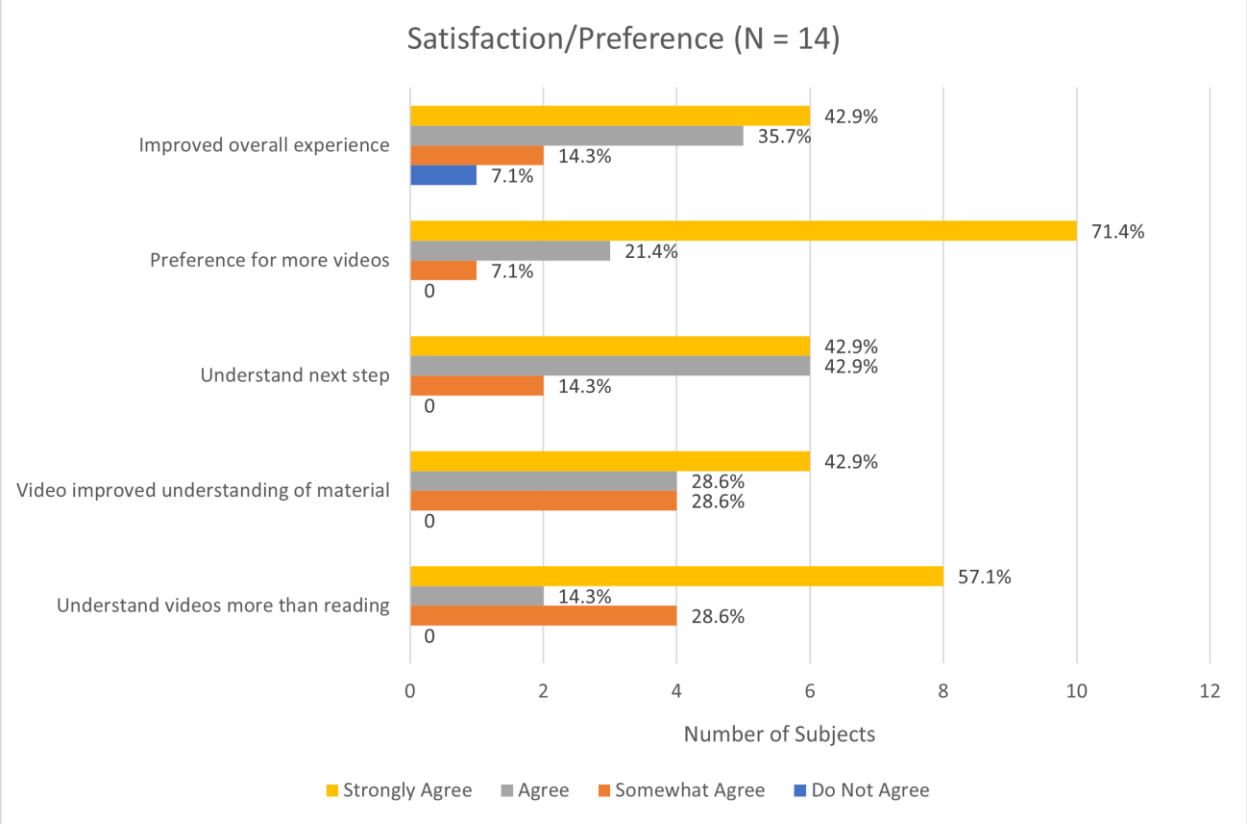
Preference for this intervention was determined by the two statements, *"I would like to see more educational videos when I go to the emergency department,"* and, *"If I need more information about back pain, I prefer (a) watching videos about back pain, (b) reading information about back pain, (c) both, or (d) neither."* Over seventy percent of respondents strongly agreed that they would like to see more educational videos in the ED. None of the respondents disagreed. Overall preferences for additional information were to watch more videos about back pain (57.1%), while the remaining respondents chose to seek additional back pain information through both videos and reading (42.9%).

Satisfaction and the patient experience are important considerations when implementing interventions in the ED. The statement, *"This video improved the experience of my visit to the emergency department,"* demonstrated 42.9 percent of individuals 'Strongly Agree,' 35.7 percent 'Agree,' 14.3 percent 'Somewhat Agree,' and one individual (7.1%) did not agree.

Overall agreement may indicate that methods of communication and the delivery of health information can improve patient satisfaction in the ED.

Figure 6

Survey Results for Satisfaction/Preference of Intervention



Giving Meaning to the Project

Discussion of the Results of the Project

The research questions of this project addressed the feasibility of incorporating video-based education into a community ED with the aim to improve comprehension of material and to assess patient preference and satisfaction with the method. This project focused on the feasibility

of the intervention because this type of study assesses the practicality of the intervention. It aims to uncover the strengths and weaknesses of the proposed intervention in the environment it is to be used. This feasibility project was conducted in a busy ED among patients with undifferentiated skills of health literacy.

When reviewing the validity of the project results, this project was found to be grossly underpowered with a post-ad hoc power of 0.438 computed using alpha=0.05. This would indicate that there was not sufficient evidence to make a specific claim, likely resulting in a Type II error. Comprehension determined by pre- and posttests did not demonstrate any statistical difference in scores using a paired t-test amongst individuals who completed both tests (n=6). Scores dichotomized into potential inadequate and adequate health literacy also failed to show any statistical significance for change. Further analysis with an adequately powered study would be needed to determine the effectiveness of this intervention.

Survey results were subjective and informative within the realms of individual preference and satisfaction. Overall, the use of video-based information was well-received amongst respondents within this population preferring video-based interventions and their applicability to learning preference and understanding of material. Overall preference was reported to be information presented in video form or video augmenting written information. Overall satisfaction with the ED visit was at least somewhat enhanced amongst all respondents, except for one individual reporting their disagreement with overall ED experience improvement.

Degree to Which the Problem Addressed the Problem Identified

This project aimed to address the problem of health information delivery within the ED environment. It has been found that the content of health information at time of discharge is often incomplete which can lead to poor self-management and return to the ED causing increased

morbidity and healthcare costs for low acuity issues. Video-based interventions have been found to improve comprehension of health information and were often preferred as a delivery method. The results of this project could not demonstrate improvement in comprehension of material due to being grossly underpowered. There was no significant difference found between pre- and posttest results used to demonstrate comprehension using paired t-test analysis, however these could be falsely negative due to Type II error from an underpowered study. In other words, the endpoint of evaluating comprehension related to the intervention was inconclusive.

Survey results for preference and satisfaction, on the other hand, support this video-based intervention as preferred and a factor of increased satisfaction with the ED visit, with the exception of one individual. Further discovery within this realm would be needed to identify this method as adding value to the ED visit.

Project Results and Relationship to Theory and Evidence

The synthesis of the literature review found that video-based methods of education can augment verbal and written instructions in the improvement of comprehension and recall of health information in lower health literacy groups. As this study's results did not demonstrate any statistical difference in comprehension, it is uncertain whether this intervention supports the results of these studies. However, it was found that video-based interventions have been generally well-received by the project's subjects and shows promise of improving satisfaction with ED discharge. The survey results for this project support the idea that patients within this study would like to see more video-based interventions in the future and videos improved their learning.

Preference is a key determinant to driving behavioral change. The Health Belief Model (HBM) emphasizes that sustained changes in behavior evolves from an individuals' perceptions

about their susceptibility to disease, the severity of the disease, the benefits of offered interventions, and the barriers to implement changes in behavior. The results of this study are an important contribution towards future studies that wish to explore how preferences can affect attitudes and behaviors towards self-management.

Improvement of Patient Outcomes

This project was applied to the Health Literacy Skills Framework introduced by Squiers et al. (2012). This framework depicts how health literacy skills develop in the dimensions of print literacy, communication, and information seeking using the inputs of demographics, individual resources, capabilities, and prior knowledge. Health literacy skills affect comprehension of health information. However, comprehension alone is often not sufficient to affect health outcomes and behaviors. Internal factors such as attitudes and motivation help drive health related behaviors. Again, the demonstration of communication preferences for the delivery of health information can augment skills that affect overall health outcomes.

It is unclear whether the diagnosis of musculoskeletal back pain affected results or participation in this study. There remains a paucity of information regarding the impact of health literacy on back pain. However, it has been noted that lower levels of health literacy result in less information seeking, increased pain perception, and decreased self-management (Edward et al., 2018; See et al., 2021). This study focused on comprehension of health information and preference for delivery methods. As preference can be a key determinant in the attitudes and acceptance of health information, this study provided an important contribution towards the preference of health information delivery to this particular ED population.

Contributions to Nursing Practice

Health literacy initiatives offer innovative solutions to minimize the gap between patient skills and abilities and the acceptance and utilization of health information. A universal assessment of health literacy should be an essential component of every patient encounter to enhance the provision of person-centered care, patient safety, and overall patient, population, and system outcomes. The nursing community is well positioned to adopt health literate strategies to engage patients and improve how they interact with the health care environment.

