

REDUCING ER OVERUSE THROUGH A PRIMARY CARE PROVIDER HEALTH  
LITERACY AWARENESS INITIATIVE

A Doctor of Nursing Practice Project Report

by

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Submitted in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF NURSING PRACTICE

Texas A&M University-Corpus Christi  
Corpus Christi, Texas

August 2021

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This Doctor of Nursing Practice Project Report meets the standards for scope and quality of Texas A&M University-Corpus Christi College of Nursing and Health Sciences and is hereby approved.

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## DEDICATION

I would like to dedicate this work to my husband, Charles. You have been by my side the entire time, encouraging me to always strive for more, and supporting our home so I could achieve this dream. To my daughter, Margaret, whose bright eyes, love, and smiles provided me all the encouragement I needed along the way. To my parents, for instilling in me the value of perseverance and passion.

## ACKNOWLEDGEMENTS

I would like to express my sincerest gratitude to my faculty chair, Dr. Benham-Hutchins. You are a treasured mentor. Consistently available, endlessly optimistic, and brilliant. Thank you for giving me the most special gift in life, your time. Time consists of the past, present, and future. As I look to the past, you were a strong foundation. As I stand in the present, I cannot think of getting to this moment without you. Lastly, as I gaze into the future, I strive to follow your example by supporting others the way you supported me.

To Dr. Theresa Garcia, thank you for your leadership, dedication, and commitment. I wholeheartedly thank you for challenging me to think bigger, and I attribute much of my success and professional growth to you.

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## ABSTRACT

**Background:** Health literacy (HL) is a significant indicator of patient health status. Research has shown that a substantial number of patients seeking care in the emergency room (ER) have limited HL. Primary care providers (PCPs) serve a pivotal role in improving patient health, but are often underprepared, unaware, and/or overestimate their ability to address patient HL.

**Purpose:** This quality initiative (QI) aimed to improve PCP knowledge about patient HL, self-perceived communication practices relating to HL, and reduce ER overutilization in a South

Texas clinic providing indigent care. **Methods:** This QI project was a cross-sectional study. A single group, pre- and post-test design was conducted to evaluate provider knowledge about patient HL and self-perceived communication practices before and after a provider in-service. A third focus was to reduce ER overutilization after provider education and patient enrollment into a population health program, measured by a paired *t*-test for the preceding 90 days compared to the post intervention rates at 90 days. The sample consisted of five PCPs and six patients

identified as ER overutilizers. **Results:** Provider knowledge about patient HL and provider self-perceived communication skills improved after an educational in-service. Patient participants

had a statistically significant reduction in ER use post provider education. **Conclusion:** Health

literacy training for PCPs improved provider knowledge and self-perceived communication practices, and reduced ER overutilization in this South Texas clinic. Research is needed to evaluate the long-term effects related to provider HL knowledge and communication practices.

# Reducing ER Overuse Through a Primary Care Provider Health Literacy Awareness Initiative

## INTRODUCTION

According to the U.S. Department of Education's most recent health literacy (HL) survey, approximately 52% of Americans aged 16 – 65, roughly 1 out of every 2 people, lack basic health literacy (2017). While there are four levels of patient HL which are below basic, basic, intermediate, and proficient, it is important to note, patient HL may vary across the lifespan because it is influenced by acute pain, mental and physical illness, and emotional status (U.S. Department of Education, 2021a; Hersh et al., 2015). Health literacy is measured by the level at which a person can effectively communicate, process, obtain, and understand health information to make appropriate health decisions (Centers for Disease Control and Prevention [CDC], 2019). It requires a person to have adequate reading, writing, oral communication, and numeracy skills to process, navigate, and participate in health decisions (Scott, 2019).

### **Background**

Patients with limited HL have increased rates of mortality, higher healthcare costs, and increased use of emergency room (ER) services (Griffey et al., 2015). Vernon et al. (2007) published a report using the 2003 National Assessment of Adult Literacy survey and analyzed the financial impact of low patient HL on healthcare costs. The researchers estimated low patient HL accounted for approximately \$106 billion to \$238 billion annually which would continue to climb if action was not taken (Vernon et al., 2007). Pham et al. (2017) studied ER overutilizers within three hospitals and found over 40% of the participants did not understand which symptoms signaled a need to seek prompt medical advice, and more than half, 56%, did not understand discharge instructions. These findings suggest an urgent need to address patient HL in healthcare.

Primary care providers (PCPs) serve a critical role in health maintenance and management; therefore, they must know about patients HL levels to optimize care delivery (Hersh et al., 2015). Both nursing and medical organizations recommend healthcare providers complete initial and on-going provider education about how to assess and manage their practice and skills to support patient literacy levels (American Medical Association, 2013; American Academy of Nurse Practitioners, 2019). The purpose of this quality initiative (QI) was to educate primary care providers about patient HL, improve provider self-perceived communication practices, and determine how this influences emergency room (ER) overutilization in a family health center located in South Texas.

## **Review of Literature**

Multiple studies have found providers are often unaware, underprepared, and/or overestimate their ability to address patient HL (Hersh et al., 2015; Tavakoly Sany et al., 2017; Güner & Ekmekci, 2019). In one study, researchers surveyed 184 physicians and 78 nurses and found approximately 38% of physicians and 18% of nurses first learned about patient HL through the survey, and over 90% reported they had never received formal training (Güner & Ekmekci, 2019). These published findings underscore the need to raise awareness and educate providers about patient literacy.

