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Impact of a Comprehensive Clinician Educational Program on Health Literacy and Patient Satisfaction

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Abstract

BACKGROUND: The Institute of Medicine has defined health literacy as "the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions". Health literacy is a significant social determinant of overall health and can be particularly challenging in the critical care environment. According to the U.S. Department of Health and Human Services, only 12% of adults have proficient health literacy, 53% have intermediate health literacy, 21% have basic health literacy ability, and 14% have below basic health literacy (AHQR.gov, 2008).

METHODS: A pre- and post-intervention survey of satisfaction with clinician communication and assessment of patient or surrogate health literacy was conducted on 67 unique patients or surrogates to evaluate the effectiveness of a single 2-week online educational program on health literacy and comprehensive communication strategies. A total of 87 clinicians at all levels completed the educational intervention including a pre- and post-intervention assessment tool and survey to assess effectiveness.

INTERVENTIONS: A questionnaire modeled after the REALM-SF and AHRQ Health Literacy Survey was used to evaluate 67 patients on their experience and satisfaction with clinician communication. Eighty-seven clinicians completed the educational intervention, which included assessment of baseline understanding of health literacy.

RESULTS: Among all patients and surrogates surveyed pre- and post-intervention there was no significant difference in level of health literacy ($p > 0.95$). However, there was statistical evidence the intervention positively impacted patient satisfaction with clinician communication (p-0.041).

CONCLUSION: A strong relationship between patient satisfaction and health literacy was demonstrated. Educating clinicians on communication techniques can positively impact patient

satisfaction. The literacy screening tool may prove useful in identifying a subset of the patient

population who would benefit from enhanced communication techniques and focused health

literacy interventions to bridge the gap of those most at risk for poor outcomes and increase

patient satisfaction.

Keywords: health literacy, communication, patient satisfaction, REALM-SF, low health

literacy, AHRQ Health Literacy Survey

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Introduction

Problem Description

Health literacy is defined as "the ability to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (MacLeod et al., 2017, p. 334) and has been recognized as a global health care issue. In the United States 88% of adults struggle with routine self- and family-care health management (Loan et al., 2018). Health literacy is a significant social determinant of overall health and can be particularly challenging in the critical care environment. According to the United States Department of Health and Human Services only 12% of adults have proficient health literacy, 53% have intermediate health literacy, 21% have basic health literacy ability, and 14% have below basic health literacy (AHQR.gov, 2008). Bridging the gap between academics, clinicians, and those writing and implementing policy is key to ensuring health literacy is not reserved for higher cognitive functioning individuals, whether clinicians or patients (Kaper et al., 2018). Instead, it is imperative the focus is on those most at risk and expanding their health information knowledge through effective communication to drive advancement of the ability to impact patients' health literacy at all levels of cognitive ability.

Both the global and local situation surrounding health literacy and satisfaction with clinician communication is multifaceted. The demographics surrounding our community hospital are changing and there is an increasing number of patients where English is not the primary language. This demographic change coupled with Epic Systems Corporation MyChart Bedside (Epic Systems Corporation, n.d.) during hospitalization, severely curtailed family presence at the

bedside during the COVID 19 pandemic, and patient access to clinical notes mandated in the

21st Century Cures Act (PatientEngagementHIT, 2020) that went into effect on November 2,

2020, necessitated processes be put in place to identify and address health literacy issues.

Ensuring appropriate utilization of all available resources by patients and their families will help

optimize care and outcomes, creating an environment where patient-centered communication

serves to improve engagement in the healthcare process through greater understanding of health

information while providing support regardless of health literacy level.

Available Knowledge

It has long been recognized that ideal health outcomes and satisfaction, whether

individually or for population health overall, cannot be achieved without optimized health

literacy for every patient at each encounter, though the link and causal pathway between the two

are not clearly defined or understood (Wolf et al., 2009; Loan et al., 2018). The ability of

clinicians to adequately recognize patients' health literacy level and tailor their communication

techniques is imperative to overcome medical errors that result from nonadherence due to poor

clinician communication (Yim, Shumate, Barnett, & Leitman, 2018).

Health literacy is impacted by the following factors:

1. Processing speed, attention, working and long-term memory, and reasoning

2. Numeracy, verbal ability, and reading

3. Self-efficacy, communication, and prior experience

It is understood that recognition of these factors and effectively utilizing strategies and

interventions to encode health messages within an individual with the intention of increasing

self-awareness and health knowledge will potentially lead to personal action and a change of

health behavior and ultimately improved health outcomes, reduction in readmissions, and decreased healthcare costs (Wolf et al., 2009).

Bell et al. (2016) conducted a randomized-controlled trial that demonstrated no significant impact on 30-day hospital readmissions or emergency department (ED) visits for previously hospitalized patients overall in either the control or intervention arm, where intervention participants received tailored counseling and education utilizing individualized health literacy aids. In those assessed to have low health literacy tailored communication techniques and health literacy aids were shown to be more effective. All organizations recognize the importance of individualized discussion throughout hospitalization, and tailored education and planning upon discharge, but far too often fail to recognize the importance of addressing health literacy and the impact it can have on outcomes across the continuum of care. Many organizations have put measures in place to mitigate the lack of communication ability and measures such as language lines or language specific handouts and materials but fail to incorporate the true nature of health literacy across all socioeconomic levels.