The results of this study have identified video-based education as an accepted tool to deliver health information in the ED setting. The use of informational videos can optimize opportunities to engage patients in a chaotic environment where the limitations of time and protected in-person communication create barriers to understanding health information. This information provides a platform to implement more actionable interventions to increase nursing knowledge, attitudes, behaviors, practice resources, and system capabilities to lessen the health literacy-related burden on patients and costs for health care.

Potential for Sustainability and Future Scholarly Activity Resulting from this Project

Addressing health literacy is a national priority. Healthy People 2030, which establishes national objectives for health improvement, focuses on improving health communication so that people can easily understand and act on health information. Making health information easy to understand and use is key to improving health and well-being. Initiatives to improve the delivery of healthcare information has become an important objective and every organization involved in health information and services needs to develop initiatives to improve how health information is delivered. The Department of Health and Human Services has developed The National Action Plan to Improve Health Literacy seeking to engage organizations, professionals, policymakers, communities, individuals, and families in a linked, multi-sector effort to improve health literacy

(HHS, 2010). This plan directly addresses the need to increase basic research and the development, implementation, and evaluation of practices and interventions to improve health literacy.

Reimbursement dependent on patient satisfaction scores has prioritized quality improvement initiatives that improve patient experience. Patient understanding of information and communication with providers are important realms in the assessment of quality care. The sustainability of video-based education can be supported by the creation of an interdisciplinary working group to optimize the content and expansion of a video library. Methods of delivery and microlearning strategies can target common diagnostic groups and promote better utilization of the ED.

This DNP project was conducted to translate an evidence-based intervention for the delivery of healthcare information into a practice setting within the ED in a way that is understandable and preferred by the ED population and to contribute to the knowledge base of health literacy initiatives in the ED. Finding effective methods for health information delivery is important and there has been rapid growth in the use of technology and internet-based resources in health care which may be explored. There is a paucity of current literature addressing how these tools can form effective interventions to improve education delivery to individuals with inadequate health literacy. The sustainability of this project would be dependent on whether the information provided promoted better health outcomes. At this time, it is unknown if this project improved the health outcomes of respondents; however, as study results have demonstrated preference for video education and an improvement in overall satisfaction for the ED visit it has created an opportunity to conduct more research on this topic and other health literacy initiatives.

Plan for Dissemination of Results

This study will be submitted to the UNLV Graduate College and uploaded to ProQuest. Findings will be reported to organizational leaders within the health system through further conference with nursing leadership and the directors of quality, patient safety, and patient experience to trigger additional support for further research into health literacy interventions in the ED.

Appendix A

Supplementary Literature Tables

Table A1

CINAHL Database Search Strategy

CINAHL Subject Heading	Keyword Synonyms	Articles Retrieved
1 Back Pain		
	Back Pain OR Musculoskeletal Pain OR Mechanical Pain	
2 Emergency Service		
	Emergency Service OR Emergency Department OR Emergency Room OR Emergency Medicine	
3 Patient Education		
	Patient Education OR Discharge Education OR Health Information	
4 Health Literacy		
	Health Beliefs OR Comprehension OR Understanding OR	
5 Intervention		
	Technology OR Video Instruction OR Video Discharge	

#1 and #2	#1, #2, and #3	#1 and #3	#3 and #4	#3, #4, and #5
209	1	75	117	5

Note. Data retrieved November 7, 2021, from the Cumulative Index to Nursing and Allied Health Literature (CINAHL) database. Boolean/phrase search mode was used with expander to apply all equivalent subjects. Search limits were placed to filter results for peer reviewed articles, human, English language, and all adults.

Table A2

Cochrane Database Search Strategy

Title Abstract Keyword	Keyword Synonyms	Cochrane Reviews
1 Back Pain		
	Back Pain OR Musculoskeletal Pain OR Mechanical Pain	
2 Emergency Service, Hospital		
	Emergency Department OR Emergency Room OR Emergency Medicine	
3 Intervention		
	Technology OR Video Instruction OR Video Discharge	
4 Health Literacy		
	Health Information OR Patient Education OR Health Beliefs	

#1 and #2	#1, #2, and #3	#3 and #4	#2, #3, and #4
51	12	41	13

Note. Data retrieved November 7, 2021, from the Cochrane Library. Title Abstract Keyword search was conducted using MeSH descriptor.

Table A3

PubMed Database Search Strategy

MeSH Term	Keyword Synonyms	Articles Retrieved
1 Back Pain		
	Back Pain OR Musculoskeletal Pain OR Mechanical Pain	
2 Emergency Service		
	Emergency Service OR Emergency Department OR Emergency Room OR Emergency Medicine	
3 Patient Education		
	Patient Education OR Discharge Education OR Health Information	
4 Health Literacy		
	Health Beliefs OR Comprehension OR Understanding	
5 Intervention		
	Technology OR Video Instruction OR Video Discharge	

#1 and #2	#1 and #3	#1, #3, and #4	#3 and #5	#1 and #5	#4 and #5
52	296	1	160	54	10

Note. Data retrieved November 7, 2021, from PubMed database. Search conducted using MeSH descriptor. Articles searched using filter to include only meta-analyses, systematic reviews, and randomized controlled trials. Search limits were adjusted to English language and adults +19.

Table A4

Education Resources Information Center (ERIC) Database Search Strategy

Keyword	Keyword Synonyms	Articles Retrieved
1 Health Literacy		
2 Health Education	Health Information OR Patient Education OR Health Knowledge OR Health Understanding	
3 Technology	Video Instruction OR Video Discharge	
4 Intervention	Treatment OR Education	

#1 and #2	#1, #2, and #3	#1, #2, and #4	#1, #3, and #4
134	10	125	35

Note. Data retrieved November 7,2021, from the ERIC database. Boolean/phrase search mode for keywords was used with expander to apply all equivalent subjects and apply related words. Results were filtered to search peer-reviewed journals and English language.

Figure A1

Evidence Table

Citation	Research Design	Sampling /Setting	Data Analysis	Findings /Results	Level of Evidence	Comments
Giuse, N. B., Koonce, T. Y., Storrow, A. B., Kusnoor, S. V., & Ye, F. (2012). *Using Health Literacy and Learning Style Preferences to Optimize the Delivery of Health Information*. *17*, 122–140.	2 sequential RCTs; 2 separate cohorts Information tailored to HL level alone (exp #1) or in combination w/preferred learning style (exp #2) compared to routine d/c Measurement: pre- and post-test knowledge in ED and 2 wk f/u via telephone	Exp 1 (N=85) control grp received routine d/c ins; int grp received d/c ins tailored to HL level Exp 2 (N=87) Int grp d/c ins tailored to both HL level and learning style University ED in Southern US *Inclusion*: ≥18 yrs, w/BP ≥140/90 x 2 in ED *Exclusion*: cognitive impairment, psychiatric CC, or ESI 1	Pre- and post-test results using paired t-tests; sample size of 74, provided 95% power to detect difference, two-sided α=0.05 Multivariate linear regression of VARs contribution to test score; EXP 1 VAR: HL level score, BP hx. EXP 2 VAR: gender, race, pain, educ level, income.	HL level: (N=196), 83.7% adequate, 8.7% marginal, 7.7% inadequate. Control grp: no stat diff in pre- post-test scores in either Exp. Int grp: stat sig gains in both Exp 1: 2% to 45% and Exp 2: 4% to 60 %. Interventions tailored to HL and learning preferences both had stat sig improvements in patient understanding.	Level II	HL level test using S-TOFHLA Learning style tool VARK Questionnaire (Visual, Aural, Read/Write, Kinesthetic) Standard d/c is written ins Assesses knowledge of HTN using pre- post-test
McCarthy, D. M., Waite, K. R., Curtis, L. M., Engel, K. G., Baker, D. W., Wolf, M. S., McCarthy, D.	Cohort study featuring hypothetical video scenarios and participants ability	N=755 Academic internal medicine clinic and	% Correct on individual item across 3 HL groups using Pearson x^2	HL: 11.8% low, 16.6% marginal Those w/low and marginal HL have	Level III	Limitations: Older population, intentionally did not give written

