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The effect of provider education on discharge information grade level and readability

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The Effect of Provider Education on

Discharge Information Grade Level and Readability

Amber V. Balzer

A Clinical Research Project
submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillment of the Requirements

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FACULTY COMMITTEE:

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Dedication & Acknowledgments

I dedicate this work to my husband, Phillip, who has been my biggest supporter in the pursuit of this degree. I would also like to acknowledge the faculty and advisors who have provided unconditional support and enthusiasm throughout this project.

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Abstract

Problem: The peri-discharge period for patients can be a complex and dangerous time. A large urban academic medical center with a readmission rate approaching 16% utilizes a standardized template called a Discharge Information Form (DIF) to convey information to inpatients at the time of their discharge. The problem is a lack of individualization with a universal template such as the DIF. Moreover, the readability and literacy level of the DIF have not been previously assessed.

Methods: A random sample of DIFs was assessed for literacy level using the Flesch-Kincaid Readability Test Tool. An in-person educational intervention was administered to a sample of Hospital Medicine Advanced Practice Providers with the objective of improving their understanding of DIF readability. The providers completed the Continuing Professional Development-Reaction Questionnaire before and after the educational intervention to assess clinical behavioral intentions. One-month post intervention a survey was administered to assess self-reported behavior change, and descriptive statistics were used to look for trends in these data. DIFs were also reassessed for readability, and a paired sample t-test was performed to determine if a change occurred.

Findings: After the intervention, statistically significant differences were found in the construct of *social influence* (p=0.040). Grade level of DIFs was significantly improved (p=0.001), readability of DIFs was nearly significantly improved (p=0.051), and the majority of providers self-reported behavior change.

Conclusion: Providers responsible for creating patient discharge information should know how to write literacy level appropriate materials. There is an opportunity to improve discharge information readability through inpatient provider education.

Introduction

In the acute care setting, all patients are given written discharge instructions at the time of their release from the hospital. Information conveyed in these instructions includes crucial topics such as medications, summary of the hospital stay, specific disease process instructions, activity restrictions, dietary restrictions, symptoms requiring calls to 911 or their primary care provider, and follow-up appointments. In order for patients to follow these instructions and remain out of the hospital, the instructions must be written in a way that patients are able to comprehend (Institute for Healthcare Improvement, 2019).

A priority of the Affordable Care Act is to reduce hospital readmissions (NEJM Catalyst, 2018). To meet this initiative, Medicare instituted the Hospital Readmissions Reduction Program (HRRP) which penalizes acute-care hospitals with 30-day readmission rates higher than similar health care systems (NEJM Catalyst, 2018). With evidence demonstrating that patients with low health literacy are more likely to experience hospital admissions and longer lengths of stay (Choudhry et al., 2015), training providers on techniques to improve both readability and grade level of written materials is both an ethical and financial responsibility of health systems.

Problem Description

A large urban academic medical center has a 30-day readmission rate approaching 16%. The Division of Hospital Medicine within this center discharged 6,149 patients in 2018. This constitutes over 19% of the total number of patients discharged from the institution. Current practice for this division is to utilize a standardized template called a Discharge Information Form (DIF) to convey information to all inpatients at the time of their discharge from the hospital. With a universal template such as the DIF, individualization to patient needs can be lacking, which is problematic. Moreover, the readability and literacy level of the DIF have not

been previously assessed. In a time when patient-centered care and patient satisfaction are increasingly critical to the delivery of healthcare, it is vital to educate the providers responsible for creating the DIF on the individualized needs of patients based on their reported preferences.

In order to have an understanding of patient preferences within the large urban academic medical center, the Patient Perceptions of Relative Importance of Discharge Elements (PRIDE) Study was designed. The PRIDE study was a cross-sectional survey completed in early 2019. The survey (see Appendix A) allowed patients to rank the relative importance of common elements of discharge instructions and collected basic demographic information. Results of this study determined that regardless of age, race, gender, educational level, and medical comorbidities, patients admitted to this hospital perceived medication information as having the highest relative importance (Balzer et al., 2019).

Background and Significance

The peri-discharge period can be a complex and dangerous time for patients discharged from the local health system, with nearly 16% of patients requiring readmission. When considering ways to prevent the dangers associated with this period, the Agency for Healthcare Research and Quality (2018) suggests that structured and patient-centered discharge communication is crucial. The Joint Commission mandates information that must be included in all discharge communication including; the reason for hospitalization, significant findings, procedures and treatment provided, patient's discharge condition, patient and family instructions, and attending physician signature (Horwitz et al., 2013). This study focused on the area of patient and family instructions, which typically includes topics such as discharge medications, activity orders, therapy orders, dietary instructions, and medical follow up. In previous studies at

the national level, readability, understandability, and completeness of these areas have been

shown to be subpar (Unaka et al., 2017).