To improve provider knowledge, skills, and communication practices, educational interventions have varied from didactic to experiential, with most incorporating a combination approach (Coleman, 2011). Allenbaugh et al. (2019) utilized a combination approach consisting of didactic, video demonstration, group discussion, and role-play for 37 attending physicians, 76 resident physicians, and 85 bedside nurses. The intervention was brief, low-cost, and improved communication with a significant improvement in knowledge and attitudes towards practices

supportive of patient HL (Allenbaugh et al., 2019). Price-Haywood and colleagues (2014) conducted a randomized controlled trial (RCT) involving five clinics with 18 primary care providers and 168 patients with limited HL to evaluate physician communication behaviors and shared-decision making about colon cancer screening. The experimental group received patient HL training, the experimental group did not, and both groups received semi-annual chart audit results of screening rate performance and communication scores from standardized patients (Price-Haywood et al., 2014). At baseline, neither group had differences in communication (Price-Haywood et al., 2014). Post-intervention, the experimental group achieved statistically significant higher scores in general communication and shared decision making at six and 12 months ( $p < 0.05$ ) compared to the control group (Price-Haywood et al., 2014). In another RCT, providers assigned to a HL education intervention group demonstrated improved patient-provider communication and their patients had improved hypertensive control compared to the control group (Tavakoly Sany et al., 2017). In all studies, educating healthcare providers about patient HL improved provider communication and care quality and was low cost (Price-Haywood et al., 2014; Tavakoly Sany et al., 2017; Allenbaugh et al., 2019).

### **Description of the Problem**

This project was selected because the providers were not offered education about patient health literacy, and secondly, the clinic measured provider performance by patient ER utilization and provider communication. This QI was conducted in a South Texas family health center clinic providing care to low-income residents.

### ***ER Overutilization***

ER overutilization was defined as a patient visiting the ER three or more times in the preceding three months. Between August 2017 and July 2018, the organization's population

health team found ER visits were increasing monthly. After conducting a retrospective chart review, they found many of the visits were from the same group of patients and for non-emergent reasons. The team developed a program in 2019 to address this problem. When the population health team identified a patient as an ER overutilizer, they offered to enroll them in a population health intervention program. This program offered same-day appointments with a primary care provider (PCP) and no-wait appointments at the walk-in clinic. It required monthly PCP appointments and waived co-pays for appointments and medications. The program also provided a free 30-day bus pass and a \$25 monthly grocery gift card for completing PCP appointments, and for avoiding the ER for non-emergent visits.

In 2019, the facility's population health team enrolled 194 participants who had visited the ER a total of 1,504 times within 90 days. Post-program enrollment, the same group visited the ER a total of 271 times over 12 months. This change led to a 36% reduction in total ER visits for the entire indigent insurance program, saving the health plan over \$1 million. This QI is projected to save the organization up to \$70,000 annually.

### **Guiding Frameworks**

Lewin's Change Theory has been previously adopted and incorporated as a common theory in nursing research to support change (Wojciechowski et al., 2016). Kurt Lewin was a social psychologist known for his field theory of behavior (Britannica, 2021). Lewin theorized individuals and groups were influenced by constant restraining and driving forces, which both went against each other, created tension, resulting in equilibrium (Holmes, 2004). To facilitate change, organizations must challenge the status quo using a three-stage model (Wojciechowski et al., 2016). The three stages in his model are:

1. Unfreezing stage, problem awareness occurs which allowing individuals to let go of previous behavior patterns.
2. Change/moving stage, education and alternatives to present behavior are presented.
3. Refreezing, new skills are acquired, integrated, and accepted as the new equilibrium, making it difficult to go back to old ways (Wojciechowski et al., 2016).

In this QI, providers participated in an educational in-service and completed a pre- and post-education quiz and self-perceived communication survey about patient health literacy. The pre- and post-assessments served as a driving force for unfreezing and created an environment for change. Sustainability and refreezing will require ongoing inspection (Holmes, 2004).

The Plan-Do-Study-Act process was used as an overarching framework to support project development, implementation, and sustainability. PDSA is the cornerstone for most QI projects because it tests change on a small scale per cycle and routinely evaluates for relevance and barriers (The Deming Institute, 2021). The key concepts of the framework address: (a) project goals/purpose, (b) implementation, (c) outcome evaluation for failure/success, and (d) overall project evaluation for expansion/reformulation (The Deming Institute, 2021). PDSA guided this initiative by providing a systematic approach for QI development, evaluation of results, and provided a platform to evaluate long-term adoption/changes.

### **Purpose Statement and Project Aims**

The purpose of this initiative was to improve provider knowledge about limited patient HL, improve provider self-perceived communication strategies, and reduce ER overutilization. The clinical practice question guiding this project was: In physicians and nurse practitioners at a family health center in South Texas providing care to low-income residents, does participation in an educational in-service about patient health literacy improve provider knowledge and self-

perceived communication skills, and influence the total number of emergency room visits by ER overutilizers enrolled in a population health program 90 days post intervention?

### ***Aim One***

The goal of aim one was to improve primary care providers knowledge about patient health literacy after an educational in-service. To accomplish aim one, in February 2021, providers attended an educational in-service regarding patient HL. Participants completed a pre- and post-education Health Literacy Brief Assessment Quiz (HLBAQ) to evaluate provider knowledge about patient health literacy (AHRQ, 2015a). See Appendix A. The goal was to have an increase in quiz scores post-intervention.

### ***Aim Two***

The goal of aim two was to enhance the providers' self-perceived communication skills after an educational in-service. To accomplish aim two, in February 2021, providers were asked to complete a baseline Communication Self-Assessment Survey (CSA) reflecting upon a previous patient encounter (CSA) (AHRQ, 2015b). See Appendix B. Post-intervention, the providers were asked to complete a follow-up CSA after a single patient encounter within 30 days. The goal was to have an increase in CSA scores post- in-service.

### ***Aim Three***

The goal of aim three was to decrease ER utilization by patients enrolled in a population health program after provider education. To accomplish aim three, after providers completed the in-service, in March 2021, the population health team began to screen and enroll patients identified as ER overutilizers into the population health program. The goal was to see a reduction in ER utilization after provider education.