An earlier study evaluated the efficacy of a heart failure self-management program designed for patients with low literacy versus usual care where the Short Test of Functional Health Literacy in Adults (S-TOFHLA) assessment tool was used to identify participant's level of health literacy (DeWalt et al., 2006). Specifically examining self-management in those identified with low health literacy uncovered the fact that improving communication by providers and designing a program tailored to a highly vulnerable patient population effectively reduced hospital readmissions for heart failure and reduced mortality.

Research from the University of Alabama at Birmingham Hospital has shown surgical infections have a greater likelihood of occurring in those patients with demonstrated low health

literacy levels (Heath, 2020). This is highly relevant in the critical care environment, an environment that includes a complex and vulnerable population at increased risk for poor outcomes because of ineffective or inadequate communication, especially as social distancing and limited patient/family visitation remain in place. Utilizing a quality improvement framework and incorporating strategies to enhance clinician patient communication is critical to achieving quality measures, improving morbidity and mortality rates, decreasing readmission rates, and improving overall patient satisfaction.

One area of further consideration emerged from a study evaluating the impact of inadequate health literacy on patient satisfaction, healthcare utilization, and expenditures among older adults (MacLeod et al., 2017). According to the Federal Interagency Forum on Aging-Related Statistics of 2008 as cited in MacLeod et al. (2017), adults aged 65 and older will account for 20% of the population by 2030 a number which is expected to reach 22% by 2050 (Statista Research Department, 2021) (Figure 1). Only 6% of these older individuals are projected to have proficient health literacy (AHRQ.gov, 2008), a factor having strong predictive correlation with suboptimal outcomes, increased disability related to poorer health and fitness, and reduced quality of life. Memory and cognitive changes older adults potentially face can create potential challenges that further limit health literacy necessitating design of effective strategies to address clinician understanding of their own limitations in addressing health literacy in older adults (Chesser, Woods, Smothers, & Rogers, 2015).

Figure 1

Share of Old Age Population (65 years and older) from 1950 to 2050
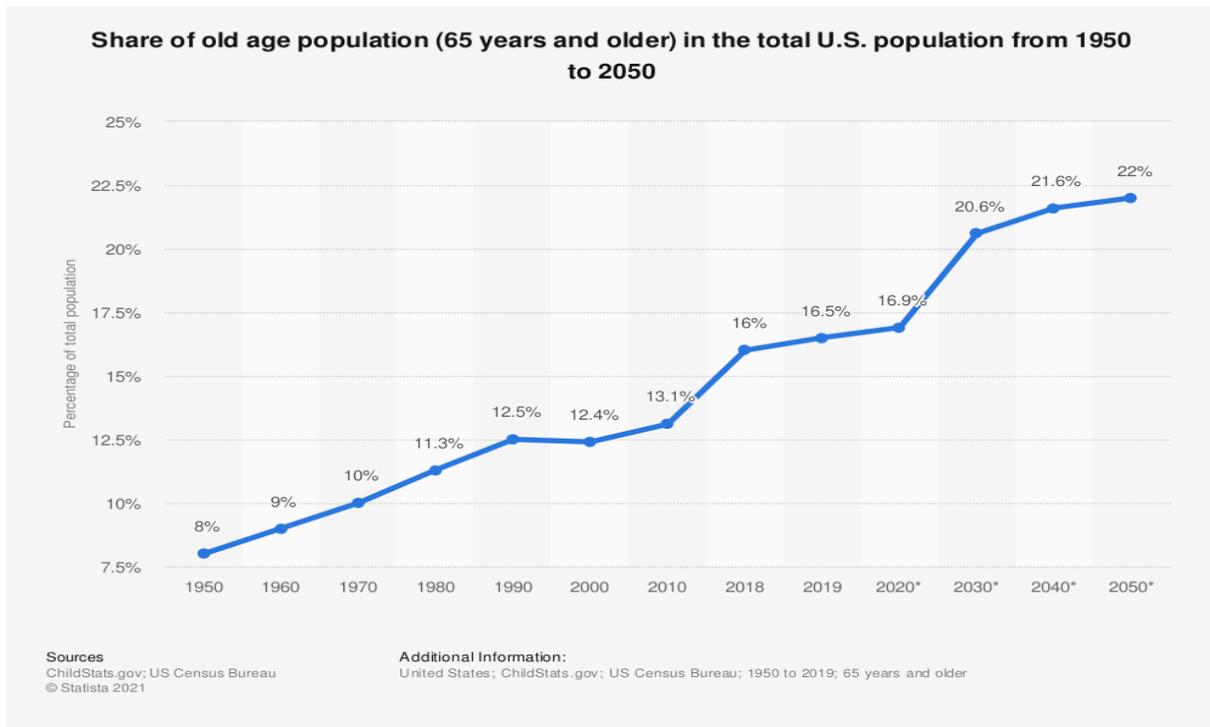
Statista 2021

Rationale

Health literacy is recognized as a global health care issue, and in the United States 88% of adults struggle with routine self- and family-care health management (Loan et al., 2018). Health literacy is a significant social determinant of overall health and can be particularly challenging in the critical care environment. Bridging the gap between the contextual variations of academics, clinicians, and those writing and implementing policy is key to ensuring health literacy is not reserved for higher cognitive functioning individuals, whether clinicians or patients (Kaper et al., 2018). Instead, it is imperative the focus is on those most at risk and expanding their health information knowledge to drive advancement of the ability to impact patients' health literacy at all levels of cognitive ability.