Health literacy refers to a patient's ability "to obtain, process, and understand basic health

information and services needed to make appropriate health decisions" (U.S. Department of

Health and Human Services, 2010). Health literacy affects numerous aspects of hospitalization

including navigating the healthcare system, completing complex forms, locating providers and

services, sharing personal information, engaging in self-care and chronic-disease management,

and understanding mathematical concepts, such as probability and risk (Health Literacy Basics,

2017). Factors such as stress and sickness have been shown to decrease health literacy, and lower

health literacy rates are linked to increased hospitalizations as well as readmissions (Agency for

Healthcare Research and Quality, 2013). Therefore, the Joint Commission's (2007) accreditation

standards highlight the need for patients to receive information about their care in a way in which

they can understand.

In order to be effectively understood by the average adult, patient and family instructions

should be written at a 6th-grade level, according to the National Institutes of Health, the US

Department of Health and Human Services (2000), and the American Medical Association

(1999) (as cited in Choudhry et al, 2016). Despite these guidelines, discharge instructions are

frequently written at a much higher level, often requiring a college graduate reading level to

comprehend (Choudhry et al., 2016). Providers should focus on strategies to increase awareness

in matching patient-oriented information to appropriate levels of literacy (Choudhry et al., 2016),

and in order to accomplish this task, providers must both be aware of the educational levels of

their patients, and have an understanding of the preferences associated with each educational

level.

A variety of other factors affect how patients comprehend discharge instructions including age, sex, medical comorbidities, and language. It has been found that increasing age has been associated with non-comprehension of medications and follow up instructions, male sex has been associated with non-comprehension of diet instructions, and depression has been associated with medication non-compliance (Albrecht et al., 2014). 8.6% of the United States population demonstrates Limited English Proficiency and are 40% more likely to experience physical harm from an adverse event than their English-speaking counterparts (Agency for Healthcare Research and Quality, 2018). In order to provide quality care, it is crucial for providers to understand how a variety of factors influence the way patients receive and interpret discharge communication.

Efforts to improve discharge information readability nationwide have demonstrated some success. Boston University Medical Center and the Agency for Healthcare Research and Quality created the Re-Engineered Discharge (RED) which has proven effective at reducing readmissions and posthospital emergency department visits, while also improving patient satisfaction by enforcing twelve components of the discharge process (Boston University, 2014). These components include "identify the correct medicines and a plan for the patient to obtain and take them, teach a written discharge plan the patient can understand, educate the patient about his or her diagnosis, review with the patient what to do if a problem arises" (Boston University, 2014). Many of these identified components fall into the category of patient and family instructions which will be the focus of this study. The Joint Commission also supports efforts made by health systems to meet the Standards of Care for Transitions, which is a set of guidelines created by the multistakeholder Transition of Care Consensus Conference (as cited in, Polster, 2015).

On a local level, Marcantoni, Finney, & Lane (2015) aimed to improve the literacy level of discharge communication by utilizing an educational brochure written at a seventh-grade reading level compared to traditional discharge teaching and found that the standardized lower literacy level tool improved post-hospital follow-up adherence. Mueller, Giannelli, Boxer, & Schnipper (2015) found that the use of disease specific templated discharge instructions was associated with better readability than the use of clinician-generated discharge instructions. Waniga, Gerke, Shoemaker, Bourgoine, & Eamranond (2016) found that patient satisfaction in the discharge domain was significantly increased after the implementation of a nurse and physician generated standardized teaching tool targeting discharge communication.

Numerous studies have been completed with the goal of improving the hospital discharge process. El-Eid, Kaddoum, Tamim, & Hitti (2015) found that improving the timeliness of hospital discharge by aiming to have patients discharged before noon each day can decrease length of stay, save money, and improve hospital and emergency department throughput. Kwan, Bell, Morgan, & Stewart (2013) found that implementing a patient navigator within the healthcare team to coordinate patient care, communicate with patients and families, and oversee care transitions can decrease length of stay. Some studies aimed at increasing support after discharge through interventions such as a discharge phone call allowing staff to provide better, more detailed discharge instructions to patients after they arrived home gave improved medication management, follow-up appointment reminders, and opportunities for answering patient questions (Schuller, Lin, Gamm, & Edwardson, 2015). Efforts to improve care transitions perceived as the most helpful by patients include speaking to the pharmacist, receiving an illustrated medication schedule, receiving a follow-up phone call at home, and getting help from friends and family (Cawthon et al., 2013).

Some studies have focused on improving hospital discharge through the nursing staff providing discharge instructions. One of the most important duties nurses have is to prepare patients for discharge by teaching patients about their conditions, medications, self-care strategies and the importance of follow-up care (Jakucs, 2018). One method explored educating nurses to utilize the teach-back method to ensure patients understood discharge instructions, which demonstrated an increase in patient satisfaction (Burke, 2018). Another method encouraged utilizing "do not disturb" signs to create an uninterrupted block of time for discharge teaching (Polster, 2015). Despite the large amounts of literature surrounding the discharge process, few studies have focused on directly educating the providers responsible for creating discharge instructions.