M., Waite, K. R., Curtis, L. M., Engel, K. G., Baker, D. W., & Wolf, M. S. (2012). *What did the doctor say? Health literacy and recall of medical instructions*. *50*(4), 277–282.	to recall and retain information immediately and then again in 15 minutes. HL assess using TOFHLA (long form) Outcome: ability to recall and retain spoken information during medical encounter	3 federally qualified health centers Midwest US *Inclusion:* 55-74 y/o, primary phys w/study, English *Exclusion*: cognitive impairment, vision/hearing problems.	mean diff in total scores across 3 HL groups using one way ANOVA Multilinear regression to assess individual items (age, gender, race, level of educ, and prior exposure) to performance	poorer ability to recall spoken instruction immediately and at 15 minutes vs adequate HL		instructions, video was non-interactive Adequate HL also had poor performance on several factors Leads to interventions for alternate teaching strategy Hypothetical case scenarios: wound care instructions and new dx of GERD
Atzema, C. L., Austin, P. C., Wu, L., Brzozowski, M., Feldman, M. J., McDonnell, M., & Mazurik, L. (2013). *Speak fast, use jargon, and don't repeat yourself: a randomized trial assessing the effectiveness of online videos to supplement emergency department discharge instructions*. *8*(11), e77057.	Prospective, single-center RCT Usual care vs online video with 3-day telephone f/u to assess knowledge of both groups 3 question f/u test for info recall of d/c inst via telephone Primary outcome measured: pt's score (out of 3) on d/c inst	N =133 Adult tertiary care hospital level 1 trauma center in Canada *Inclusion:* pt of any age (or caregiver) discharged from ED w/1 of 38 common dx, English; *Exclusion*: no access to internet or telephone	Two-sample t-test comparing mean score b/w both treatment groups Logistic regression adjusted for co-variants of age, sex, English first language, and ESI level. 63 pts per study arm were required for 80% Power (intervention grp n=58; control grp n=75), $\alpha \leq 0.05$	Intervention grp had higher mean scores (2.5, s.d. 0.8) compared to control group (2.1, s.d. 0.7) p=0.002	Level II	Does not evaluate pt HL level Study suggests utilizing technology to deliver info for common d/c dx can offset communication deficiencies r/t lack of time to achieve understanding and retention

Bloch, S. A., & Bloch, A. J. (2013). *Using Video Discharge Instructions as an Adjunct to Standard Written Instructions Improved Caregivers' Understanding of Their Child's Emergency Department Visit, Plan, and Follow-Up: A Randomized Controlled Trial*. *29*(6), 699–704.	RCT Standard written discharge compared to video d/c inst Knowledge with 5-question, 20-point questionnaire at ED d/c and telephone f/u 2-5 days post discharge for comprehension and recall	N = 436 control (n=220); intervention {n=216) Academic pediatric ED *Inclusion:* caregivers of pts 28 days to 18 yrs, dx of fever, vomiting or diarrhea, and wheezing or asthma; *Exclusion:* non-English speaking, critical pts, or admitted to the hospital.	Unpaired t-test for scores from written vs video d/c inst for each diagnosis 95% Confidence interval	Statistical significance found with interval grp score in ED (12.2 vs 8.9) and post discharge score (11.1 vs 7.8) overall Individual dx showed sig in fever ($p<0.0001$) and diarrhea ($p<0.0001$) grp, however asthma grp showed no stat sig diff pre-post-test ($p=0.2$ and $p=0.07$)	Level II	Does not evaluate HL level Diff in asthma grp may be explained by chronic conditions likely have better baseline knowledge as information is not new
Goodman, K., Mossad, S. B., Taksler, G. B., Emery, J., Schramm, S., & Rothberg, M. B. (2015). *Impact of Video Education on Influenza Vaccination in Pregnancy*. *60*(11–12), 471–479.	RCT Pre-visit vaccination video education to identify influence on health beliefs and vaccination rates compared to control group without video intervention	N=105 3 OB/GYN clinics in suburban US city *Inclusion:* pregnant pts w/o document flu vaccination with schedule routine visit; *Exclusion:* employees of clinic, cared for by co-investigator, allergy to eggs or vaccine, high risk pregnancy, non-English speaking	t-test for pre- pot-test scores and chi square to compare categorical characteristics logistic regression to model association b/w vaccination and health beliefs in each grp. Stat sig was established at two-sided $p<0.05$ Sample size powered at 80% to	Video intervention positive influence on health beliefs by test question; flu shot may harm mother (diff -0.05, $p=0.009$) or baby (diff -0.44, $p=0.015$), flu shot may protect mother (diff 0.49, $p=0.003$) or baby (diff 0.59, $p=0.001$) No stat diff in vaccination rates ($p=0.70$)	Level II	Health beliefs have been predictive of vaccination (health behavior) and might translate into behavior change.

			detect effect size of 0.55			
Griffey, R. T., Shin, N., Jones, S., Aginam, N., Gross, M., Kinsella, Y., Williams, J. A., Carpenter, C. R., Goodman, M., & Kaphingst, K. A. (2015). *The impact of teach-back on comprehension of discharge instructions and satisfaction among emergency patients with limited health literacy: A randomized, controlled study*. *8*(1), 10–21.	RCT Adults screened as low HL were randomized to teach-back or standard d/c inst Structured interviews post-discharge assessing comprehension and perceived comprehension of ED dx, ED care, post-ED care, and return instructions	N=254 Urban ED, Midwest USA *Inclusion:* ≥18 yrs, d/c from ED, screened HL score ≤6; *Exclusion:* Aphasia, non-English speaking, mental handicap, psychiatric CC, high acuity, insurmountable communication barrier, eval for sexual assault, and intoxication.	Sample adequate for 80% power and α=0.05 Demographics analyzed using chi-square and group associated compared w/outcomes using Mantel-Hanzel chi-square Multivariable ordinal logistic regression models to examine the effects of study group on each outcome variable	Intervention grp had higher comprehension for post-ED medication (p<0.02), self-care (p<0.03), and f/u inst (P<0.0001), no change in satisfaction or perceived comprehension	Level II	Discharge from the ED to home is an important high-risk transition of care HL evaluated using REALM-R
Ismail, S., McIntosh, M., Kalynych, C., Joseph, M., Wylie, T., Butterfield, R., Smotherman, C., Kraemer, D. F., & Osian, S. R. (2016). *Impact of Video Discharge Instructions for Pediatric Fever and Closed Head Injury from the Emergency Department*. *50*(3), e177–e183.	RCT Standard written and verbal d/c inst compared to video d/c Post-test after inst given and 2 wk f/u to determine return to ED.	N = 63 <HS educ (n=11) ≥HS educ (n=52) Urban, academic pediatric ED *Inclusion:* Caregivers ≥18 yrs with dx; *Exclusion:* non-English, suspected child abuse, admitted, or ESI level 1	Fisher's exact tests for categorical variables Spearman correlations assess associations b/w test scores and continuous variables Sig P value <0.05	Post-test scores showed stat sig for intervention grp for fever (p=0.001) and CHI (p=0.003) Comprehension equivalent for <HS educ and ≥HS educ level w/video intervention, but stat sig diff within control group.	Level II	Dx: fever and CHI Uses level of educ as literacy marker

Edward, J., Carreon, L. Y., Williams, M. V., Glassman, S., & Li, J. (2018). *The importance and impact of patients' health literacy on low back pain management: a systematic review of literature*. *18*(2), 370–376.	Systematic Review of Literature Search of 4 databases yielded 3 studies meeting criteria to utilize direct measures for HL or an effort to address HL in programs for LBP specifically Study #1 – focused on beliefs around LBP on seeking, understanding, and using LBP information Study #2: measured attitudes towards health b/w chronic LBP and no LBP in relation to differences in HL Study #3: relationship b/w HL and patient empowerment	Study #1: N=117 – Australia, all participants had adequate HL when assessed using S-TOFHLA Study #2: compared chronic LBP (n=44) to no LBP (n=36), Australia Study #3: n=273, Italy and Switzerland	Study #1: Mixed methods approach Study #2: independent t-tests and chi-square #3: correlation r=0.09, p>0.05	Paucity of literature connecting HL Study #1: no sig correlation b/w HL, LBP, and disability, but emphasized importance of applying HL principles in eval and mgmt LBP Stat sig correlation b/w HL and health mgmt. through pts seeking health information Study #2: HeLMS score in r/t attitudes toward health self-mgmt are the central HL concern in individuals w/LBP Study #3: no sig relationship b/w HL and pt empowerment	Level 1	Most studies found during review focused on pt educ levels to address educ program interventions – not HL HeLMS – Health Literacy Measurement Scale HL as barrier to optimal health mgmt. Review reveals knowledge gaps in EB research on HL and LBP Limitations: studies outside US
Newnham, H., Barker, A., Ritchie, E., Hitchcock, K., Gibbs, H., & Holton, S. (2017). *Discharge*	Systematic Review d/c communication practice and identify preferred practice	Search methods 5 databases *Inclusion:* Peer-reviewed, English	Papers reviewed using Standard Quality Assessment Criteria for	Review of papers: 3 methods used to provide d/c info: IT, person-based, and written	Level I	Directional findings indicating need for innovative tools for enhanced d/c as

communication practices and healthcare provider and patient preferences, satisfaction, and comprehension: A systematic review. *29*(6), 752–768.	30 papers meeting inclusion	*Exclusion:* conducted in 'low' or 'lower middle' income countries	Evaluation Primary Research Papers Aggregative synthesis of qualitative and quantitative papers to review d/c communication practices, measure satisfaction/preference and pt comprehension	Utilizing technology to deliver d/c info is preferred by healthcare providers and pts and improves understanding of their medical condition and d/c inst		these are well received Redesigning d/c w/ IT solutions has potential to improve communications
Goessl, C., Estabrooks, P., You, W., Britigan, D., DeAlba, A., & Almeida, F. (2019). *Effectiveness of DVD vs. group-initiated diabetes prevention on information uptake for high & low health literacy participants*. *102*(5), 968–975.	RCT Comparison of the effectiveness of a DVD vs an in-person grp DM class to enhance comprehension; learning objectives based on HL status Standard care: DM class, interactive w/ teach back Intervention: DVD format with f/u for teach back	Control (class n=225) Intervention (DVD n=217) Community clinic, Eastern US *Inclusion:* age ≥18yrs, BMI ≥25; *Exclusion:* DM, pregnant, non-English speaking, or medically incapable	Chi square analysis for condition (DVD vs class) and HL level (high vs low), regression analysis to examine relationships	DVD sig better across teach back questions and demonstrated comprehension in fewer teach back rounds and answered more correct on 1st try. Models for HL levels were stat sig favoring DVD	Level II	Newest Vital Sign tool used for HL assessment Varying degrees of HL prompt effective interventions
Hoek, A. E., Anker, S. C. P., Ed,F., van B., Burdorf, A., Rood, P. P. M., & Haagsma, J. A. (2020). *Patient*	Systematic Review and Meta-analysis Overview of different manners of providing d/c	Search of 5 databases 51 articles: 12 verbal d/c, 30	Mixed methods I^2 statistic used for heterogeneity	Recall verbal d/c 47%, written 58%, and video 67%	Level I	Duration b/w d/c inst and measuring recall influences outcome