This project applied the American Association of Colleges of Nursing (AACN) Doctor of Nursing Practice (DNP) Essential VII, “clinical prevention and population health for improving the nation’s health” (2006). This QI project applied synthesized research about patient HL to develop an initial and ongoing educational program for healthcare providers about limited patient HL. Secondly, this intervention was designed to improve provider-patient communication and to improve patient autonomy and self-efficacy, and in turn, improve patient healthcare outcomes. After an exhaustive and extensive literature review, best practices from the AHRQ Health Literacy Universal Precautions Toolkit were adopted into practice which incorporates the National Organization of Nurse Practitioners Faculties (NONPF) core competency of Scientific Foundation (2017).

## METHODS

### **Project Design**

This QI initiative used a pre- and post-test design guided by Lewin’s Change Theory to improve provider knowledge about patient health literacy and the providers’ self-perceived communication skills in a primary care clinic serving patients from a lower socioeconomic background in South Texas. Changing practice behavior can be challenging in the clinic due to multiple daily demands such as currently changing to a new electronic health record, clinic productivity focus, change in practice to incorporate telephone and zoom visits, and high patient acuity. Despite these competing factors, this QI was well received because it was educational, sought to enhance existing knowledge and skills, and was aligned to reduce emergency room visits.

The potential barriers that could have impacted the success of this QI project included the Sars-Coronavirus-19 (COVID-19) pandemic, an unprecedented winter freeze in February 2021,

staff resistance to change, and participant fear about how the new skills would impact visit times. The providers were eager to learn about risk factors of ER overutilization and limited patient literacy. Risk factors for unsuccessful project implementation were mitigated by respecting provider autonomy by surveying the best time to provide education and offering supplemental role-play post-education for anyone interested. Unfortunately, prior to project implementation one healthcare provider unexpectedly passed away and one provider was unable to participate due to winter weather and scheduling. See Appendix C for the risk assessment.

### **Participants and Recruitment**

This project plan was reviewed by the Texas A&M University-Corpus Christi Research Compliance Office and received a determination of “Not Human Subjects Research” and permission to proceed as a Quality Improvement project. See Appendix D. A letter of support was provided by the Director of Clinic Operations agreeing to fully support the project. See Appendix E. To protect the privacy of patient participants, aggregated, and de-identified patient data was provided to the project director (PD) by the population health team. Survey responses by the healthcare provider participants were collected and files were securely maintained in a locked cabinet accessible only to the PD.

### ***Participants***

Provider participants were included if they (1) were either a nurse practitioner or physician, (2) provided primary care, and (3) worked within the South Texas family health center. Patient participants were included if (1) they were enrolled in the population health intervention program after providers completed training and (2) country insurance recipients and, (3) were identified as ER overutilizers by the population health team.

### **Intervention**

This project was designed to be a mandatory in-service to be held during the monthly provider meeting. Before the in-service, provider participants were asked to complete a baseline HLBAQ and an initial CSA. See Appendices A and B. The participants then watched a condensed video on patient HL published by the AMA (Wisconsin Literacy, 2010), followed by a PowerPoint presentation created by the AHRQ “Health Literacy: Hidden Barriers and Practical Strategies” (2015c). Following the PowerPoint, an open discussion was conducted using the HL video questions to facilitate discussion. See Appendix F. Post education, participants received literature on key communication strategies created by the AHRQ (AHRQ, 2015e). See Appendix G. After the in-service providers were asked to complete a post-education HLBAQ at the end of the training session, and to complete a second CSA within the next 30 days after a patient encounter. After providers completed training, the population health team started to enroll patients into the ER overutilization population health intervention program. See Appendix H for the complete timeline.

The project team consisted of a project director (PD), the director of clinic operations, nurse managers, and the population health team. The director of clinic operations approved the training to take place. Aside from being the project director (PD), I am a full-time employed family nurse practitioner practicing within the South Texas clinics. I hosted the educational in-service, collected the provider surveys, and interpreted the data findings. Lastly, I coordinated with the population health team to receive de-identified patient data for patients they enrolled into their population health intervention program for ER overutilizers after provider training.

### **Data Collection**

Baseline HLBAQ and CSA scores were manually obtained the day of the educational in-service via paper and pen before the in-service. Provider participants were asked to reflect on a

recent encounter to complete the baseline CSA. After the in-service, the providers immediately completed a follow-up HLBAQ. They were asked to complete an additional CSA after a patient encounter via paper printout within 30 days and return to me in person or by email. The population health team provided de-identified patient data including age, sex, race, and the number of ER visits for the preceding 90 days and for 90 days post- provider in-service. See Appendix H for the project timeline.

### **Measurement Tools**

The tools used in this QI were adopted from the AHRQ Health Literacy Universal Precautions Toolkit which are designed as best practice (AHRQ, 2020f). Both tools have been tested and developed based on multiple clinician's feedback and PDSA cycles (DeWalt et al., 2011). All instruments were created using a combination of existing tools and were tested in multiple diverse centers and populations (DeWalt et al., 2011). The multiple PDSA cycles allowed the developers to rapidly evaluate ease of use, cost basis, and adaptability in various practice locations (DeWalt et al., 2011). DeWalt et al. (2011) notes while the instruments are designed to help practices become accountable, there are limitations to examining whether the toolkit improves healthcare quality as studies have found slow penetration of a reliable process. Tool implementation holds a feasible promise at improving patient literacy in primary care practice, however, reliability of a standardized tool will take time (DeWalt et al., 2011).

#### ***Health Literacy Baseline Assessment Quiz Description***

The HLBAQ is a ten-question quiz consisting of multiple-choice, true/false, and an open-ended question about basic patient health literacy. The content covers red flags for limited patient literacy, average reading rates, common myths, and skills associated with HL. For question one through nine, one point was assigned, with the open-ended question not scored, for

a minimum score of zero and max score of 9. The higher scores on the HLBAQ is associated with an increased knowledge of basic patient HL.