Gaps in existing literature have been identified including limited data suggesting how healthcare providers believe discharge communication should be prioritized. Blaine, et al. (2018) indicated discharge education/teach-back and involving the care team as areas perceived by providers as having the highest importance, and Sorita, et al. (2017) notes medical history, physical findings, cognitive and functional status at discharge, and rationale for medication changes to be "very important." Although patient satisfaction with discharge information strongly correlates to overall satisfaction with hospital care (Waniga, Gerke, Shoemaker, Bourgoine, & Eamranond 2016), there is limited literature in which patients rate their perceived relative importance of discharge information, and no evidence deciphering whether educational level plays a role in relative importance rankings. Corser, Dontje, Neuberger, Chant, & Keskimaki (2017) found that 44% of patients felt that improvements were needed in the areas of formatting/layout, clarity, correcting discrepancies/omitted information, or providing the document in electronic form, therefore determining how receiving this information is prioritized

and improving readability could help to make discharge communication more patient-centered to prevent readmissions and adverse events.

Given the lack of information about provider prioritization of discharge instructions nationally, and the general lack of information within the local health system about current readability of discharge information, this study was needed. The general purpose of this study was to assess the readability of local discharge information, present providers with practical tools to improve the readability of written instructions, and determine if a change in practice occurred.

Rationale

The framework used to guide the intervention is The Four-Level Model of the Healthcare System adapted from Ferlie and Shortell (2001). The conceptual model is shown in Appendix B. This model was chosen because it illustrates the concept of patient-centered care and its importance within the healthcare system. This model consists of four interconnected levels including the *Patient* at the center, surrounded by the *Care Team*, surrounded by the *Organization*, and finally encircled by the *Environment* (National Academy of Engineering and Institute of Medicine, 2005). It is crucial to identify the individual patient with their unique beliefs, desires, and needs as the nucleus for all healthcare interactions because "the role of the patient has changed from a passive recipient of care to a more active participant in care delivery" (National Academy of Engineering and Institute of Medicine, 2005). This framework calls upon healthcare providers to view patients and their families as "partners" allowing them to incorporate their needs and preferences into a free exchange of information with the healthcare team in which patients can communicate needs, participate in decision making, and assist in coordination of care (National Academy of Engineering and Institute of Medicine, 2005).

The Four-Level Model of the Healthcare System highlights the importance of patients and their support systems having access to tools, information, and education to help them navigate and integrate the critical but often overwhelming world of healthcare. This is the area in which the Care Team (anyone involved in delivering care to the patient) will implement the proposed intervention. The framework urges providers to be more responsive to the needs and preferences of patients which will be enhanced through the educational intervention developed in order to resolve the gap in present care.

A Plan-Do-Study-Act (PDSA) cycle was used to develop and implement the intervention. This concept comes from the Institute for Healthcare Improvement Model for Improvements and helps to focus and accelerate quality improvement initiatives (Agency for Healthcare Research and Quality, 2013). Planning this intervention included performing a literature review to identify gaps in practice and creating the idea for the project. Doing this intervention included carrying out the necessary steps to complete it. Studying this project included analyzing the data and results to determine if the aims were met. Acting after completion of this project included determining what worked well and what could be improved in future cycles. This intervention was expected to work because the concept of a continuous PDSA cycle allows researchers to make changes after results have been analyzed to improve the quality improvement initiative in the future. One PDSA cycle was utilized for the purpose of this project.

Purpose

The purpose of this study was to assess the readability of local discharge information, present providers with practical tools to improve the readability of written instructions, and determine if a change of practice occurred. This was accomplished by utilizing the data collected in the PRIDE study (Balzer et al., 2019) to determine if there was a difference in patient

perception of the relative importance of discharge information, assessing the literacy level of the discharge information, and conducting an educational intervention for providers responsible for creating DIFs. The providers completed the Continuing Professional Development (CPD)-Reaction Questionnaire before and after the educational intervention to assess the impact of the intervention on clinical behavioral intentions (Légare et al., 2017). One-month post intervention a survey was administered to Advanced Practice Providers (APPs) to assess self-reported behavior change, and DIFs were assessed to determine if readability improved.

The aims were to:

1) Assess the literacy level of a random sample of DIFs used at patient discharge before and after the intervention.

2) Educate Advanced Practice Providers regarding the importance of literacy level and perceived importance of the information provided on the DIF.

3) Assess the impact of the intervention on clinical behavioral intentions and self-reported behavior change.

Methods

Location

The large urban academic medical center in which the intervention took place is a Joint Commission accredited level I trauma center containing over 800 beds (American Hospital Directory, 2018), and serving a vastly diverse patient population. This institution's mission statement is driven by quality and safety "to preserve and restore health for all people, to seek the cause and cure of diseases through innovative research, and to educate those who serve humanity", with a vision "committed to excellence in patient care and education as the preeminent academic medical center in the mid-Atlantic region (Redacted, 2019). Over the last

three years, the medical center has discharged an average of 36,956 patients each year (Redacted, 2018).

Contextual Elements

Contextual elements considered important at the outset of the intervention were communication between educator and recipient as well as learner willingness to change practice, because evidence-based practice relies both on disseminating the information and learner readiness to incorporate this information into practice (Young & Newell 2008). Other important contextual elements include recipient perception of educator's leadership, recipient perception of Doctor of Nursing Practice programs, and recipient patient/task load during an educational intervention. Understanding and managing these contextual elements is crucial because implementation research demonstrates that "when a majority of contextual elements are conducive to change, implementation is usually successful" (McCullough et al., 2015).