Discharge Instructions in the Emergency Department and Their Effects on Comprehension and Recall of Discharge Instructions: A Systematic Review and Meta-analysis. *75*(3), 435–444.	inst and effects on comprehension and recall of dx, tx, f/u, and return inst	written d/c, and 7 video d/c Meta-analysis verbal (n=1,460), written (n=3,395), and video (n=459) *Inclusion:* d/c performed in ED; *Exclusion:* no measurement of recall/comprehen-sion				Discusses optimal d/c in ED
Jové-Blanco, A., Solís-García, G., Torres-Soblechero, L., Escobar-Castellanos, M., Mora-Capín, A., Rivas-García, A., Castro-Rodríguez, C., & Marañón, R. (2020). *Video discharge instructions for pediatric gastroenteritis in an emergency department: a randomized, controlled trial*. *180*(2), 569–575.	RCT intervention of video d/c inst to control of verbal inst only to measure comprehension pre- and post-test comparison (time of d/c and 3-5-day telephone f/u), primary outcome measurement of test score differences	N=118 Pediatric ED, tertiary-care center, Spain *Inclusion:* Caregivers of pts 1 month to 16 years meeting dx criteria, for AGE, Spanish speaking; *Exclusion:* severe dehydration, chronic comorbidities complicating dx, or admitted.	Adequate sample for 80% power at 5% α to detect 2-tail diff of points b/w grps. The difference in test point using Student t-test and differences in proportions using chi square. P<0.05	Intervention grp (1.17pts, SD 1.11) had stat sig improvement than control group (0.47pts, SD 0.94, p<0.001) in initial test scores. f/u test int grp (49.1%) and control grp (18.6%) answered all quest correct (p<0.001) No sig difference in return visits	Level II	Dx: AGE Length of ED visit evaluated, videos did not add extra time to visit HL level was not assessed (educ level was)
Wilkin, Z. L. (2020). *Effects of Video Discharge*	Prospective RCT	N=60; control (n=30); intervention (n=30)	Independent sample t-test, data not evenly	Stat sig difference in mean discharge knowledge scores	Level II	Dx: URI, pharyngitis, or AGE

Instructions on Patient Understanding: A Prospective, Randomized Trial. *42*(1), 71–78.	Measure pt understanding of d/c b/w standard inst and video inst Pre- post-test f/u	Military Hospital ED, Southwest US *Inclusion:* Adults 18 to 89 yrs meeting dx criteria *Exclusion:* Admission or dx with 2 or more preidentified illness	distribute w/equal variance, so the Wilcoxon's rank sum test was used to validate results. Ordinal data w/ 95% confidence intervals p≤0.05 Adequate powered at 80% with sample size	b/w grps receiving video instruction and those receiving standard care (4.53 vs 4; p =0.009)		32% people insured in military health system have HL at basic or below basic Standard d/c: preprinted written
Dermody, S., Hughes, M., & Smith, V. (2021). *The Effectiveness of Pictorial Discharge Advice Versus Standard Advice Following Discharge From the Emergency Department: A Systematic Review and Meta-Analysis*. *47*(1), 66-75.e1.	Systematic Review and meta-analysis Purpose to determine the effectiveness of pictorial discharge advice in the ED compared with standard discharge Outcome measures were comprehension, compliance w/ advice, and reattendance rates	4 databases searched 4 studies identified ED settings in US *Inclusion:* RCT reporting on adult or children d/c'd from ED w/ pictorial inst, English language Study 1 (n=101) Study 2 (n=205) Study 3 (n=796) Study 4 (n=245)	Meta-analysis performed when more than 1 study included the same outcome measure. Dichotomous outcome RR and 95% CI were calculated to provide an overall effect est. I^2 statistic used for heterogeneity	Comprehension improved significantly with pictorial d/c compared to standard (RR=2.53; 95% CI 1.19-5.35); I^2 = 89%, 3 studies, (n=329)	Level I	Pictograms used as intervention 3of4 studies were from 1990's (may have effect on level of technology)
Hoek, A. E., Joosten, M., Dippel, D. W. J., Ed,F., van B., van	Multicenter RCT	Control (n=381); intervention (n=390)	Adequate power to 80%, (sig α=0.05)	The severity of post-concussive sx in mild TBI did not	Level II	Dx; post concussive sx in pts w/ mild TBI

den Hengel, L., Dijkstra, B., Papathanasiou, D., van Rijssel, D., van den Hamer, M., Schuit, S. C. E., Burdorf, A., Haagsma, J. A., & Rood, P. P. M. (2021). *Effect of Video Discharge Instructions for Patients with Mild Traumatic Brain Injury in the Emergency Department: A Randomized Controlled Trial*. *77*(3), 327–337.	Intervention (verbal, written, and video d/c inst); control (verbal and written only) Primary outcome: Rivermead post-concussion questionnaire results at 3 months	6 different EDs in the Netherlands *Inclusion*: adult pts meeting dx criteria for mild TBI, Dutch language *Exclusion:* abnormalities on CT scan or focal neurologic deficit	Tested sociodemographic chx of respondents in control and intervention grp using a chi square test for categoric variables and the Mann-Whitney U test and independent sample t-test for continuous variables p≤0.05	improve w/video d/c. Control grp: 1 wk mean RPQ 11.4 (95% CI 10.3 to 12.4); 3 mos mean RPQ 8.7 (95% CI 7.6 to 9.8) Intervention grp: 1 wk mean RPQ 11.6 (95% CI 10.4 to 12.8); 3mos mean RPQ 9 (95% CI 7.9 to 10.2) Recall differences were not significant b/w grps.	Comparison of intervention to sx control at 3 months using RPQ showing no stat diff

Legend: AGE – acute gastroenteritis; ANOVA – analysis of variance; BMI – body mass index; BP – blood pressure; CC – chief complaint; CHI – closed head injury; CI – confidence interval; d/c – discharge; diff – difference; dx – diagnosis; EB – evidence-based; ED – emergency department; educ – education; ESI – Emergency Severity Index; est – estimate; Exp – Experiment; f/u – follow-up; grp – group; GERD – gastroesophageal reflux disease; HL – health literacy; HS – high school; HTN – hypertension; hx – history; ins – instructions; int – intervention; IT – information technology; LBP – low back pain; phys – physician; pt – patient; RCT- randomized control trial; REALM-R – Rapid Estimate of Adult Literacy in Medicine-Revised; RPQ - Rivermead Post-Concussion Questionnaire; RR relative risk; s-TOFHLA – Short Test of Functional Health Literacy; SD – standard deviation; sig – significant; stat – statistical; TBI – traumatic brain injury; URI - upper respiratory infection; US – United States; VAR – variable; vs – versus; wk - week