### ***Communication Self-Assessment Tool Description***

The CSA tool is a 13-question self-assessment survey with one open-ended question. For questions 1 through 12, the participant scores each with a disagree, neutral, or agree response. The questions ask the respondent if they welcomed the patient, made good eye contact, listened without interruption, had slow speech pace, provided clear verbal instructions, and used supplemental material (AHRQ, 2015b). Additional questions cover avoidance of medical jargon, use of the teach back method, and if they asked the patient for questions and if they understood (AHRQ, 2015b). For scoring purposes, disagree was assigned a point value of zero, neutral one-point, and agree two-points, for a total possible score of 24. The open-ended question was excluded from scoring. The higher the score on the survey indicated higher self-perceived communication practices supportive of patient literacy.

### **Data Analysis**

Descriptive statistics using JASP 0.14.1 statistical software was used to analyze and report provider sample demographics including mean age with standard deviation, gender percentage, and range of years in practice along with the mean and standard deviation. The population health team provided deidentified patient demographics including age, gender, and ethnicity. Descriptive statistics were used to evaluate mean age, percentage and frequency of gender and ethnicity.

For both surveys, JASP statistical software 0.14.1 was used to calculate the mean and standard deviation of pre- and post-assessment scores. The data was further evaluated using paired *t*-tests comparing pre- and post-intervention survey mean scores for statistical significance.

Significance was established at  $p < .05$ , and Cohen's  $d$  was calculated to determine effect size for statistically significant findings. ER utilization was evaluated using descriptive statistics and a paired  $t$ -test to detect statistically significant differences between pre-intervention emergency room (ER) visit means compared to post-intervention ER visit means. Patient ER data was reported for the preceding 90 days before the educational intervention and then compared to post-intervention ER visits over 90 days using a run chart. See Appendix I for the complete data analysis.

## RESULTS

### **Implementation**

A total of six primary care providers met inclusion criteria and were invited to participate in the project. Out of the six invited, five agreed to participate. The sixth provider was unable to participate due to competing clinic demands and scheduled time off. Originally this intervention was planned to be mandatory training during the monthly provider meeting. However, due to the COVID-19 global pandemic and decreased patient volumes, provider meetings focused on clinic productivity and upcoming EHR adoption. To address this barrier, I met with the participating providers voluntarily at each clinic during their lunch break to complete the provider education. After provider training was completed, the population health team collected deidentified patient data for ER overutilizers who were enrolled into their intervention program post provider education in March 2021. According to the population health team, a total of 21 patients met the inclusion criteria for the program. Out of the 21 eligible patients, six patients consented to their program, six declined, and the remaining nine either did not answer the phone call, respond to voicemail messages, or had non-working telephone numbers. Patients recruited into the population health program met with an RN case manager to develop an individualized care plan,

and to clarify reasons for ER use compared to urgent care and same-day appointments with their primary care provider. The population health team checked in weekly with the patients, within 24 hours after an ER visit, and as needed between check-ins at the patient's request. The population health team did not experience any barriers in contacting the patients.

## Outcomes

### *Demographics*

Provider participants were all women ( $n = 5$ , 100%) with a mean age of 51.6 years ( $SD=8.5$ ). They were predominantly Hispanic ( $n = 3$ , 60%), with others identifying as White, not Hispanic ( $n = 1$ , 20%), and other ( $n = 1$ , 20%). There were four APRNs ( $n = 4$ , 80%) and one physician ( $n = 1$ , 20%). Provider years in practice ranged from 5 to 17 years in practice, with a mean of 9.8 years ( $SD = 5.1$ ). This data is summarized in Table 1. Patient participants were identified as men ( $n = 3$ , 50%) and women ( $n = 3$ , 50%) who were predominantly Hispanic ( $n = 5$ , 80%), with the other identifying as African American ( $n = 1$ , 20%). This data is summarized in Table 2.

Table 1: Primary Care Provider Demographics

Characteristics	N (%)
<b>Gender</b>	
Female	5 (100%)
Male	0 (0%)
<b>Age</b>	
Mean	51.6 years, ( $SD=8.5$ )
<b>Ethnicity, self-identified</b>	
White	1 (20%)
Hispanic	3 (60%)
Other	1 (20%)
<b>Provider Type</b>	
Physician	1 (20%)
APRN	4 (80%)

Years in Practice	
Mean	9.8 years, (SD=5.1)
Minimum	5 years
Maximum	17 years

Table 2: Patient Demographics

Characteristics	N (%)
<b>Gender</b>	
Female	3 (50%)
Male	3 (50%)
<b>Age</b>	
Mean	42.7 (SD=9.2)
<b>Ethnicity, self-identified</b>	
Black	1(20%)
Hispanic	5(80%)

### Findings by Specific Aim

To determine if aim one was met, descriptive statistics along with a paired *t*-test were conducted to detect statistically significant differences between pre- and post-intervention HLBAQ mean test scores. Post-intervention HLBAQ scores ( $M = 7$ ,  $SD = 1.4$ ;  $t(4) = -3.7$ ,  $p = .02$ ,  $d = -1.6$ ) were significantly higher than pre-intervention HLBAQ scores ( $M = 5.2$ ,  $SD = 1.5$ ).

To determine if aim two was met, descriptive statistics along with a paired *t*-test were conducted to detect statistically significant differences between pre- and post-intervention CSA mean scores. Post-intervention CSA mean scores ( $M = 23.2$ ,  $SD = 1.3$ ;  $t(4) = -4$ ,  $p = 0.02$ ,  $d = -1.8$ ) were significantly higher than pre-intervention CSA mean scores ( $M = 20$ ,  $SD = 1.9$ ).