Ethical considerations

This study was granted approval by both the Institutional Review Boards of the health system and James Madison University. This study posed no risks greater than those of everyday life to those involved and participation was entirely voluntary. Participation could be terminated at any time without penalty. All information collected was kept strictly confidential and was stored in a secure manner. Participants were notified of these facts in a written statement present on the questionnaires. Paper survey data were immediately entered into an excel spreadsheet maintained on a password protected computer within the institutional firewall of the health system. Paper surveys were shredded once information was entered into the spreadsheet. When this information needed to be transported off of the health system premises, an encrypted flash drive was used. The researcher reported no potential conflicts of interest.

Baseline Measures

The initial assessment consisted of screening a random sample of fifty DIFs for grade level and readability. The random sample of DIFs was generated by the researcher monitoring the hospital discharge tracking system for patients flagged for discharge each day. Once a patient was flagged for discharge, the researcher screened the DIF to determine if it was created by a Hospital Medicine Advanced Practice Provider. Only DIFs created by Hospital Medicine APPs were utilized for inclusion.

After being identified for inclusion within the study, each DIF was assessed for grade level and readability using the Flesch-Kincaid Tool. The Flesch-Kincaid tool is the most widely used readability tool in the United States and provides users with two separate assessments (Flesch-Kincaid, 2019). The first assessment represents reading ease, and text is assigned a number between zero and one hundred using the formula 206.835 - 1.015 x (words/sentences) - 84.6 x (syllables/words) (Flesch-Kincaid, 2019). Low numbers represent complexity, therefore the higher the number, the lower the content complexity (Flesch-Kincaid, 2019). The second assessment provides users with the American school grade level required to understand the provided text using the formula 0.39 x (words/sentences) + 11.8 x (syllables/words) - 15.59 (Flesch-Kincaid, 2019). This data provided a baseline for comparison.

Intervention

Next, an educational intervention was created and administered as an in-person poster presentation to ten Hospital Medicine APPs at an APP staff meeting. The APPs were identified through convenience sampling and included both Nurse Practitioners and Physician Assistants. The APPs were the recipients of the educational intervention because they are responsible for creating a majority of DIFs. A poster presentation format was chosen in order to summarize

information concisely and attractively, to help publicize information, and to generate discussion (NYU Libraries, 2018). This format increased the likelihood of reaching all department APPs because it was directly administered by the project director who was then available to answer any questions and participate in dialogue. Poster presentation dialogue has been shown to generate new ideas about applying or extending existing work, and raising new questions or suggestions to educate both the participants, and the researcher (Miller, 2007). This information helped to improve the intervention for future PDSA cycles. Prior to the staff meeting in which the presentation took place, an announcement email was sent to the APPs which can be seen in Appendix C.

       The content of the poster presentation consisted of five sections including Abstract, Background, Our DIF Scores – March 2019, Action Steps, and How Will We Know if we are Successful. The Abstract section contained general information to introduce the project. The Background section discussed that most healthcare information is written at a reading level much too high for patients to effectively comprehend (Choudhry et al., 2016), the results of the PRIDE study (Balzer et al., 2019), and local health system information including rates of hospital discharges and readmissions. The Our DIF Scores – March 2019 section explained both the American Grade Level and Readability Score concepts and goal values, as well as contained graphs visually depicting the mean American Grade Level and Readability Scores of the surveyed DIFs. The Action Steps section contained practical suggestions for methods to improve grade level and readability, such as including the most important information first, limiting the number of messages, choosing words carefully, limiting jargon and technical terms, wording things in the positive, and emphasizing importance with bold (US Department for Health and Human Services & Centers for Disease Control and Prevention, 2009). The How Will We Know

if we are Successful section, cited improvements of follow up grade level and readability scores as well as provider self-report as measures of success. This structure allowed for future PDSA cycles to utilize or adapt the existing poster presentation to continue improving the process. The poster presentation can be seen in Appendix D.

Team

The team involved in the work included a Doctor of Nursing Practice (DNP) student project director providing the educational intervention and assessing response, as well as the advanced practice providers employed within the Hospital Medicine service who were the recipients of the intervention. The team also included a faculty advisor from James Madison University who acted as Committee Chair, a statistician, and a terminal degree advisor from within the health system.

Outcome Measures

The measures chosen include the CPD-Reaction questionnaire (Légare et al., 2017), the Flesch-Kincaid Readability Test Tool (Flesch-Kincaid, 2019), and a provider self-report survey (Légare et al., 2017). These measures helped meet the aims of assessing the average DIF literacy level, assessing the impact of the intervention, and assessing the effectiveness of the intervention. The rationale for choosing these measures was to reproduce a previously completed study. The operational definition of practice change was measured by a survey, and the operational definition of behavioral intention was measured by the CPD-Reaction tool. There were no specific measures to establish whether the observed outcomes were due to the intervention.