Figure A2

Synthesis Table

Study/ Authors	Country/ Setting	Purpose	Targeted Intervention	Health Literacy Screening	Outcome	Diagnosis
(Giuse et al., 2012)	USA; ED	Impact of administering information tailored to HL level alone or in combination w/preferred learning style on pt.'s understanding of HTN	HL level (5th grade or 8th grade) core and supplemental materials, learning preference (V – charts/illustrations, A – audio version, RW – chart/bullet statements, K – card sorting activity)	YES, s-TOFHLA	+C at 2 wk. f/u	HTN
(McCarthy et al., 2012)	USA; health clinic	Assess how well patients remember spoken physician medical instruction and exam whether those with limited literacy skills were less able to retain information	Verbal Instructions (standardized through video simulation); teach-back for understanding	YES, TOFHLA	Decreased Recall r/t low HL level Resulted in greater number of teach-back sessions needed	GERD and wound care
(Atzema et al., 2013)	Canada; ED	Determine the effect of online videos on pt. understanding and recall of d/c instructions.	Video	NO	+ C at 3–5-day f/u. + satisfaction	38 different diagnoses
(Bloch & Bloch, 2013)	USA; Ped ED	Propose video d/c instructions will improve	Video	NO	+ C at 2–5-day f/u fever, V/D.	Fever, V/D, and asthma

		caregiver's comprehension of child's medical condition, treatment, and follow-up			No sig + w/asthma	
(Goodman et al., 2015)	USA; OB/GYN clinic	To investigate the impact of office-based video education on influenza health beliefs and vaccination uptake among pregnant women	Video	NO	+ Health beliefs. No change in health behavior	Unvaccinated Pregnant Women
(Griffey et al., 2015)	USA; ED	Evaluate efficacy of teach-back in improving comprehension at the time of d/c among low HL patients in ED	Teach-back; written and verbal	YES, REALMS	Post d/c + C of medications, self-care, and f/u instructions No improvement in recall @ 2wks no change in satisfaction or perceived comprehension	All diagnoses
(Ismail et al., 2016)	USA; PED ED	To determine if video d/c instructions when added to usual care improve caregiver's comprehension of child's dx, disease	Video	NO; however, differences in C were compared to education level	+ C at time of d/c	Fever and CHI

		process, and d/c instructions				
(Edward et al., 2018)	Australia, Switzerland	Review of literature to examine the importance and the implications of HL in treatment and management of LBP	HL screening	YES, s-TOFHLA, HELMS, LBPK	HL as a determinant for health outcomes Health beliefs, information seeking, and attitudes directly affected by HL levels.	LBP
(Newnham et al., 2017)	10 countries; hospital and ED	Identify evidence for the provision of care from hospital to community	IT methods, person-based, and written	NO	IT methods most common preferred by providers and patients.	Varied
(Goessl et al., 2019)	USA; outpatient clinic	Study the effectiveness of a technology or in-person facilitated approach to enhance pt. comprehension of learning objectives based on HL status	Video	YES, Newest Vital Sign tool	+ C at 4-5 day teach-back session	DM prevention
(Hoek et al., 2020)	Limited to English-speaking; ED	Outcome measure was comprehension and recall of d/c instructions after ED visit	Verbal, Written, Video	NO	+ C and + recall w/ video over other interventions	Varied
(Jové-Blanco et al., 2020)	Spain; Ped ED	Evaluate if addition of video d/c improved the comprehension of information provided to caregivers of pts w/AGE	Video	NO	+ C at 72 hrs. + satisfaction	AGE

(Wilkin, 2020)	USA; ED	Evaluate the effects of video instructions on patient understanding of their d/c instructions	Video	Indirect. Education level	+ C w/ post-test assessment	URI, pharyngitis, or AGE
(Dermody et al., 2021)	USA; ED	Primary outcome measure was patient and carer's comprehension	Pictorial	NO	+ C w/intervention. + satisfaction with advice, but not overall ED visit	Varied
(Hoek et al., 2021)	Netherlands; ED	Measure post concussive symptom mgmt. secondary measurement of recall.	Video	NO	C not changed at 1 or 3 mos. f/u; satisfaction improved but not statistically sig change	TBI
Legend: A – aural; AGE – acute gastroenteritis; C – comprehension; CHI – closed head injury; D/C – discharge; DM – diabetes mellitus; dx – diagnosis; ED – emergency department; f/u – follow up; GERD – gastroesophageal reflux; HELMS – Health Literacy Management Scale; HL – health literacy; HTN – hypertension; K – kinesthetic; LBPK – Low Back Pain Knowledge Test; PED – pediatric; pt – patient; R – read; S-TOFHLA – Short Test of Functional Health Literacy; TBI – traumatic brain injury; URI – upper respiratory infection; V – visual; V/D – vomiting/diarrhea; W – write; wk - week						

Appendix B

Project Tools

Health Literacy and the Feasibility of Using Video-Based Education in the Emergency Department

For the project titled, "Health Literacy and the Use of a Video Education Tool in The Emergency Department," data collection, as well as the intervention, was introduced to the participant through an application-based Google Form that is accessible via a quick response (QR) code. A brochure explaining the education intervention and providing the QR code was handed out to the defined population (**see Attachment**). The following data collection was performed:

Demographics

1) How old are you?
   a) Less than 18 years old
   b) 18 - 30 years old
   c) 31 – 40 years old
   d) 41 – 50 years old
   e) 51 – 60 years old
   f) 61 – 70 years old
   g) 71 years or older

2) Gender
   a) Male
   b) Female
   c) Other
   d) Prefer not to say

3) What is your highest level of education?
   a) Less than high school
   b) High school graduate
   c) Some college
   d) Bachelor's Degree
   e) Master's Degree
   f) Post-Master's Degree or Doctorate

Health Literacy

Taken from the publication, “Brief Questions to Identify Patients with Inadequate Health Literacy “ (Chew et al., 2004). The categorical responses are assigned a numerical value of 0 through 5. The higher scores are predictive of inadequate health literacy skills.

1) How often do you have someone help you read hospital materials?
   a) Never
   b) Occasionally
   c) Sometimes
   d) Often
   e) Always

2) How confident are you filling out medical forms by yourself?
   a) Extremely
   b) Quite a bit
   c) Somewhat
   d) A little bit
   e) Not at all

3) How often do you have problems learning about your medical condition because of difficulty understanding written information?
   a) Never
   b) Occasionally
   c) Sometimes
   d) Often
   e) Always

Experience and Beliefs

1) Have you had back pain before?
   a) Yes
   b) No

2) What have you tried to make your back pain better?
   a) Short Answer

3) Have you been seen in an emergency department before for this same problem?
   a) Yes
   b) No

4) Have you seen, or do you currently see, a primary care provider or specialist for this same problem?
   a) Yes
   b) No

5) What do you think caused your pain today?
    a) Short Answer

6) Why did you choose to come to the emergency department today for your back pain?
    a) Short Answer

Pre- and Post-Test

Taken from the Low Back Pain Knowledge Questionnaire (LKQ) (Maciel et al., 2009).

The purpose of this questionnaire is to evaluate the patient's knowledge of back pain.

1. What is acute low back pain? Mark ONE correct answer:
    a. pain in the lumbar region that usually improves in three weeks, with or without treatment
    b. untreatable pain in the lumbar region
    c. pain in the lumbar region requiring surgery
    d. pain in the lumbar region lasting more than 3 months
    e. I don't know.
2. What is sciatica pain? Mark ONE correct answer:
    a. pain located between the lowest ribs and the pelvis
    b. pain between the lowest ribs and the pelvis that radiates to the leg down to the foot
    c. pain in any region of the back, from the neck to the hip
    d. pain in the abdomen, lower part of the pelvis or kidneys
    e. I don't know.
3. These are symptoms of low back pain. Mark TWO correct answers:
    a. a cough, sluggishness, and loss of energy
    b. tiredness and pain throughout the body
    c. pain in the lumbar region that worsens when carrying weight
    d. difficulty in picking up objects from the floor
    e. I don't know.
4. What is needed for the diagnosis of low back pain? Mark TWO correct answers:
    a. Magnetic resonance imaging (MRI) and computerized tomography (CT scan) are always needed.
    b. An x-ray is not always needed.
    c. The diagnosis is often possible through the medical history and physical exam of the patient without the need of supplementary exams.
    d. laboratory tests such as glycemia, cholesterol and urine are always needed.
    e. I don't know.
5. In regards to the treatment for acute low back pain. Mark TWO correct answers:
    a. One week of absolute bed rest is indicated.

b. Definitive sick leave from work is indicated.
c. Low back pain may improve even without treatment.
d. The least possible rest is indicated.
e. I don't know.

6. In regards to physical activity and low back pain, mark ONE incorrect answer:
   a. Walking three times a week for an hour can improve chronic low back pain.
   b. Intensive exercises are indicated for acute low back pain.
   c. Aquatic activities may be beneficial to the patient with chronic low back pain.
   d. The most highly recommended exercises are strengthening of the abdomen and the back muscles, stretching and physical conditioning.
   e. I don't know.
7. In relation to spinal protection, mark ONE incorrect answer:
   a. You should get out of bed carefully, turning sideways with the help of our hands.
   b. Avoid carrying too much weight on one side of the body (divide the load between both arms).
   c. Avoid twisting of the spine.
   d. Wear high heels all day.
   e. I don't know.
8. In regards to acute low back pain, mark TWO correct answers:
   a. The great majority of patients recover in three weeks.
   b. After recovery and improvement of the pain, the patient is cured and there is no risk of further crises.
   c. Instructions on how to protect the spine are only important during the crisis.
   d. The orientations for spine protection and energy conservation should be routine in patients with a history of low back pain because relapses are frequent.
   e. I don't know.
9. In regards to surgical treatment for low back pain, mark TWO correct answers:
   a. It is indicated in few cases.
   b. It may be important in cases with nerve root compression and spinal column instability that do not improve with clinical treatment.
   c. Surgery guarantees the cure of low back pain.
   d. It is the best treatment for any type of low back pain
   e. I don't know.