An individual's ability to cope with illness and navigate the healthcare system remains a significant challenge, especially as the healthcare world increasingly moves to the use of electronic communication and telehealth, both in-hospital and in day-to-day health management and clinician interaction (Hersh, Salzman, & Snyderman, 2015). The skills necessary to address specific literacy concerns are lacking among healthcare providers and create a significant gap between the necessary elements to achieving true quality in healthcare and wellness (Kaper et al., 2018).

The Centers for Disease Control and Prevention (CDC) National Action Plan to Improve Health Literacy (2010) identifies key demographic factors impacting health literacy and outcomes cross all socioeconomic groups but "the problem of limited health literacy has been found to be even greater for older adults, those with limited education, minorities, the poor, and those with limited English proficiency" (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, National Action Plan, 2010, pg. 1). These demographics mirror the population changes in the area surrounding my organization in the recent years. The Joint Commission also has embedded health literacy into several of their requirements and initiatives where the broader focus is on patient and clinician communication (Cordero, 2018).

The inherent issue with having no clear understanding of the association between low health literacy and patient behaviors and health outcomes is the rush to implement interventions and strategies designed to impact health literacy without truly incorporating more broad definitions such as health knowledge, personal motivation, and capacity for change. Early interventions to combat health literacy have involved strategies such as rewriting educational materials at a more basic level and in multiple languages along with attempting to improve basic

reading and language comprehension, interventions which have essentially been ineffective as health literacy remains a challenge in the United States (Loan et al., 2018).

Patients in the critical care and intermediate care environment are a highly vulnerable population at risk of falling victim to poor provider-patient communication. There is limited literature available on situational health literacy and its variability across health care environments, especially in these high-risk environments (Yeh & Ostini, 2020). Identifying patients with low health literacy and putting strategies in place to educate clinicians and providers on enhanced communication techniques has the potential to mitigate these risks and improve outcomes.

Specific Aims

The aim of this project was to determine if there is a relationship between patient satisfaction with clinician communication and the health literacy level of patients or surrogate in a Progressive Critical Care Unit (PCCU) through implementation of a comprehensive clinician educational program on health literacy and enhanced communication techniques. The goal is to impact the health literacy of patients or surrogates and improve satisfaction by creating an environment where there is empowerment and engagement for each patient, every visit, across the healthcare continuum as measured on inpatient and post hospitalization surveys. Creating a sense of comfort with information being communicated and understanding information at an individualized level is key to future compliance and overall health. Utilizing a patient centered and clinician focused health literacy assessment tool and clinician communication training program addressing not only functional literacy but interactive and critical health literacy will enable clinicians to increase their capacity to fully engage patients, impacting understanding and learning at all levels necessary to improve patient and family satisfaction as well as optimize

health and health outcomes (Ernstmann, Halbach, Kowolski, Pfaff, & Ansmann, 2017; Kaper et al., 2018).

<div align="center">**Methods**</div>

Context

      This quality improvement (QI) project took place in the setting of a 39-bed PCCU with a patient population comprised of both critical care and intermediate care patients in a 269-bed suburban community hospital outside of a major metropolitan city in the Midwest. The demographic population of the immediate surrounding community has a median age of 40 with 17% age 62 and older; 11% Hispanic, 7% Asian, 15% of which are non-English speaking; a poverty rate of 4%, and median income of $104,000 (DataUSA.com, 2019). However, with consolidation or closing of several area healthcare facilities the patient population is increasingly varied and from a wider geographical area including as far away as the inner city of Chicago. This change has created an urgency to increase the ability of the organization to learn, grow, and expand responsiveness to accommodate the learning needs of our patients and their families in an increasingly diverse population (Andrulis & Brach, 2007). These demographic changes coupled with the increasing utilization of digital communication and telehealth platforms necessitate processes are put in place to identify and address health literacy issues.

      In 2018 the organization implemented TransformationPX Delivering Safe, Seamless, and Personal Care (Edwards-Elmhurst, 2018) to align with our mission, vision, and values, and move forward as a high-reliability organization. Ensuring appropriate utilization of all available resources by patients and their families will help optimize care and outcomes, creating an environment where patient centered communication serves to improve participation in the

healthcare process through greater understanding of health information while providing support regardless of health literacy level.