     CPD-Reaction Questionnaire

First, the mean rankings of each CPD-Reaction construct were compared from before and after the intervention. The CPD-Reaction constructs are: *behavioral intention*, *social influence*,

beliefs about capabilities, *moral norm*, and *beliefs about consequences* (Légare et al., 2017). The

construct *behavioral intention* assesses participants planning and intention to incorporate

behavior change (Légare et al., 2017). The construct *social influence* measures participants

beliefs surrounding whether peers do exhibit, or will exhibit, the targeted behavior (Légare et al.,

2017). The construct *beliefs about capabilities* gauges participants confidence, in ease and ability

to adopt behavior change (Légare et al., 2017). The construct *moral norm* evaluates how ethical

and acceptable participants believe behavior change would be (Légare et al., 2017). The

construct *beliefs about consequences* measures how useful and beneficial participants believe

behavior change would be (Légare et al., 2017).

  The CPD-Reaction Questionnaire is a valid and reliable "12-item instrument based on an

integrated model combining a number of social cognitive theories for explaining health

professionals' clinical behavior through the proxy of intention" with Cronbach's coefficients for

the constructs varying from 0.79 to 0.89, as well as moderate test-retest reliability with weighted

kappa values between 0.40 and 0.60 (Légare, Borduas, Freitas, & Turcotte, 2015). It also

demonstrates construct validity with an exploratory factorial analysis confirming the presence of

five constructs and a proportion of variance explained by each factor being superior to 5%

(Légare et al., 2015).

  This instrument is based on the assumption that three categories of variables predict

health professionals' behavior, 1) their intention to adopt a particular behavior or not; 2) their

beliefs about their capabilities; and 3) their past behavior and habits (Légare et al., 2017). This

tool has been successfully utilized in numerous populations including acute care nurses after a

workplace violence training program (Lamont & Brunero, 2018), primary care providers after an

online dementia care educational series (Bentley, Kerr, Ginger, & Karagoz, 2019), and acute care

providers after an educational intervention on non-pharmacological pain management (Booth, 2019). This tool assessed the impact of the educational intervention on clinical behavioral intentions, estimated the predictive potential for subsequent behavior change, and collected basic demographic information about participants.

Provider Self-Report

Second, providers self-reported behavior changes as well as the percentage of clinical cases in which the behavior was adopted. This was used to assess the effectiveness of the intervention as providers were questioned regarding their perception on both improving the grade level and readability of discharge information, and incorporating patient preferences within discharge information. These questions were developed by the researcher and therefore there was no specific validity or reliability data regarding this tool.

Post-Intervention DIF Scores

Third, DIFs before and after the intervention were compared for readability and grade level utilizing the Flesch-Kincaid Readability Tool (2019). This assessed for pre-intervention grade level and readability of DIFs, post-intervention grade level and readability of DIFs, to better understand the effectiveness of the intervention.

Data Collection Methods

Immediately before and after the educational intervention, APPs completed a pen and paper survey containing the CPD-Reaction Questionnaire (Légare et al., 2017), which was adapted for this quality improvement project and can be found in Appendix E. Ten APPs were recruited to participate via convenience sampling by the researcher at an APP staff meeting.

One month after the intervention, those who initially completed the survey were contacted in person to complete a second pencil and paper survey to self-report behavior change

and estimate the percentage of clinical cases in which the behavior was adopted utilizing a four question Likert scale survey developed by the researcher. This survey can be found in Appendix F. At this time, a second sample of 50 DIFs was collected and evaluated utilizing the same procedure as the pre-intervention DIF assessment to determine if a change in practice occurred.

Informal ongoing assessment of the contextual elements of communication and learner willingness to change were monitored by the DNP student completing the educational intervention and administering the surveys. The student was available in person and by phone for questions or clarifications within the one month between the intervention and the follow up survey. No official notes or data were kept regarding this ongoing assessment.

The methods employed for ensuring completeness and accuracy of data collection included two individuals reviewing and recording the survey data, as well as an in-person review of surveys as they were completed to ensure all questions were answered. The methods employed for ensuring completeness and accuracy of data analysis include the researcher consistently utilizing the same Flesch-Kincaid website application for every DIF analysis.

Analysis

SPSS version 24 (IBM Corporation, 2016) was used for data analysis. It was understood that variation within the data could occur with time due to both random variation and time trend variation. The random variation could not be controlled, however in an effort to control for time trend variation, follow up survey data as well as the second sample of DIFs were collected within a 6-day timeframe one month after the intervention.

CPD-Reaction Questionnaire

Table 1 summarizes how items from the CPD-Reaction questionnaire were calculated according to the method created by Légare, and combined for analysis (Légare et al., 2017).

"Each item response format was pre-coded with Likert-type scale values (Table 1). The item score for each participant ranges from 1 to 7. A score for each construct was obtained by calculating the mean score for the construct (e.g., if the construct includes 2 items, the item scores were summed and divided by 2, yielding a score between 1 and 7)" (Légare et al., 2017).