Video Interventions

Low Back Pain: Basic Information and Steps Towards Healing (American Association of Neurological Surgeons [AANS], 2020) https://youtu.be/4181JkyKRHY

Preventing and Relieving Back Pain: Tips and Exercises to Manage Back Pain

(University of Florida Emergency Medicine Research, 2017) https://youtu.be/Sv6lwUF0skE

Patient Satisfaction and Feedback

1) I understand health information better by watching videos than by reading about it.
   a) Strongly agree
   b) Agree
   c) Somewhat agree
   d) Do not agree

2) This video improved my understanding of back pain.
   a) Strongly Agree
   b) Agree
   c) Somewhat agree
   d) Do not agree

3) I understand what to do next.
   a) Strongly Agree
   b) Agree
   c) Somewhat agree
   d) Do not agree

4) I would like to see more educational videos when I go to the emergency department.
   a) Strongly Agree
   b) Agree
   c) Somewhat agree
   d) Do not agree

5) This video improved the experience of my visit to the emergency department.
   a) Strongly Agree
   b) Agree
   c) Somewhat agree
   d) Do not agree

6) If I need more information about back pain, I prefer:
   a) Watching videos about back pain
   b) Reading information about back pain
   c) Both
   d) Neither

Appendix C

Detailed Timeline

Fall 2021 – Evidence for Healthcare

1. Problem identification and literature review

Spring 2022 - Project Proposal

1. Identify Advisory Committee
2. Identify intervention and generate project tools
3. Complete project paper; completion by April 8, 2022.
4. Generate project proposal in collaboration with faculty chair; completion by April 8, 2022.
5. Facility approval letter; completion by April 22, 2022.
6. Proposal defense to advisory committee; scheduled April 22, 2022.
7. Submit project to IRB; May 2022.

Summer 2022 – Project Implementation

1. Implementation of project at approved clinical site; process to proceed through December 2022.
2. Initiate data collection activities: process to proceed through Spring 2023.

Spring 2023 – Project Defense

1. Complete data collection; completion by April 2023.
2. Complete project paper and submit through iThenticate; completion by March 1, 2023.
3. Submit approved paper to advisory committee; completion by April 1, 2023 (no later than 2 weeks prior to scheduled defense).

4. Project Defense; April 2023 (date TBD)
5. Submit final paper to Graduate College; completion by May 2023.

Appendix D

Detailed Project Tasks

Project Proposal Tasks –

a. Form a faculty advisory committee in collaboration with faculty chair.
b. Develop an intervention by obtaining or creating a video that includes the key indicators for quality ED discharge education on the topic of back pain.
c. Research validated and feasible tools of measurement for defined objectives and generate an educational tool to deliver the project intervention.
d. Work with statistician to determine outcome measures.
e. Identity and garner facility site approval.
f. Identify and gain permission for EMR access to generate reports for de-identified patient data.
g. Generate a written DNP project plan for proposal defense.
h. Generate an oral presentation of DNP project plan for proposal defense.
i. Defend project proposal.
j. Revise and amend project based upon advisory committee feedback.

Project Implementation Tasks –

a. Submit final project to IRB for approval.
b. Generate script and educate nursing and medical staff about project implementation and subject identification.

c. Post project reminders to nursing and medical staff in common areas; provider office, triage station, and staff breakroom/bathroom.

d. Develop patient consent form.

e. Perform tasks for subject identification and recruitment for project.

f. Gather data from completed education tools.

Project Defense Tasks –

a. Complete data collection.

b. Complete final written project paper and submit through iThenticate.

c. Submit approved written paper to advisory committee members.

d. Complete oral presentation for DNP project defense.

e. Defend DNP project.

f. Revise and submit final DNP project materials to UNLV Graduate College.

Appendix E

Letter of Authorization to Conduct DNP Project at Facility

Centennial Hills Hospital
MEDICAL CENTER
A Member of The Valley Health System

Letter of Authorization to Conduct DNP Project at Facility

University of Nevada, Las Vegas
School of Nursing, Doctor of Nursing Practice Program
CC: Dr. Kathleen Thimsen, Faculty Chair
University of Nevada Las Vegas
4505 Maryland Parkway
Las Vegas, NV 89154

Subject: Letter of Authorization to Conduct DNP Project at Facility

Dear UNLV SON DNP program:

This letter will serve as authorization for the University of Nevada, Las Vegas ("UNLV") DNP candidate, Jenifer Carvell, to conduct the DNP project entitled "Health Literacy and the Use of a Video Education Tool in the Emergency Department" at Centennial Hills Hospital Medical Center, 6900 N. Durango Drive, Las Vegas, Nevada (the "Facility").

The Facility acknowledges that it has reviewed the protocol presented by the researcher, as well as the associated risks to the Facility. The Facility accepts the protocol and the associated risks to the Facility and authorizes the DNP project to proceed. The DNP project may be implemented at the Facility upon approval from the UNLV School of Nursing.

If we have any concerns or require additional information, we will contact the DNP candidate, the UNLV Quality Improvement Review Committee, and/or the Faculty Chair, Dr. Kathleen Thimsen at Kathleen.Thimsen@UNLV.edu.

Sincerely,

Janet W

Facility's Authorized Signatory

3/28/22

Date

Janet Wright - CNO

Printed Name and Title of Authorized Signatory

Appendix F

Patient Consent Form

INFORMED CONSENT

Department of Nursing

TITLE OF STUDY: Health Literacy and the Feasibility of Using Video-Based Education in the Emergency Department: An Intervention to Improve Comprehension of Discharge Instructions

INVESTIGATOR(S): Jenifer Carvell, MBA, MSN, APRN, FNP-C, ENP-C

For questions or concerns about the study, you may contact Jenifer Carvell at **carvellj@unlv.nevada.edu**

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-581-2794 or via email at IRB@unlv.edu.**

Purpose of the Study

You are invited to participate in a research study. The purpose of these study is to implement an evidence-based intervention using technology to deliver a video-based discharge instruction to adult patients in a community emergency department to improve comprehension of material and assess satisfaction with the discharge method.

Participants

You are being asked to participate in the study because you presented to the emergency department with back pain and you will be given education for discharge.

Procedures

If you volunteer to participate in this study, you will be asked to complete a Google form with questions about basic demographics, pre-existing health beliefs and experiences, health literacy measurements, pre- and post-test comprehension scores of education material, and satisfaction with method. You will be asked to watch two short videos about back pain, approximately 3 minutes each.

Benefits of Participation

There may be direct benefits to you as a participant in this study. You will receive information about the disease process, treatment plan, follow-up instructions, and reasons to return to the ED for low back pain to improve comprehension and self-management of your symptoms.

Risks of Participation
There are risks involved in all research studies. This study includes minimal psychological risks and no risk of physical harm. Anticipated risks include embarrassment about your level of understanding of the information, feeling uncomfortable about answering personal questions, or unwillingness to complete the tool.

Cost /Compensation
There will be no financial cost to you to participate in this study. The study will take approximately 10 minutes to complete. You will not be compensated for your time.

Confidentiality
All information gathered in this study will be kept as confidential as possible. No reference will be made in written or oral materials that could link you to this study. The information you provide will in no way be associated with your visit today and all information given will be kept anonymous. You will never be asked to provide your name or any contact information. Consent forms will not be matched to completed education tools, so any information you provide through the Google form will never be matched to you personally.

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with UNLV. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Consent:
I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

_____ _____
Signature of Participant Date

_____
Participant Name (Please Print)

Appendix G

ORI-HS, Exempt Review
Exempt Notice

DATE: August 2, 2022

TO: Kathleen Thimsen
FROM: Office of Research Integrity - Human Subjects

PROTOCOL TITLE: UNLV-2022-242 Health Literacy and the Feasibility of Using Video-based Education in the Emergency Department: An intervention to improve comprehension of discharge instructions
SUBMISSION TYPE: Initial

ACTION: Exempt
REVIEW DATE: August 2, 2022
REVIEW TYPE: EXEMPT
REVIEW CATEGORY: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).
The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects.

This memorandum is notification that the protocol referenced above has been reviewed as indicated in Federal regulatory statutes 45 CFR 46 and deemed exempt under Exempt Category 2(i) as noted in the Review Category.

PLEASE NOTE:

- **Prior to distribution of the Informed Consent Form, please remove the verbiage, "toll free at 877-581-2794." Once removed you can distribute the Informed Consent Form.**

Upon final determination of exempt status, the research team is responsible for conducting the research as stated in the exempt application reviewed by the ORI – HS, which shall include using the most recently submitted Informed Consent/Assent and recruitment materials.

If your project involves paying research participants, it is recommended to contact HSComp@unlv.edu to ensure compliance with the Policy for Incentives for Human Research Subjects.

Any changes to the application may cause this study to require a different level of review. Should there be any change to the study, it will be necessary to submit a **Modification** request for review. No changes may be made to the existing study until modifications have been approved/acknowledged.

All **unanticipated problems** involving risk to subjects or others, and/or **serious and unexpected adverse events** must be reported promptly to this office.

Any **non-compliance** issues or **complaints** regarding this protocol must be reported promptly to this office.

DELETE IF NOT RELEVANT: Waiver of HIPAA Authorization has been approved for this study.