A thematic analysis of open-ended question responses was conducted looking for common themes across responses on both the HLBAQ and CSA optional open-ended question. At the end of the HLBAQ providers were asked “What strategies could all of us adopt to

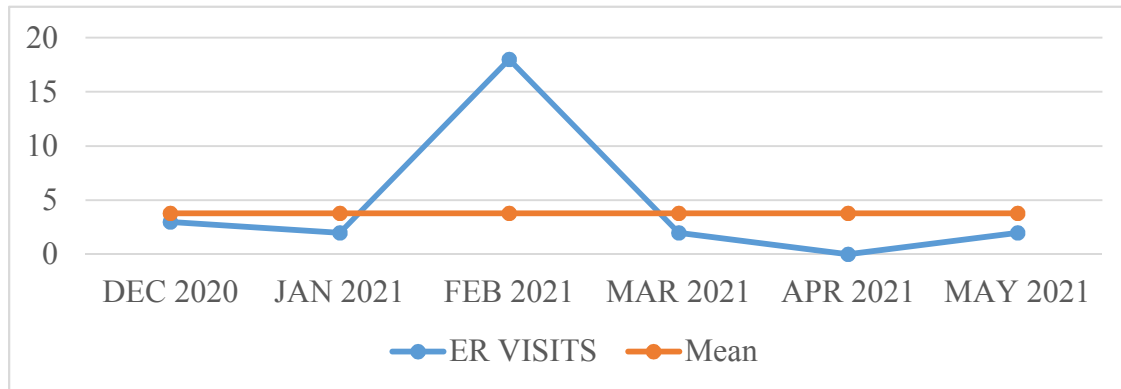
minimize barriers and misunderstandings for patients”. At the end of the CSA providers were asked “What areas can you improve on?” and “What strategies can you use to improve them?” (AHRQ, 2015a; AHRQ, 2015b). Providers left multiple comments about how to improve their communication such as “slow down”, “use more pictures”, use “teach back”, and “check for understanding”.

To determine if aim three was met, descriptive statistics and a paired *t*-test was conducted to detect statistically significant differences between the number of pre-intervention ER visits compared to post-intervention ER visits. Post-intervention ER visits ( $M = 0.7$ ,  $SD = .5$ ;  $t(5) = 7.9$ ,  $p < .001$ ,  $d = 3.2$ ) were significantly lower than pre-intervention ER visits ( $M = 3.8$ ,  $SD = 0.8$ ). All result findings are displayed in Table 3. ER visits with changes over time are demonstrated on a run chart in Figure 1. The six participants remained in the program during this study, and none were lost to follow-up.

Table 3: Results of Pre- and Post-test HLBAQ, CSA, and Emergency Room Data

Variable	Mean (SD)	<i>t</i> (df)	<i>p</i>	Cohen’s <i>d</i>
<b>HLBAQ</b>				
Pre-intervention	5.2 (SD = 1.5)			
Post-intervention	7 (SD = 1.4)			
		$t(4) = -3.7$	.02	-1.6
<b>CSA</b>				
Pre-intervention	20 (SD = 1.9)			
Post-intervention	23.2 (SD = 1.3)			
		$t(4) = -4$	.02	-1.8
<b>ER Visits</b>				
Pre-intervention 90 days	3.8 (SD = .8)			
Post-intervention 90 days	0.7 (SD = .5)			
		$t(5) = 7.9$	< .001	3.2

Figure 1: Patient Emergency Room Trends



## DISCUSSION

The purpose of this QI was to improve provider knowledge about patient health literacy, improve provider communication skills relating to patient health literacy, and to reduce emergency room visits by ER overutilizers. Aim one measured baseline provider knowledge about patient health literacy using the HLBAQ survey with a goal to increase provider knowledge about patient HL evident by an increase in post-test scores. Post-intervention there was an increase in HLBAQ scores suggestive of increased provider knowledge. The goal of aim two was to improve the provider's self-perceived ability to communicate using strategies sensitive to patient HL post in-service. Comparing pre- and post-intervention CSA scores, providers scored higher post-intervention achieving this goal. Lastly, aim three targeted a reduction in ER visits in patients identified as ER overutilizers. Prior to program enrollment and provider education, the participants visited the ER 23 times in the preceding 90 days, an average of 3.8 times per person. Post-intervention, there were only two visits from the entire group, an average of 0.33 visits per person. This intervention was successful in reducing ER visits which has the potential to reduce overall organizational healthcare costs.

Pre-intervention providers' comments to the question "what strategies could all of us adopt to minimize barriers and misunderstanding for patients?" on the HLBAQ were analyzed. Common themes emerged from provider comments such as the importance of checking for patient comprehension during the visit, use of the teach back method, slowing speech pace, examining personal biases, and using appropriate language and pictures. This aligned with Coleman et al. (2017) findings which sought to understand and prioritize recommended HL communication practices from health literacy experts. The researchers found HL experts ranked avoiding medical jargon in oral and written communication, routine use of the teach back method to evaluate patient comprehension and correct misunderstandings, and eliciting patient feedback using open-ended questions such as "what questions do you have" as the top three best practices (Coleman et al., 2017). While none of the participants in this study are HL experts, provider comments were reflective of best practices described by Coleman et al. (2017).

The increase in post-intervention HLBAQ and CSA results were similar to the findings of Coleman and Fromer (2015) who studied the effects of a 3.5-hour health literacy program on provider knowledge, intended behaviors, and perceived skill. Post-intervention, providers had an increase in knowledge about patient health literacy and were more likely to use communication skills sensitive to patient literacy (Coleman & Fromer, 2015). The studies differ because Coleman and Fromer (2015) analyzed results further and found improvement varied between non-physician and physician providers, and years of experience. This aspect was not explored in this study due to the overall small sample size and limited physician compared to non-physician providers variation.

Lastly, in a systematic review of literature about emergency room outcomes and patient health literacy, researchers found a substantial proportion of patients seeking care in the ER had

limited literacy (Herndon et al., 2011). Bauer et al. (2016) sought to evaluate the extent to which patient HL was associated with patient perceived access to, and the quality of care perceived with their primary care provider, in patients seeking care in the ER. In both the adjusted and non-adjusted analyses, patients with limited HL were significantly less likely to report their doctor carefully listened, gave clear instructions on how to manage health problems or symptoms, and were less likely to confide personal details to them compared to patients with adequate literacy (Bauer et al., 2016). Bauer et al. (2016) concluded while the reason for seeking care in the ER was not completely clear, evidence suggests patients with limited HL perceived difficulties accessing primary care, were less likely to participate in shared decision making during primary care visits, and primary care providers did not always assess patient comprehension about health management. Similar to Bauer et al. (2016), it is unclear which aspect of the QI project contributed most towards the reduction in ER visits.