Utilizing this formula, the questions "I intend to [behavior]" and "I plan to [behavior]" create the *behavioral intention* construct. The questions, "To the best of my knowledge, the percentage of my colleagues who [behavior] is", "Now think about a co-worker whom you respect as a professional, in your opinion, will he/she [behavior]", and "Most people who are important to me in my profession will [behavior]", create the *social influence* construct. The questions "I am confident that I could [behavior] if I wanted to", "For me, [behavior] would be", and "I have the ability to [behavior]", make up the *beliefs about capabilities* construct. The questions "[behavior] is the ethical thing to do", and "It is acceptable to [behavior]", make up the *moral norm* construct. Lastly, the questions "Overall, I think that for me [behavior] would be" useless to useful and harmful to beneficial, create the *beliefs about consequences* construct. The mean rankings of each of these constructs were compared before and after the intervention using a paired sample t-test.

Table 1.

Construct Calculations

Construct Scale		Items	Response Choices	Score by Construct
Intention	I_1	I intend to [*behavior*]	Strongly disagree/agree	$(I_1+I_7)/2$
	I_7	I plan to [*behavior*]	Strongly disagree/agree	
Social Influence	I_2	To the best of my knowledge, the percentage of my colleagues who [*behavior*] is…	0-20%	$(I_2+I_6+I_9)/3$
			21-40%	
			41-60%	
			61-80%	

			81-100%	
	I_6	Now think about a coworker whom you respect as a professional. In your opinion, does he/she [*behavior*]?	Never/Always	
	I_9	Most people who are important to me in my profession [*behavior*]	Strongly disagree/agree	
Beliefs about capabilities	I_3	I am confident that I could [*behavior*] if I wanted to	Strongly disagree/agree	$(I_3+I_5+I_{11})/3$
	I_5	For me, [*behavior*] would be…	Extremely difficult/easy	
	I_{11}	I have the ability to [*behavior*]	Strongly disagree/agree	
Moral norm	I_4	[*Behavior*] is the ethical thing to do	Strongly disagree/agree	$(I_4+I_{10})/2$
	I_{10}	It is acceptable to [*behavior*]	Strongly disagree/agree	
Beliefs about consequences	I_8	Overall, I think that for me [*behavior*] would be…	Useless/Useful	$(I_8+I_{12})/2$
	I_{12}	Overall, I think that for me [*behavior*] would be…	Harmful/Beneficial	

Descriptive statistics such as frequencies, means with standard deviations, or medians with interquartile range were used to summarize participant characteristics and CPD-Reaction questionnaire item responses (Légare et al., 2017) for all quantitative data. Testing of normality was performed on the CPD-Reaction questionnaire responses including skewness and Kurtosis which demonstrated a slight deviation from the normal distribution. Skewness and Kurtosis measures were 1.36 and 0.11 for the *behavioral intention* construct, 0.92 and 3.10 for the *social influence* construct, 0.78 and -0.49 for the *beliefs about capabilities* construct, 0.89 and -0.16 for the *moral norm* construct, and 1.04 and -1.22 for the *beliefs about consequences* construct. Given that data were only slightly non-normally distributed, a paired sample t-test was used to compare the mean ranks of each construct obtained before and after professional development activities (Légare et al., 2017). To examine if the assumption of normal distribution might have affected our results, the Wilcoxon signed ranks test was also completed.

Provider Self-Report

Nonparametric testing utilizing a Mann-Whitney test was performed to analyze DIF scores pre and post-intervention as these data were non-normally distributed. This test was utilized to interpret mean ranking. Data were treated as independent because one hundred different DIFs were sampled during a before and after time period.

Post-Intervention DIF Scores

The self-reported behavior change surveys were reported as percentages as this information was only collected from participants at one point in time.

Results

Demographic Information

Overall, 10 participants completed the CPD-Reaction Questionnaire before and after the intervention with a 100% survey response rate (Table 1). 90% of respondents were female, 80% of respondents were Caucasian, with 60% of participants ranging in age from 25 to 34 years old. A majority of participants had practiced both as registered nurses for 1 to 5 years (70%), and as nurse practitioners for 1 to 5 years (80%).

Table 1.		
Demographic Information		
Characteristics	Category	N % Total = 10
Age (years)	25 - 34	6 (60)
	35 - 45	3 (30)
	45 - 54	0 (0)
	55 - 64	1 (10)

	65 - 74	0 (0)
Gender	Male	1 (10)
	Female	9 (90)
	Other	0 (0)
Race	Caucasian	8 (80)
	African American	2 (20)
	Hispanic	0 (0)
	Other	0 (0)
Years as RN	1 - 5	7 (70)
	6 - 10	2 (20)
	11 - 15	0 (0)
	16 - 20	0 (0)
	21 - +	1 (10)
Years as NP	1 - 5	8 (80)
	6 - 10	1 (10)
	11 - 15	1 (10)
	16 - 20	0 (0)
	21 - +	0 (0)

CPD-Reaction Questionnaire

Each construct was compared before and after the educational intervention to determine if a change occurred. Mean results descriptively increased in all categories including *behavioral intention* (6.25 to 6.50), *social influence* (4.83 to 5.43), *beliefs about capabilities* (5.40 to 6.10), *moral norm* (6.35 to 6.65), and *beliefs about consequences* (6.45 to 6.60) (Table 3). Statistically

significant increases were found only in the area of *social influence* (p=0.040) (Table 4). As the

statistical results were similar between paired t-test and Wilcoxon signed rank test, results from

the paired sample t-test are reported.