Please remember that all approvals regarding this research must be sought prior to initiation of this study (e.g., IBC, COI, Export Control, OSP, Radiation Safety, Clinical Trials Office, etc.).

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your study title and study ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

References

Alexander, K. E., Ogle, T., Hoberg, H., Linley, L., & Bradford, N. (2021). Patient preferences for using technology in communication about symptoms post hospital discharge. *BMC Health Services Research*, *21*(1). https://doi.org/10.1186/s12913-021-06119-7

Atzema, C. L., Austin, P. C., Wu, L., Brzozowski, M., Feldman, M. J., McDonnell, M., & Mazurik, L. (2013). Speak fast, use jargon, and don't repeat yourself: A randomized trial assessing the effectiveness of online videos to supplement emergency department discharge instructions. *PLoS ONE*, *8*(11), e77057. https://doi.org/10.1371/journal.pone.0077057

Balakrishnan, M. P., Herndon, J., Zhang, J., Payton, T., Shuster, J., & Carden, D. L. (2017). The association of health literacy with preventable emergency department visits: A cross-sectional study. *Academic Emergency Medicine*, *24*(9), 1042–1050. https://doi.org/10.1111/acem.13244

Bloch, S. A., & Bloch, A. J. (2013). Using video discharge instructions as an adjunct to standard written instructions improved caregivers' understanding of their child's emergency department visit, plan, and follow-up. *Pediatric Emergency Care*, *29*(6), 699–704. https://doi.org/10.1097/pec.0b013e3182955480

Champion, V. L., & Skinner, C. S. (2008). The health belief model. In *Health behavior and health education: theory, research, and practice* (4th ed., pp. 45–63). Jossey-Bass.

Chartier, L. B., Cheng, A. H., Stang, A. S., & Vaillancourt, S. (2017). Quality improvement primer part 1: Preparing for a quality improvement project in the emergency department. *CJEM*, *20*(1), 104–111. https://doi.org/10.1017/cem.2017.361

Chew, L. D., Griffin, J. M., Partin, M. R., Noorbaloochi, S., Grill, J. P., Snyder, A., Bradley, K. A., Nugent, S. M., Baines, A. D., & VanRyn, M. (2008). Validation of screening questions for limited health literacy in a large va outpatient population. *Journal of General Internal Medicine*, *23*(5), 561–566. https://doi.org/10.1007/s11606-008-0520-5

Collins, S. A., Currie, L. M., Bakken, S., Vawdrey, D. K., & Stone, P. W. (2012). Health literacy screening instruments for ehealth applications: A systematic review. *Journal of Biomedical Informatics*, *45*(3), 598–607. https://doi.org/10.1016/j.jbi.2012.04.001

Dermody, S., Hughes, M., & Smith, V. (2021). The effectiveness of pictorial discharge advice versus standard advice following discharge from the emergency department: A systematic review and meta-analysis. *Journal of Emergency Nursing*, *47*(1), 66–75.e1. https://doi.org/10.1016/j.jen.2020.07.005

Edward, J., Carreon, L., Williams, M. V., Glassman, S., & Li, J. (2018). The importance and impact of patients' health literacy on low back pain management: A systematic review of literature. *The Spine Journal*, *18*(2), 370–376. https://doi.org/10.1016/j.spinee.2017.09.005

Eltorai, A., Ghanian, S., Adams, C., Born, C., & Daniels, A. (2014). Readability of patient education materials on the american association for surgery of trauma website. *Archives of Trauma Research*, *3*(1). https://doi.org/10.5812/atr.18161

Giuse, N. B., Koonce, T. Y., Storrow, A. B., Kusnoor, S. V., & Ye, F. (2012). Using health literacy and learning style preferences to optimize the delivery of health information. *Journal of Health Communication*, *17*(sup3), 122–140. https://doi.org/10.1080/10810730.2012.712610

Goessl, C., Estabrooks, P., You, W., Britigan, D., DeAlba, A., & Almeida, F. (2019). Effectiveness of dvd vs. group-initiated diabetes prevention on information uptake for high & low health literacy participants. *Patient Education and Counseling*, *102*(5), 968–975. https://doi.org/10.1016/j.pec.2018.12.026

Goodman, K., Mossad, S., Taksler, G., Emery, J., Schramm, S., & Rothberg, M. (2015). Impact of video education on influenza vaccination in pregnancy. *Journal of Reproductive Medicine*, *60*(11-12), 471–479.

Griffey, R. T., Kennedy, S. K., McGownan, L., Goodman, M., & Kaphingst, K. A. (2014). Is low health literacy associated with increased emergency department utilization and recidivism? *Academic Emergency Medicine*, *21*(10), 1109–1115. https://doi.org/10.1111/acem.12476

Griffey, R. T., Shin, N., Jones, S., Aginam, N., Gross, M., Kinsella, Y., Williams, J. A., Carpenter, C. R., Goodman, M., & Kaphingst, K. A. (2015). The impact of teach-back on comprehension of discharge instructions and satisfaction among emergency patients with limited health literacy: A randomized, controlled study. *Journal of Communication in Healthcare*, *8*(1), 10–21. https://doi.org/10.1179/1753807615y.0000000001

Health Resources and Services Administration. (2019, August). *Health Literacy*. U.S. Department of Health and Human Resources. Retrieved March 14, 2022, from https://www.hrsa.gov/about/organization/bureaus/ohe/health-literacy/index.html

Hoek, A. E., Anker, S. C., van Beeck, E. F., Burdorf, A., Rood, P. P., & Haagsma, J. A. (2020). Patient discharge instructions in the emergency department and their effects on comprehension and recall of discharge instructions: A systematic review and meta-

analysis. *Annals of Emergency Medicine*, *75*(3), 435–444. https://doi.org/10.1016/j.annemergmed.2019.06.008

Hoek, A. E., Joosten, M., Dippel, D. W., van Beeck, E. F., van den Hengel, L., Dijkstra, B., Papathanasiou, D., van Rijssel, D., van den Hamer, M., Schuit, S. C., Burdorf, A., Haagsma, J. A., & Rood, P. P. (2021). Effect of video discharge instructions for patients with mild traumatic brain injury in the emergency department: A randomized controlled trial. *Annals of Emergency Medicine*, *77*(3), 327–337. https://doi.org/10.1016/j.annemergmed.2020.10.023

Ismail, S., McIntosh, M., Kalynych, C., Joseph, M., Wylie, T., Butterfield, R., Smotherman, C., Kraemer, D. F., & Osian, S. R. (2016). Impact of video discharge instructions for pediatric fever and closed head injury from the emergency department. *The Journal of Emergency Medicine*, *50*(3), e177–e183. https://doi.org/10.1016/j.jemermed.2015.10.006

Jacobs, W., Amuta, A. O., & Jeon, K. (2017). Health information seeking in the digital age: An analysis of health information seeking behavior among us adults. *Cogent Social Sciences*, *3*(1), 1302785. https://doi.org/10.1080/23311886.2017.1302785

Johns Hopkins University, Armstrong Institute for Patient Safety and Quality. (2014). *Improving the emergency department discharge process: environmental scan report* (AHRQ Publication No, 14(15)-0067-EF). Agency for Healthcare Research and Quality.

Jové-Blanco, A., Solís-García, G., Torres-Soblechero, L., Escobar-Castellanos, M., Mora-Capín, A., Rivas-García, A., Castro-Rodríguez, C., & Marañón, R. (2020). Video discharge instructions for pediatric gastroenteritis in an emergency department: A randomized, controlled trial. *European Journal of Pediatrics*, *180*(2), 569–575. https://doi.org/10.1007/s00431-020-03827-w

Koh, H. K., Berwick, D. M., Clancy, C. M., Baur, C., Brach, C., Harris, L. M., & Zerhusen, E. G. (2012). New federal policy initiatives to boost health literacy can help the nation move beyond the cycle of costly 'crisis care'. *Health Affairs*, *31*(2), 434–443. https://doi.org/10.1377/hlthaff.2011.1169

Kutner, M., Greenberg, E., Jin, Y., Boyle, B., Hsu, Y., & Dunleavy, E. (2006). *The health literacy of America's adults: Results from the 2003 National Assessment of Adult Literacy* (U.S, Department of Education, National Center for Education Statistics). Washington, DC. https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007480

Levin-Zamir, D., & Bertschi, I. (2018). Media health literacy, ehealth literacy, and the role of the social environment in context. *International Journal of Environmental Research and Public Health*, *15*(8), 1643. https://doi.org/10.3390/ijerph15081643

Maciel, S., Jennings, F., Jones, A., & Natour, J. (2009). The development and validation of a low back pain knowledge questionnaire - lkq. *Clinics*, *64*(12). https://doi.org/10.1590/s1807-59322009001200006

McCarthy, D. M., Waite, K. R., Curtis, L. M., Engel, K. G., Baker, D. W., & Wolf, M. S. (2012). What did the doctor say? health literacy and recall of medical instructions. *Medical Care*, *50*(4), 277–282. https://doi.org/10.1097/mlr.0b013e318241e8e1