The clinic has slowly started to incorporate more practices supportive of patient health literacy. Recently, the clinic provided a handout which emphasizes skills taught within the educational in-service such as allow the patient to speak uninterrupted, sit at eye-level, use teach-back, and use of pictures. Secondly, with a clinically significant reduction in ER use by ER overutilizers, the clinic will continue to work closely with the population health team to continue their intervention program. In future PDSA cycles, it may be beneficial to add a qualitative component to the QI such as interviewing patients about provider communication techniques and patient perceived benefit.

### **Limitations**

This QI had several noted limitations. First, the sample size was small for both patient and provider participants. While provider participation was voluntary, the sample consisted of

all female participants and one physician. Small sample size along with limited variation in provider type and gender may limit result generalizability to similar settings. The reduction of ER visits could have been influenced by the population health program which offered several patient benefits. In future studies it will be important to increase sample sizes for participating providers, diversify the sample, and collect the data for longer periods of time.

### **Interpretation**

Through use of the PDSA model and Lewin's Change Theory, this QI was successful. The PDSA created an algorithmic process which allowed translation of evidence-based guidelines from a systematic review of literature into clinical practice (plan phase), followed by project implementation (do phase), to evaluation of results (study phase), and finally activation of findings into project expansion or changes for additional cycles (act phase) (The Deming Institute, 2021). Keeping in-line with Lewin's Change Theory, unfreezing occurred when the providers were given the opportunity to take a baseline knowledge exam on patient health literacy and a communication self-assessment survey (Holmes, 2004; Wojciechowski et al., 2016). This action brought awareness to the providers' knowledge about deficits which challenged their equilibrium. The deficit bore a driving force, which facilitated a transition into movement, evident in higher post-assessment scores and ER reduction. In this short time span, it is difficult to ascertain whether behavior has transitioned into long-term practice adoption known as freezing (Holmes, 2004; Wojciechowski et al., 2016). To evaluate this last step, it is recommended the clinic follow-up using patient satisfaction scores relating to provider communication and sustenance of ER visit reduction over time. Considering the success of the first phase, it is recommended to expand education to the entire clinic staff.

### **Conclusion**

Patient health literacy is one of the strongest predictors of patient health status, more than any other factor including education level, employment status, race, ethnicity, and income (Güner & Ekmekci, 2019). Health literacy as a predictor of patient health status may be due to patients with limited literacy using less preventative health services, having higher rates of chronic conditions and comorbidities, and being less efficacious in health self-management (Balakrishnan et al., 2017). The AHRQ asserts the quality of patient care can be improved by patients seeking care in outpatient settings and using preventative health services compared to frequent visits in the ER (2018g). As previously discussed, more research is needed to evaluate why patients choose to seek care in the emergency room versus primary care in this setting, and whether training is an effective long-term solution for ER reduction and provider use of skills.

This QI project demonstrated clinic programs such as the population health program and provider education are associated with decreased emergency room visits. These QI results add to existing research findings on the impact of provider education on patient HL and communication. Education has been shown to impact patient outcomes such as increased use of preventative health services, chronic condition management, decreased ER visit use, and shared decision making, all which have the potential to decrease overall healthcare costs and increase the quality of patient care (Balakrishnan et al., 2017; Bauer et al., 2018; Price-Haywood et al., 2014; Tavakoly et al., 2018; Yin et al., 2016).

The Institute of Healthcare Improvement has long advocated for healthcare organizations to adopt clinical practices to improve quality care (Feeley, 2017). Improving patient care has the potential to decrease healthcare costs and improve patient satisfaction in health management (Feeley, 2017). Considering this QI was low-cost and effective, the current organization should consider long-term adoption through extension of education to all staff.

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## APPENDIX A: Health Literacy Brief Assessment Quiz (HLBAQ)

We would like to get a sense of the knowledge and understanding you have about health literacy. Please complete this brief quiz that assesses some key facts about health literacy.

1. Limited health literacy is associated with:
  - ☐ A. Higher mortality rates
  - ☐ B. Lower levels of health knowledge
  - ☐ C. Greater use of inpatient and emergency department care
  - ☐ D. Poor medicine adherence
  - ☐ E. B and D
  - ☐ F. All of the above
2. You can tell how health literate a person is by knowing what grade he or she completed in school.
  - ☐ A. True
  - ☐ B. False
3. Which of the following skills are considered to be components of health literacy?
  - ☐ A. Ability to understand and use numbers
  - ☐ B. Reading skills
  - ☐ C. Speaking skills
  - ☐ D. Ability to understand what is said
  - ☐ E. Writing skills
  - ☐ F. All the above

4. Being anxious affects a person's ability to absorb, recall, and use health information effectively.
- ☐ A. True
  - ☐ B. False
5. What is the average reading level of U.S. adults?
- ☐ A. 4<sup>th</sup>-5<sup>th</sup> grade
  - ☐ B. 6<sup>th</sup>-7<sup>th</sup> grade
  - ☐ C. 8<sup>th</sup>-9<sup>th</sup> grade
  - ☐ D. 10<sup>th</sup>-11<sup>th</sup> grade
  - ☐ E. 12<sup>th</sup> grade
6. What is the grade level at which health-related information (like a diabetes brochure) is typically written?
- ☐ A. 4<sup>th</sup>-5<sup>th</sup> grade
  - ☐ B. 6<sup>th</sup>-7<sup>th</sup> grade
  - ☐ C. 8<sup>th</sup>-9<sup>th</sup> grade
  - ☐ D. 10<sup>th</sup> grade or higher
  - ☐ E. 11<sup>th</sup> grade or higher
  - ☐ F. 12<sup>th</sup> grade or higher
  - ☐ G. college level

7. What is the best reading level for written materials used with patients?

- ☐ A. 3<sup>rd</sup>-4<sup>th</sup> grade
- ☐ B. 5<sup>th</sup>-6<sup>th</sup> grade
- ☐ C. 7<sup>th</sup>-8<sup>th</sup> grade
- ☐ D. 9<sup>th</sup>-10<sup>th</sup> grade
- ☐ E. 11<sup>th</sup>-12<sup>th</sup> grade

8. To use good health literacy practices, staff and clinicians should use which of the following words/phrases when talking to or writing instructions for a patient or family member?