Table 3.

Construct Comparison

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	IntentionPre	6.25	10	1.03	0.33
	IntentionPost	6.50	10	0.85	0.27
Pair 2	SocialInflencePre	4.83	10	1.06	0.33
	SocialInfluencePost	5.43	10	0.93	0.29
Pair 3	CapabilitiesPre	5.40	10	0.94	0.30
	CapabilitiesPost	6.10	10	0.74	0.23
Pair 4	MoralNormPre	6.35	10	0.78	0.25
	MoralNormPost	6.65	10	0.63	0.20
Pair 5	ConsequencesPre	6.45	10	0.80	0.25
	ConsequencesPost	6.60	10	0.70	0.22

Table 4.

Paired Sample Test

		Mean	Std. Dev.	Std. Error Mean	95% Confidence Interval Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	IntentPre IntentPost	-0.25	0.42	0.13	-0.55	0.05	-1.86	9	0.10
Pair 2	SocialPre SocialPost	-0.60	0.77	0.24	-1.15	-0.05	-2.48	9	**0.04**
Pair 3	CapablePre CapablePost	-0.70	1.12	0.35	-1.50	0.10	-1.98	9	0.08
Pair 4	MoralPre MoralPost	-0.30	0.71	0.23	-0.81	0.21	-1.33	9	0.22
Pair 5	ConsequencePre ConsequencePost	-0.15	0.24	0.08	-0.32	0.02	-1.96	9	0.08

Provider Self-Report

Of the original 10 participants, 100% completed the one month follow up survey to self-report behavior change in the areas of improving DIF readability and incorporating patient preferences. 80% of APPs reported that they agreed or strongly agreed that they had increased the readability of their DIFs, and 40% felt that they had improved readability in 80-100% of clinical cases in the preceding 30 days. 70% of APPs reported that they agreed or strongly agreed that they had incorporated patient preferences into their DIFs, and 60% felt that they had incorporated patient preferences in 80-100% of clinical cases in the previous 30 days.

Table 7.

Self-Reported Behavior Change

Question	Category	N	%
		Total = 10	
In the last month I have increased the readability of my DIFs:	Strongly Agree	4	(40)
	Agree	4	(40)
	Somewhat Agree	1	(10)
	Neither Agree nor Disagree	1	(10)
	Somewhat Disagree	0	(0)
	Disagree	0	(0)
	Strongly Disagree	0	(0)
The percentage of clinical cases in which I improved the	81 - 100%	4	(40)
	61 - 80%	3	(30)
	41 - 60%	2	(20)
	21 - 40%	1	(10)

readability of my DIFs:	0 - 20%	0	(0)
In the last month I have incorporated patient preferences in my DIFs:	Strongly Agree	5	(50)
	Agree	2	(20)
	Somewhat Agree	1	(10)
	Neither Agree nor Disagree	2	(20)
	Somewhat Disagree	0	(0)
	Disagree	0	(0)
	Strongly Disagree	0	(0)
The percentage of clinical cases in which I incorporated patient preferences in my DIFs:	81 - 100%	6	(60)
	61 - 80%	1	(10)
	41 - 60%	2	(20)
	21 - 40%	1	(10)
	0 - 20%	0	(0)

Pre/Post-Intervention DIF Scores

Initial DIF assessments demonstrated a mean grade level of 9.5 ranging from 8th to 16th grade. Initial readability scores demonstrated a mean of 61.70 ranging from 35.80 to 67.70. Analysis of 50 DIFs after the educational intervention, found that mean grade level decreased from 9.5 to 7.2 with range decreasing from 8th to 16th grade to a range of 5th to 10th grade. Mean readability scores increased from 61.70 to 64.25 with a range increasing from 35.80 to 67.70 to a range of 55.90 to 74.40. Statistical differences are explained with the Mann-Whitney Ranks (Table 5), and Mann-Whitney Testing (Table 6). Statistically significant changes were found in grade level (p=0.001), and near statistically significant changes were found in readability (p=0.051).

Table 5.

Mann-Whitney Ranks

	Time	N	Mean Rank	Sum of Ranks
DIFs	Pre	50	50.50	2525.00
	Post	50	50.50	2525.00
	Total	100		
Grade Level	Pre	50	60.32	3016.00
	Post	50	40.68	2034.00
	Total	100		
Readability	Pre	50	44.84	2242.00
	Post	50	56.16	2808.00
	Total	100		

Table 6.