Systemwide strategic plans are developed each year for the organization. Utilizing the Define-Measure-Analyze-Improve-Control (DMAIC) framework, action plans are put in place to address measurable goals and outcomes for the organization. Health literacy, while recognized as a social determinant of health in Healthy People 2020 (HealthyPeople.gov., 2020), and despite the potential enormity of the financial impact, is not included in strategic planning to the degree necessary to achieve success in measured metrics such as readmission rates and patient satisfaction scores. Understanding the importance of the issue of health literacy and the impact to not only the organization but, more importantly, to patients, their health, and the health of the community, is a critical missing piece to achieving long-term goals of the organization.

Cost Benefit Analysis

In the 2007 report Low Health Literacy: Implications for National Health Policy stated inadequate health literacy has an estimated cost of $106 billion to $238 billion annually with an average cost of approximately $993 per inpatient stay for those with inadequate health literacy. The COVID 19 pandemic has complicated the provision of health care and necessitated telemedicine visits and reinforced the need for a greater understanding of health literacy for both in-person and telemedicine visits, as the cost of inadequate health literacy could be even greater.

The operational cost of the health literacy project overall and the intervention was minimal and potentially provided a significant economic benefit to the organization. The project plan includes utilization of a project leader who conducted interviews, assessments, and data collection as part of the regular workday. This coupled with the potential for improved patient

satisfaction scores leading to possible future business along with better preventative healthcare service utilization, decreased emergency room visits as well as overall hospitalizations and readmissions, can have resounding financial effects moving forward.

Interventions

This QI project was conducted in three phases, with Phase I and III being the pre- and post-intervention and Phase II the intervention on two independent and unique groups of patients and surrogates. Utilizing the DMAIC framework a critical gap in practice surrounding health literacy and clinician communication was identified and defined. In the PCCU the patient population is highly vulnerable and at risk of poor outcomes and providers at all levels have an opportunity to make a significant impact and improve outcomes. The COVID 19 pandemic has only increased this vulnerability and heightened the risk to patients and their overall health, wellness, and chance for recovery.

In Phase I of the project, patients or surrogates identified for inclusion in the project were English speaking only, cognitively aware and able to consent to participate, and were admitted to a single intensivist service in the PCCU. Health literacy was assessed utilizing the REALM-SF tool (Appendix A) and patient satisfaction was assessed through a survey adapted from the AHRQ Health Literacy Patient Survey (Appendix B) included in the Health Literacy Universal Precautions (HLUP) Toolkit for patients and/or surrogate where there is a focus health literacy, capacity for understanding, and satisfaction scores (Cifuentes et al., 2015; AHRQ, 2020). The AHRQ survey is identified as a brief, validated instrument for assessing patient literacy and satisfaction (Arozullah et al., 2007). The survey included the following questions:

1. During your stay in the ICU how often did members of the healthcare team explain things clearly and in a way that was easy to understand?

2. During your stay in the ICU how often did member of the healthcare team talk too fast?

3. During your stay in the ICU how often did members of the healthcare team leave before answering yours questions?

4. During your stay in the ICU how often did members of the healthcare team encourage you to ask questions?

5. During your stay I the ICU how often did members of the healthcare team explain the purpose of the medications they gave you?

During daily patient care rounds on the included patients over a two-week timeframe an additional 15 to 30 minutes was taken to administer the assessment and survey. This baseline data was then entered into a Microsoft Excel spreadsheet for future analysis.

In Phase II of the project, the intervention phase, a mandatory comprehensive online education program for beside clinicians and providers was administered over a two-week timeframe. The intervention focused on improving effective communication skills and the ability to tailor education to individual cognitive and psychosocial skills of patients and their families, specific disease processes and diagnoses occurring in the PCCU, as well as basic health management and follow up. The educational component included assessment of baseline understanding of health literacy through a pre- test-education-post-test strategy.

In Phase III, the post-intervention phase, the REALM-SF assessment and the AHRQ Health Literacy Patient Survey were administered over a three-week timeframe to ensure the target number of respondents was provider enough statistical power. The same inclusion and

exclusion criteria were used as previously discussed and the survey was administered in the same manner as in Phase I.

Study of Interventions

The REALM-SF assessment tool and satisfaction survey were utilized to analyze the health literacy level through an estimate of educational grade level and assess satisfaction with clinician communication on a total of 67 patients or surrogates. For the 87 clinician participants, a pre- and post-education intervention focused on understanding of and comfort level with patients' health literacy and communication ability and taking a patient-centered approach to care that supports patients and surrogates to develop the knowledge, skills and confidence they need to more effectively manage and make informed decisions about their own health and health care.

Through evaluation of 30 individual patients and 7 surrogates pre-intervention and then 23 individual patient and 7 surrogates post-intervention survey results, outcomes relative to a specific hospitalization, patient compliance with medications and follow up, and patient satisfaction we were able to assess the success or failure of the intervention, identify opportunities for improvement, and evaluate the impact of the intervention on patient satisfaction as well as any improvement in functional health literacy. Evaluation using the DMAIC process and correlating changes in outcomes enabled establishment of whether observed outcomes are due to the interventions put in place and assess the efficacy of our health literacy improvement project and its results.