Circle the word/phase in either Option 1 or 2 in each row			
Option 1		OR	Option 2
a.	Bad	OR	Adverse
b.	Hypertension	OR	High Blood Pressure
c.	Blood Glucose	OR	Blood Sugar
d.	You have the flu.	OR	Your flu test was positive.
e.	The cardiologist is Dr. Brown.	OR	The heart doctor is Dr. Brown.
f.	Your appointment is at 11:00 AM. Check in 20 minutes early.	OR	Arrive at 10:40 AM to check in.

9. It is a good health literacy practice to assume that each patient you communicate with has limited health literacy.

☐ A. True

☐ B. False

10. What strategies could all of us adopt to minimize barriers and misunderstanding for patients?

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(Agency for Healthcare Research and Quality [AHRQ], 2015a)

## APPENDIX B: Communication Self-Assessment (CSA)

**Directions:** After a patient encounter, rate your level of agreement to the statements in the table. Your self-assessment is subjective, but it allows you to examine your oral communication with patients honestly. After completing the assessment, think about how you could improve.

	Disagree	Neutral	Agree
I greeted the patient with a kind, welcoming attitude.			
I maintained appropriate eye contact while speaking with the patient.			
I listened without interrupting			
I encouraged the patient to voice his or her concerns throughout the visit.			
I spoke clearly and at a moderate pace.			
I used non-medical language.			
I limited the discussion to fewer than 5 key points or topics.			
I gave specific, concrete explanations and instructions.			
I repeated key points.			
I used graphics such as a picture, diagram, or model to help explain something to my patient (if applicable).			
I asked the patient what questions he or she had.			
I checked that the patient understood the information I gave him or her.			

What areas can you improve on? What strategies can you use to improve them?

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(Agency for Healthcare Research and Quality [AHRQ], 2015b)

## APPENDIX C: Risk Assessment

Force Field Analysis			
	Forces		
Countermeasures Proposed Solutions	Driving Forces (For)	Restraining Forces (Against)	Action to Be Taken
Value provider autonomy: Offer role-play exercise after training	Evidence based and supportive of improved patient-provider relationship	Fear of increased time used per visit	Incorporate video with demonstration of health literacy principles
Eventually transition from in-person training to strictly online training.	Low-Cost Intervention	Will require on-going training/competes with other educational offerings/COVID 19 may make face to face unattainable.	If social distancing still in place, can transition to Zoom meeting; Recommend for conversion to an on-line only offering and have it required annually
Involve leadership of clinic to endorse/reinforce the skills in practice	Education topic is endorsed by AMA and AANP	Provider has old Values/Set in Way	In future PDSA cycles investigate rationale for lack of change.

APPENDIX D: Texas A&M University Corpus Christi IRB Determination Letter with

Amendment

**From:** [irb@tamucc.edu](mailto:irb@tamucc.edu) <[donotreply@redcap.tamucc.edu](mailto:donotreply@redcap.tamucc.edu)>

**Sent:** Friday, November 13, 2020 9:09 AM

**To:** Miller, Emily

**Cc:** IRB <[irb@tamucc.edu](mailto:irb@tamucc.edu)>

**Subject:** Not Human Subjects Determination: Not Research

Dear Dr. Marge Benham-Hutchins Emily Miller MSN APRN FNP-C,  
Activities meeting the DHHS definition of research or the FDA definition of clinical investigation and involves human subjects are subject to IRB review and approval. On 11-13-2020, the Office of Research Compliance reviewed the project below and determined that the proposed activity does not meet the FDA definition of a clinical investigation or DHHS definition of research:

Type of Review:	Not Human Subjects Determination
IRB ID:	TAMU-CC-IRB-2020-11-07
Project Lead:	Dr. Marge Benham-Hutchins Emily Miller MSN APRN FNP-C
Title:	A Quality Initiative to Increase Provider Health Literacy Awareness for Clinicians Serving a Low-Income Outpatient Setting
Rationale:	The project will not develop or contribute generalizable knowledge

Therefore, this project does not require IRB review. You may proceed with this project.

Limits to this determination:

1. This determination applies only to the activities described in the documents reviewed. Any planned changes require submission to the IRB to ensure that the research continues to meet criteria for a non-human subject research determination.
2. This project may NOT be referenced as "IRBapproved".

The following statement can be included in the manuscript: "This Project was reviewed and determined to not meet the criteria for human subjects research by the Texas A&M University-Corpus Christi Institutional Review Board."

Please do not hesitate to contact the Office of Research Compliance with any questions.