McIntyre, S., Dale, H., & Gabler, C. (2010). Building successful partnerships in health literacy. *Adult Basic Education and Literacy Journal*, *4*(1), 43–46. https://eric.ed.gov/?id=EJ877229

Newnham, H., Barker, A., Ritchie, E., Hitchcock, K., Gibbs, H., & Holton, S. (2017). Discharge communication practices and healthcare provider and patient preferences, satisfaction and

comprehension: A systematic review. *International Journal for Quality in Health Care*, *29*(6), 752–768. https://doi.org/10.1093/intqhc/mzx121

Office of Disease Prevention and Health Promotion. (n.d.). *Health Literacy* [Healthy People 2020]. U.S. Department of Health and Human Services. Retrieved March 11, 2022, from https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/health-literacy

Powers, B. J., Trinh, J. V., & Bosworth, H. B. (2010). Can this patient read and understand written health information? *JAMA*, *304*(1), 76. https://doi.org/10.1001/jama.2010.896

Rhodes, K. V., Vieth, T., He, T., Miller, A., Howes, D. S., Bailey, O., Walter, J., Frankel, R., & Levinson, W. (2004). Resuscitating the physician-patient relationship: Emergency department communication in an academic medical center. *Annals of Emergency Medicine*, *44*(3), 262–267. https://doi.org/10.1016/j.annemergmed.2004.02.035

Samuels-Kalow, M., Rhodes, K., Uspal, J., Reyes Smith, A., Hardy, E., & Mollen, C. (2016). Unmet needs at the time of emergency department discharge. *Academic Emergency Medicine*, *23*(3), 279–287. https://doi.org/10.1111/acem.12877

See, Y., Smith, H., Car, L., Protheroe, J., Wong, W., & Bartlam, B. (2021). Health literacy and health outcomes in patients with low back pain: A scoping review. *BMC Medical Informatics and Decision Making*, *21*(1). https://doi.org/10.1186/s12911-021-01572-0

Sheele, J. M., Bhangu, J., Wilson, A., & Mandac, E. (2019). Patient preference for medical information in the emergency department: Post-test survey of a random allocation intervention. *Journal of Emergency Nursing*, *45*(5), 517–522.e6. https://doi.org/10.1016/j.jen.2019.05.009

Sheikh, H., Brezar, A., Dzwonek, A., Yau, L., & Calder, L. A. (2018). Patient understanding of discharge instructions in the emergency department: Do different patients need different approaches? *International Journal of Emergency Medicine, 11*(1). https://doi.org/10.1186/s12245-018-0164-0

Shirey, M. (2013). Lewin's Theory of Planned Change as a strategic resource. *Journal of Nursing Administration, 43*(2), 69–72. https://www.jstor.org/stable/26811543

Squiers, L., Peinado, S., Berkman, N., Boudewyns, V., & McCormack, L. (2012). The health literacy skills framework. *Journal of Health Communication*, *17*(sup3), 30–54. https://doi.org/10.1080/10810730.2012.713442

U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *National action plan to improve health literacy*. Washington, DC: Author. https://health.gov/sites/default/files/2019-09/Health_Literacy_Action_Plan.pdf

Villamin, C., & Berg, K. (2018). Improving patient satisfaction with discharge videos: Standardizing patient education with technology establishes a culture of patient safety. *American Nurse Today*, *13*(9). https://link.gale.com/apps/doc/A559525151/AONE?u=unlv_main&sid=bookmark-AONE&xid=32ad2f70

Weiss, A. J., & Jiang, H. J. (2021). *Most frequent reasons for emergency department visits, 2018* (Healthcare Cost and Utilization Project) [Statistical Brief #286]. Agency for Healthcare Research and Quality. https://hcup-us.ahrq.gov/reports/statbriefs/sb286-ED-Frequent-Conditions-2018.pdf

Weiss, B. D. (2018). The newest vital sign: Frequently asked questions. *HLRP: Health Literacy Research and Practice*, *2*(3). https://doi.org/10.3928/24748307-20180530-02

Wilkin, Z. L. (2020). Effects of video discharge instructions on patient understanding. *Advanced Emergency Nursing Journal*, *42*(1), 71–78. https://doi.org/10.1097/tme.0000000000000279

World Health Organization. (2021, February 8). *Musculoskeletal disorders*. Retrieved March 10, 2022, from https://www.who.int/news-room/fact-sheets/detail/musculoskeletal-conditions

Wray, A., Goubert, R., Gadepally, R., Boysen-Osborn, M., Wiechmann, W., & Toohey, S. (2021). Utilization of educational videos to improve communication and discharge instructions. *Western Journal of Emergency Medicine*, *22*(3). https://doi.org/10.5811/westjem.2021.1.48968

Ylitalo, K. R., Meyer, M., Lanning, B. A., During, C., Laschober, R., & Griggs, J. O. (2018). Simple screening tools to identify limited health literacy in a low-income patient population. *Medicine*, *97*(10), e0110. https://doi.org/10.1097/md.0000000000010110

Zheng, M., Jin, H., Shi, N., Duan, C., Wang, D., Yu, X., & Li, X. (2018). The relationship between health literacy and quality of life: A systematic review and meta-analysis. *Health and Quality of Life Outcomes*, *16*(1). https://doi.org/10.1186/s12955-018-1031-7

Curriculum Vitae

Jenifer A. Carvell, MBA, MSN, APRN, FNP-C, ENP-C
jenifercarvell@gmail.com

Academic Preparation

Present. University of Nevada, Las Vegas; Las Vegas, Nevada
Doctor of Nursing Practice Candidate
Graduation Spring 2023

December 2015. University of Nevada, Las Vegas; Las Vegas, Nevada
Master of Science in Nursing
Family Nurse Practitioner track

December 2004. Webster University; St. Louis, Missouri
Master of Business Administration
Graduated with academic honors

May 2000. University of Alabama in Huntsville; Huntsville, Alabama
Bachelor of Science in Nursing
Cum Laude

Professional Licenses

- Advanced Practice Registered Nurse in Nevada; License number APRN002134
- Registered Nurse in Nevada; License number RN65839

National Board Certifications

2019 to present. Emergency Nurse Practitioner – American Academy of Nurse Practitioners
2016 to present. Family Nurse Practitioner - American Academy of Nurse Practitioners

Advanced Certifications

- Advanced Cardiac Life Support (ACLS) provider
- Pediatric Advanced Life Support (PALS) provider
- Basic Life Support (BLS) provider

Honors and Awards

- Honor Graduate, United States School of Aerospace Medicine
  Top of Class #1/36 flight school graduates
- Sigma Theta Tau International Honor Society of Nursing
- Phi Kappa Phi Interdisciplinary Honor Society

Membership in Professional Organizations

- American Association of Emergency Nurse Practitioners (AAENP)
- American Association of Nurse Practitioners (AANP)
- Western Regional Advanced Practice Nurses Network (WRAPNN)

Professional Experience

5/2016 to present. Nurse Practitioner, Emergency Medicine
Doctors Medical Services (DMS) – Envision Physician Services, Las Vegas, Nevada

1/2021 to 4/2022. Clinical Preceptor, Family Nurse Practitioner
J.D. DNP student, Johns Hopkins University

1/2020 to 4/2020. Clinical Preceptor, Family Nurse Practitioner
S.M. MSN student, Graceland University

4/2011 to 4/2016. Registered Nurse, Emergency Department
Summerlin Hospital and Medical Center, Las Vegas, Nevada

10/2010 to 10/2012. USAF Individual Ready Reserve Member, USAF Reserves
Voluntary separation from active duty with voluntary transition to the USAF reserve component

9/2008 to 10/2010. Nurse Manager, Internal Medicine Clinic;
Infection Control Program Manager
35th Medical Group, Misawa Air Base, Japan

10/2007 to 9/2008. Clinical Nurse, Multi-Service Inpatient/Surgical Unit
35th Medical Group, Misawa Air Base, Japan

10/2005 to 10/2007. Nurse Manager, Airmen/Primary Care Clinic;
Infection Control Program Manager
75th Medical Group, Hill Air Force Base, Utah

10/2003 to 10/2005. Flight Nurse, Aeromedical Evacuation
18th Aeromedical Evacuation Squadron, Kadena Air Base, Japan

9/2000 to 10/2003. Clinical Nurse, Emergency Department
56th Medical Group, Luke Air Force Base, Arizona

Professional Courses

3/2007. USAF Nursing Service Management; Air University Course in-residence
Sheppard Air Force Base, Texas

3/2006. Epidemiology Prevention and Infection Control; Air University Course in-residence
Sheppard Air Force Base, Texas

8/2005. USAF Squadron Officer School; Air University Correspondence
Professional Military Education

4/2003. Medical Survival Evasion Resistance and Escape (SERE); Military Aircrew requirement
Brooks City-Base, Texas

3/2003. Flight Nurse Qualification Course; USAF School of Aerospace Medicine
Brooks City-Base, Texas

10/2002. Combat Casualty Care Course (C4); Defense Military Readiness Training Institute
Camp Bullis, Texas