Measures

While we are attempting to impact patient satisfaction, health outcomes and hospital readmissions by improving health literacy of individuals, the process measures in place need to

be focused on providers and clinicians and their ability to impact the gap between the two. A pre-
and post-intervention comprehensive survey was utilized to measure patient health literacy level
and current patient satisfaction with communication scores. Baseline health literacy score will be
obtained using a validated pre-intervention assessment tool for the target population of critical
care and progressive care patients and then a test-retest methodology of the intervention to assess
efficacy of the educational intervention for providers. Ultimately, doing a comparison study of
pre- and post-intervention results will help to prove the validity and accuracy of the interventions
and provide any statistical significance. (Chen, Yu, Hailey, & Wang, 2014; Price, Jhangiani,
Chiang, 2015).

 Analysis

Patient demographic data coupled with length of stay, readmission data, and follow-up
care accessed would allow for more comprehensive understanding of the depth of the issue and
ultimate impact of the intervention but due to time constraints were not possible with the study at
this time. A quantitative approach to data analysis of pre- and post-survey results and health
literacy assessment scores was utilized, and quantitative measures were used to collect data and
evaluate the meaning and potential impact on individuals and the overall system (Abildgaard,
Saksvik, & Nielson, 2016).

After utilizing 5-point Likert scale questions on the satisfaction survey the responses
were entered into an Excel spreadsheet as numeric values along with the REALM-SF scores
utilizing separate workbooks for patients and surrogates. A basic analysis was performed to
analyze the impact of the educational intervention and discern any changes in patient satisfaction
and health literacy level from the pre-intervention assessment.

Further analysis was then conducted to ascertain whether there was any statistical significance to pre- and post-intervention survey percentage results utilizing descriptive statistics and a boxplot method. A regression analysis of baseline satisfaction results versus baseline REALM-SF scores and fitted line plot were utilized to determine if there is a causal relationship between health literacy score and patient satisfaction results. Finally, a two proportions method was applied to determine if the educational intervention made a statistically significant difference and resulted in an impact on patient satisfaction.

Ethical Considerations

This health literacy project was presented to the Elmhurst Memorial Hospital Research Committee and Edward-Elmhurst Health Institutional Research Oversight Committee (EEH IROC) and it was determined IROC requirements have been met. Additionally, this project was exempted from further review by the EEH IRB. This project received QI determination from the UNH Nursing Clinical Review Committee.

Conflict of Interest

The project lead is employed at the organization and in the unit where the study took place. There was no conflict of interest.

Results

A total of 30 patients and 7 surrogates (N=37) were assessed for baseline level of health literacy in the pre-intervention phase, and 23 patients and 7 surrogates (N=30) were assessed in the post-intervention phase. The average patient score for health literacy of patients and surrogates pre-intervention was 6.62 and post-intervention 6.67. This represents a positive percent change in health literacy scores of 1.34%. However, when examining a boxplot analysis of post-implementation REALM-SF scores it was found that while the mean score increased

slightly from 6.62 to 6.67 and the standard deviation decreased slightly from 1.08 to 0.82, the

mean stayed the same at 7 indicating there is no significant statistical difference in health literacy

attributed to the intervention.

The average total score for satisfaction with clinician communication pre-intervention for

patients and surrogates was 31.9 and post-intervention was 33.46, which represented a positive

percent change of 14.74%. Utilizing a boxplot method of statistical analysis for patient and

surrogate satisfaction with clinician communication pre- and post-intervention it demonstrates

left skewedness of the data with a mean both pre- and post-intervention (0.78/0.81) less than the

median (0.81/0.84). An increase in both mean and median and p-value of 0.0005 indicates there

is statistical significance to the pre- and post-intervention scores (Figure 2).

Figure 2

Boxplot and Statistics of Satisfaction Pre- and Post-Intervention
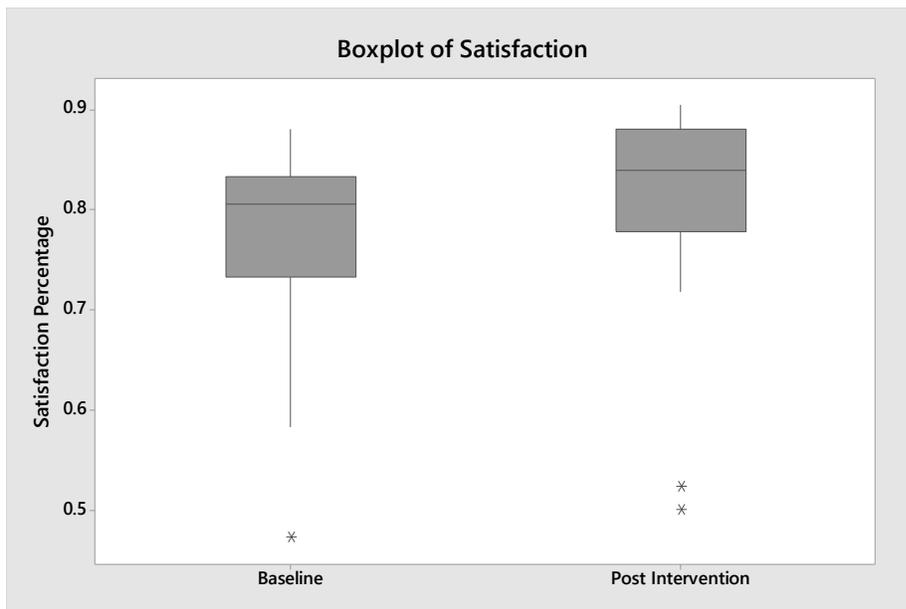
Statistics