Respectfully,

Germaine Hughes-Waters

Office of Research Compliance

Office of Research Compliance

**From:** irb@tamucc.edu <donotreply@redcap.tamucc.edu>

**Sent:** Friday, December 18, 2020 8:00 AM

**To:** Benham-Hutchins, Marge

**Cc:** IRB <irb@tamucc.edu>

**Subject:** Amendment Approval

Dear Marge Benham-Hutchins,

The Texas A&M University-Corpus Christi IRB reviewed the following submission:

Type of Review:	Amendment
IRB #:	TAMU-CC-IRB-2020-11-07
Investigator Name:	Marge Benham-Hutchins
Study Title:	Reducing Emergency Room Utilization by Patients Enrolled in the Select Wellness Program through Patient Health Literacy Training for Primary Care Providers
Amendment Name:	Updated Title of Quality Initiative
Type of Change:	Other Changes
Description of Change:	Updated title of project to: Reducing Emergency Room Utilization by Patients Enrolled in the Select Wellness Program through Patient Health Literacy Training for Primary Care Providers
Revised Documents Approved:	Miller_E QI_Protocol_Amendment1
Amendment Submission Date:	12-08-2020
Amendment Approval Date:	12-18-2020

Please do not hesitate to contact the Office of Research Compliance with any questions at [irb@tamucc.edu](mailto:irb@tamucc.edu).

Respectfully,

Germaine Hughes-Waters

Office of Research Compliance

## APPENDIX E: Facility Letter of Support

OUR MISSION "To Extend the Healing Ministry of Jesus Christ"



08/06/2020

Dr. Sara Baldwin  
Associate Dean for Academic Programs  
College of Nursing and Health Sciences  
Texas A&M University – Corpus Christi  
6300 Ocean Drive  
Corpus Christi, TX 78412

Dear Dr. Baldwin,

The purpose of this letter is to provide Emily Miller, a Doctor of Nursing Practice student at Texas A&M University College of Nursing and Health Sciences, support in conducting a quality improvement project at the Christus Family Health Centers. The project, Health Literacy and Provider Knowledge, entails evaluating nurse practitioner and physician knowledge via a pre and post survey on health literacy strategies after an in-service.

The purpose of this project is to evaluate baseline provider knowledge on health literacy principles and improve their skills post in-service. Christus Family Health Centers was selected for this project because the centers provide care to high-risk patients that are susceptible to health disparities secondary to low health literacy. Emily Miller is a nurse practitioner within this setting and has a strong interest in improving care for this population.

I, Humberto Ramos, Director of Clinic Operations at the Christus Family Health Centers do hereby fully support Emily Miller in the conduct of this quality improvement project, Health Literacy and Provider Knowledge at the Christus Family Health Centers.

Sincerely,

A handwritten signature in black ink, appearing to read "Humberto Ramos", is written over a horizontal line.

*Humberto Ramos, MPH, Director, Clinic Operations*

2606 Hospital Boulevard | Corpus Christi | TX 78405  
Tel 361.902.0900 | Fax 361.902.0905

## APPENDIX F: Health Literacy Video Questions for Discussion

1. Now that you realize "you can't tell someone's health literacy status just by looking," what are some things that you have noticed that would suggest your patients may have a difficult time understanding?
2. Consider the patients featured in this video. What surprised you about their attitudes, concerns, or questions?
3. What have you learned that you will use to improve your communication with patients?
4. What is the most important thing that your practice needs to change to promote better communication?
5. What ideas do you have for changes that would improve your patients' understanding?

(Agency for Healthcare Research and Quality [AHRQ], 2015d)

## APPENDIX G: Key Communication Strategies

- **Warm Greeting**
- **Eye Contact**
- **Listen**
- **Use Plain, Non-Medical Language**
- **Slow Down**
- **Limit Content**
- **Show How It's Done**
- **Use Teach-Back**
- **Repeat Key Points**
- **Use Graphics**
- **Invite Patient Participation**
- **Encourage Questions**

(Agency for Healthcare Research and Quality [AHRQ], 2015e)

## APPENDIX H: DNP Timeline

Task Name	Start Date	End Date
Begin Project	09/01/20	6/30/21
Compile PowerPoint, video, handouts	09/01/20	11/20/20
Present final proposal to TAMUCC for approval	11/15/20	12/30/20
Complete TAMUCC IRB Process	11/01/20	12/15/20
Administer Baseline HLBAQ / CSA	1/1/21	1/31/21
Train providers on health literacy and strategies	1/1/21	1/31/21
Repeat HLBAQ post in-service	1/1/21	2/14/21
Follow up CSA within 30 days post in-service	2/1/21	2/28/21
Post Intervention	2/1/21	2/28/21
Request Population Health Management Team to start collecting aggregate data on population health program patients enrolled for 30 days	3/1/21	3/31/21
Collect Aggregate data for patients enrolled in March: preceding 90-day ER trends, and then following enrollment for 90 days	3/1/21	5/31/21
Analysis	6/01/21	6/30/21
Translate scores into statistics	3/1/21	4/15/21
Analyze findings	6/1/21	6/30/21
Debrief	5/30/21	6/30/21
Share findings with Organization	7/1/21	7/30/21

# APPENDIX I: Data Analysis

Project Aim	Variable	Data Collected	Report	Analysis Tool
Aim #1: Improve provider knowledge about patient health literacy	Baseline Health Literacy Assessment Quiz mean score (score 0 – 10): continuous (scale/interval/ratio)	Pre-test total scores  Post-test total scores	HLBAQ pre-test mean score  Compared to  Post-test mean score	Paired student <i>t</i> -test to look for statistical significance
Aim #2: Improve provider communication skills to address patient literacy	CSA mean score (score 0 – 24) Disagree = 0 pts Neutral = 1 pts Agree = 2 pts continuous (scale/interval/ratio)	Pre-test total scores  Post-education CSA scores	CSA pre-test mean score  Compared to  Post-intervention CSA mean score	Paired provider <i>t</i> -test to look for statistical significance
Aim #3: Reduce ER visits in the population health program group	Total ER visits before population health program enrollment and provider intervention - Continuous - (scale/interval/ratio)	ER visits in preceding three months prior to education -Aggregate data on patients enrolled post intervention -Aggregate ER visits in 90 days pre-intervention  -Aggregate ER visits for enrolled patients post intervention at 30, 60 and 90 days	Total ER visits in preceding 90 days from participants before intervention  Compare against post-intervention ER visits at 30, 60, and 90 days.	Paired <i>t</i> -test to look for statistical significance  Run chart