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3	Maximum

Baseline	31	0	0.7760	0.0167	0.0932	0.4722	0.7333	0.8056	0.8333	0.8810
Post Int	28	0	0.8109	0.0186	0.0984	0.5000	0.7778	0.8397	0.8810	0.9048

Further analysis of patient and surrogate satisfaction scores and whether the education intervention made an impact on satisfaction utilized a two-sided two proportions test that demonstrated an increase in satisfaction due to the intervention. After evaluation of a total 989 points out of a total possible 1269 points in the pre-intervention phase and 929 points of a possible 1143 in the post-intervention phase, the proportion of satisfaction at baseline is 77.93% and post-intervention is 81.27%. With a p-value of 0.041, which is less than the significance level of 0.05, and the estimated difference of -0.033 being outside of the 95% confidence interval for difference of -0.065 and -0.001 indicates the educational intervention did impact patient and surrogate satisfaction with clinician communication.

A regression analysis of baseline satisfaction percentage versus baseline REALM-SF score indicates a strong positive causal relationship between health literacy scores and patient/surrogate satisfaction. As the independent variable health literacy increases the dependent variable patient satisfaction also increased. With an adjusted R-Sq of 47.62% and a p-value of 0.000, the variation in clinician communication satisfaction can be attributed to the variation in REALM-SF scores and is highly statistically significant (Figure 2).

Figure 3

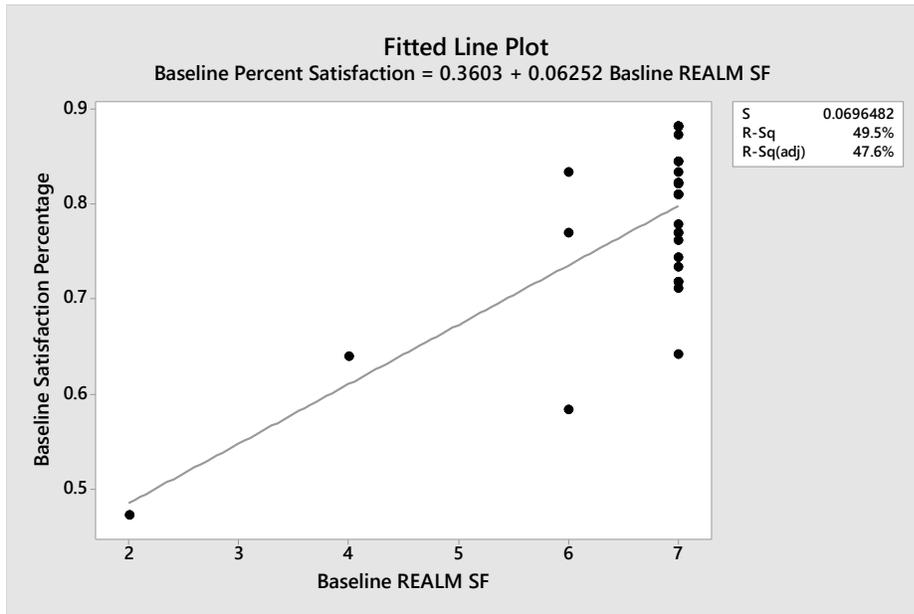*Statistical Summary and Fitted Line Plot for Baseline Satisfaction*

Model Summary

S	R-sq	R-sq(adj)
0.0696482	49.49%	47.62%

Analysis of Variance

Source	DF	SS	MS	F	P

Regression	1	0.128317	0.128317	26.45	0.000
Error	27	0.130974	0.004851		
Total	28	0.259290			

The post-intervention satisfaction percentage versus post-intervention REALM-SF scores and a fitted line plot also indicates a strong positive causal relationship between health literacy scores and patient/surrogate satisfaction with an adjusted R-Sq of 26.14% and a p value of 0.007. Post-intervention the variation in clinician communication satisfaction likewise can be attributed to the variation in REALM-SF scores and is statistically significant, but the relationship is not as strong as the baseline data had exhibited (Figure 4).
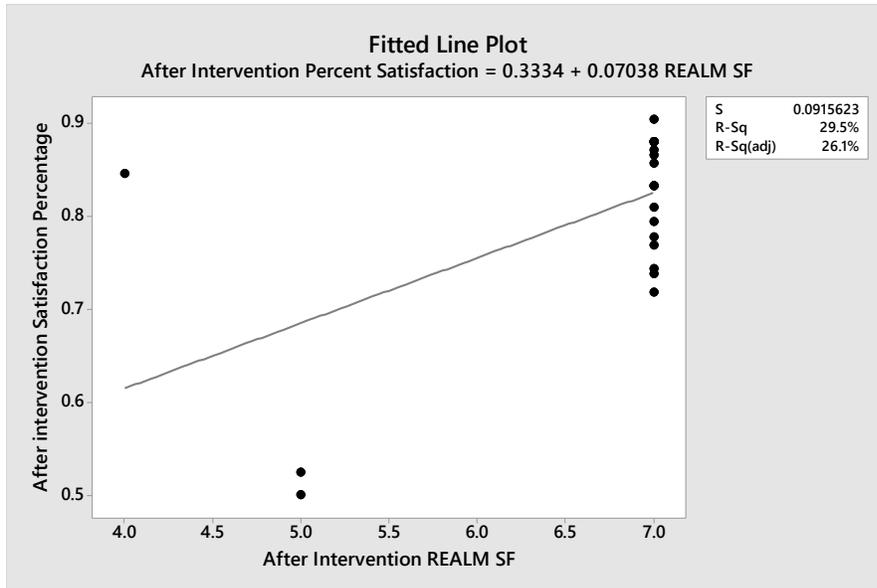
Figure 4

Statistical Summary and Fitted Line Plot for Post-Intervention Satisfaction

Model Summary

S	R-sq	R-sq(adj)

0.0915623 29.50%   26.14%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	0.073653	0.0736526	8.79	0.007
Error	21	0.176057	0.0083837		
Total	22	0.249709			

Fitted Line Plot
After Intervention Percent Satisfaction = 0.3334 + 0.07038 REALM SF

S	0.0915623
R-Sq	29.5%
R-Sq(adj)	26.1%

Discussion

Summary

    This health literacy quality improvement project utilized the DMAIC model and its data-driven strategy to determine the impact of an educational intervention focused on clinician communication and health literacy, and patient satisfaction with communication pre- and post-intervention. After administering the pre- and post-intervention satisfaction survey and health literacy assessment to patients or surrogates and evaluating the results it became evident patient satisfaction with clinician communication improved because of the planned clinician educational intervention. While there was no significant improvement in health literacy levels of patients or

surrogate that resulted from the intervention, there was a significant increase of 14.34% in satisfaction with clinician communication demonstrating the value of a comprehensive clinician educational program on what health literacy means and communication techniques to mitigate the risk of poor outcomes in a highly vulnerable population.

Interpretation

Implementation of a comprehensive clinician health literacy education program has the potential to significantly impact patient satisfaction scores with clinician communication. Post-intervention analysis demonstrates the efficacy of an educational program as well as uncovered areas for future investigation. There is a definite relationship between health literacy and patient satisfaction so an organization working to increase health literacy should have a positive result on increasing patient satisfaction with clinician communication. As with an earlier randomized-controlled trial conducted by Bell et al. (2016) our project also revealed an intervention focusing on health literacy impacts those patients or surrogates with basic or below basic health literacy more significantly than those with intermediate or proficient health literacy.

REALM-SF scores at baseline are not different than scores post-intervention indicating there is no impact of the clinician education on health literacy level of patients or surrogate. Evaluation of the data for whether there is a relationship between patient satisfaction and health literacy as measured by the survey and assessment scores indicates there is a relationship. However, that relationship is not as strong post-intervention where it demonstrates participants are still satisfied with clinician communication, but less so. This is an area that warrants further investigation with a greater N to discover if there is true statistical significance.

Limitations

In the critical care environment, there are several limitations inherent to the project including the general acuity of the patient illness. The small number of participants in this project is another limiting factor which could lead to false positives or an overestimation of any association found and necessitates careful evaluation of results. Use of the REALM-SF is another limiting factor as in its short form it relies only on correct pronunciation for scoring health literacy level. An individual may be verbally fluent and low health literacy may be masked as a result. Additionally, health literacy in this project has been measured against the patient population at a single point in time in a single critical care unit reflecting characteristics of the microsystem and inpatient population.

Conclusion

There are a great many factors that influence health literacy and a person's ability to receive, understand, and accurately interpret written and oral health communication from providers. Living below the poverty level is an influencing factor that may impact health literacy to a greater extent than any other factor. Non-insured or publicly insured patients with low health literacy levels are at higher risk for poor access to healthcare, increased emergency room visits, and increased hospitalizations, all of which substantially increase overall healthcare costs to society. Race and ethnicity, age, disability, English as a second language, and education are factors with the potential to impact health literacy, although a higher level of education alone does not guarantee a higher level of health literacy.

In our modern world of telehealth and with significantly decreased family presence at the bedside in the COVID-19 pandemic, the opportunities to impact the health and wellbeing of the population most at risk for poor outcomes by addressing health literacy abound. Health literacy

demands in the critical care environment create an even greater risk for patients and outcomes necessitating strategies be put in place for providers at all levels to improve the quality of health communication with patients and families. Understanding potential communication barriers created by low health literacy is critical to improving overall health outcomes and satisfaction.

Adults, whether patients or surrogates, with lower health literacy scores rate satisfaction with communication lower than those with proficient health literacy. Identifying this potential subset of the population in a critical care environment who would benefit from alternative, tailored communication strategies and interventions focused on health literacy can only help reduce the risk to patients, improve outcomes, and address the endemic nature of the health literacy issue.

Finally, with 21% of adults having basic health literacy levels and 14% having below basic health literacy levels, and lower literacy being linked to poorer health outcomes, this 35% of patients or surrogates are a significant target for intervention. Putting a multidisciplinary team in place and creating an effective clinician health literacy educational program is critical to understanding the rights of patients and their ability navigating complex systems of health care. Health literacy is a social determinant of health that offers a powerful opportunity to reduce inequities in health.

Funding

There were no sources of funding associated with the conduction of this quality improvement project.

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Appendix A

REALM-SF Assessment and Score Sheet

Behavior _____

Exercise _____

Menopause _____

Rectal _____

Antibiotics _____

Anemia _____

Jaundice _____

Administering the REALM-SF:

Suggested Introduction:

"Providers often use words that patients don't understand. We are looking at words providers often use with their patients in order to improve communication between health care providers and patients. Here is a list of medical words.

Starting at the top of the list, please read each word aloud to me. If you don't recognize a word, you can say 'pass' and move on to the next word."

Interviewer: Give the participant the word list. If the participant takes more than 5 seconds on a word, say "pass" and point to the next word. Hold this scoring sheet so that it is not visible to the participant.

TOTAL SCORE _____

Scores and Grade Equivalents for the REALM-SF

Score	Grade range
0	Third grade and below; will not be able to read most low-literacy materials; will need repeated oral instructions, materials composed primarily of illustrations, or audio or video tapes.
1-3	Fourth to sixth grade; will need low-literacy materials, may not be able to read prescription labels.
4-6	Seventh to eighth grade; will struggle with most patient education materials; will not be offended by low-literacy materials.
7	High school; will be able to read most patient education materials.

Appendix B

Patient/Surrogate Satisfaction Survey

Date: _____

For researcher use only:

Is the patient able to communicate?

☐ Yes

☐ No

Is family available to talk?

☐ Yes

☐ No

Who is being interviewed?

☐ Patient
☐ Spouse/Significant Other
☐ POA
☐ Mother
☐ Father
☐ Son/Daughter
☐ Sibling
☐ Other _____

Optional demographic:

If family, what is the age? _____

Patient Questions:

During your stay in the Progressive Critical Unit, how often did members of the healthcare team explain things clearly and in a way that was easy to understand?

- ☐ Never
- ☐ Sometimes
- ☐ Usually
- ☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team use medical words you did not understand when talking directly with you?

- ☐ Never
- ☐ Sometimes
- ☐ Usually
- ☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team talk too fast?

- ☐ Never
- ☐ Sometimes
- ☐ Usually
- ☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team listen carefully to you?

- ☐ Never
- ☐ Sometimes
- ☐ Usually
- ☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team leave before answering your questions?

- ☐ Never
- ☐ Sometimes
- ☐ Usually
- ☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team encourage you to ask questions?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team give instructions that were easy to understand?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team spend enough time with you?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

Medications

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team explain the purpose of the medicines they gave you?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team answer your questions about medications?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

Written Information/Supplements

During your stay in the Progressive Critical Care Unit, did a member of the healthcare team ever give you written information about your condition and care?

☐ Yes

☐ No

Did you feel this written information has given you a better understanding of your condition and care?

☐ Yes

☐ No

During your stay in the Progressive Critical Care Unit, did you undergo any procedures?

☐ Yes

☐ No

During your stay in the Progressive Critical Care Unit, how often did members of the healthcare team explain the purpose of a consent form?

☐ Never
☐ Sometimes
☐ Usually
☐ Always
☐ Not Applicable

During your stay in the Intensive Care Unit, how often did members of the healthcare team explain the purpose of a procedure?

☐ Never
☐ Sometimes
☐ Usually
☐ Always

Demographics

What is your age?

- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 to 74
- ☐ 75 to 84
- ☐ 85 to 94
- ☐ 95 or older

What is your gender identity?

- ☐ Male
- ☐ Female
- ☐ Other

What is the highest grade level you have completed to date?

- ☐ 8th grade or less
- ☐ Some high school but did not graduate
- ☐ High school graduate or GED
- ☐ Some college or 2-year degree
- ☐ 4-year college graduate
- ☐ More than a 4-year college degree
- ☐ Post graduate degree

Are you of Hispanic or Latino descent?

- ☐ Yes
- ☐ No

Is English your first language?

- ☐ Yes
- ☐ No

If not first language, what is? _____

What is your race?

- ☐ White
- ☐ Black or African American
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ American Indian or Alaskan Native
- ☐ Other _____
- ☐ Prefer to not answer