Mann-Whitney Testing

	DIFs	Grade Level	Readability
Mann-Whitney U	1250.00	759.00	967.00
Wilcoxon W	2525.00	2034.00	2242.00
Z	0.00	-3.39	-1.10
Asymp. Sig. (2-tailed)	1.00	**0.001**	**0.051**

Discussion

The Joint Commission has set literacy benchmarks for hospitals to achieve (The Joint Commission, 2007), the Institute of Medicine has set improving health literacy as a crucial quality improvement goal (Institute of Medicine, 2004), and other highly influential organizations such as the American Medical Association (1999) have recommended enhanced research surrounding health literacy and increased education for the medical community since as early as 1999. With these recommendations and the increased focus of health systems on preventing readmissions, hospitals and providers are motivated to incorporate new ideas that could generate sustainable change in these areas of healthcare. Despite these recommendations,

literature review demonstrated a lack of training for providers regarding strategies to meet these benchmarks.

At baseline review of the hospital discharge process within a large academic health system, it was noted that although a discharge template was standardized, great variability took place within the grade level and readability scores of the discharge information being given to patients. This supports findings in the literature which demonstrate a wide range of grade-level and readability scores within discharge information (Choudhry et al., 2016), as well as an overall inconsistency within the discharge process (Buikstra, Strivens, & Clay-Williams, 2020).

Patients have the right to consistently receive healthcare information in a way they can understand, and providers have the right to receive education on how to provide this service to their patient populations. By prioritizing patient preferences and incorporating simple strategies, providers can make impactful changes to optimize patient comprehension and learning. This study investigated the effect of an educational intervention on hospital discharge information grade level and readability as well as the behavioral intentions of those writing the discharge information. This study lead to important findings within the areas of the CPD-Reaction Questionnaire, the Provider Self-Report Survey, and the Post-Intervention DIF Scores.

CPD-Reaction Questionnaire

The one construct within the CPD-Reaction Questionnaire (Légare et al., 2017) which demonstrated a statistically significant change, the *social influence* construct, consisted of three questions. These questions were "To the best of my knowledge, the percentage of my colleagues who will improve the readability of their DIFs is", "Now think about a co-worker whom you respect as a professional, in your opinion, will he/she improve the readability of their DIFs", and "Most people who are important to me in my profession will improve the readability of their

DIFs". The change in this area after the intervention demonstrates a strong belief among APPs that colleagues will incorporate a behavior change.

These findings support existing evidence because literature has demonstrated that "nurses, particularly advanced practice nurses, are socialized into a hierarchy that has implicit values and roles" (Waugaman & Lohrer, 2000) in which emulating and adopting the behaviors of respected peers is common (Felstead & Springett, 2016). If key leaders within the nursing hierarchy adopt a practice, it is much more likely for peers to incorporate these behaviors and sustain practice change. This is especially important when considering the demographics of this particular study group, which consisted primarily of advanced practice nurses very early in their careers. Transitioning to the advanced practice role can be a tumultuous time, and nurses often idealize experienced nursing mentors and seek to emulate their practice (Ferguson, 2011). By generating the belief that peers will change practice, this intervention becomes more likely to create sustainable change, and adds to the existing literature by demonstrating the importance of providers receiving this education early within their advanced practice role.

Although the only construct to demonstrate significant change was *social influence*, the remaining constructs of *behavioral intention, beliefs about capabilities, moral norm*, and *beliefs about consequences* each showed a mean increase post-intervention. An increase in the *behavioral intention* construct supports what is known, in that education can increase the likelihood of intending to adopt behavior change (Saddawi-Konefka et al., 2016). However, even a statistically significant change to this construct would be unlikely to generate true practice change, given the often-large gap between intention and action (Saddawi-Konefka et al., 2016). An increase in the *beliefs about capabilities* construct supports existing evidence, which demonstrates that receiving education about incorporating a behavior increases confidence in the

ability to incorporate the behavior (Terry & Cutter, 2015). An increase in the *moral norm*

construct also supports existing literature, in that increasing the belief that an action is morally

and ethically acceptable, makes it more likely to be adopted, especially within a medical

community in which moral and ethical standards are deeply engrained into education (Haddad &

Geiger, 2019). An increase in the *beliefs about consequences* construct supports the concept of

incorporating evidence-based practice, in that providers are more likely to integrate current best

evidence when they believe a behavior will be beneficial and helpful (Titler, 2008).

Provider Self-Report

No previous studies have been conducted in which providers self-report behavior changes

in the domains of incorporating patient preferences and improving the readability of discharge

information after an educational intervention, therefore these results add to what is known.

Providers self-reported a perceived improvement in both incorporating patient preferences and

improving the readability of their discharge information forms in a majority of clinical cases one

month after the intervention. Given that actual changed was demonstrated in the post-

intervention DIF scores, this study suggests that measuring self-report behavior changes may be

helpful for understanding subsequent behavior.

Post-Intervention DIF Scores

National benchmarks state that information provided to patients should be written at a 6th

grade level or below (Choudhry et al., 2016), however many available patient education

materials are written at a level that not only does not meet these standards, but are likely too

complex for a substantial portion of the population to comprehend (Badarudeen & Sabharwal,

2010). As seen on the initial DIF assessment, the Hospital Medicine Service within the health

system in which the intervention took place, was also far above meeting these benchmarks which

supports existing literature. Initial data demonstrated a mean DIF grade level of 9.5, which was 3.5 grade levels over the recommended levels. After the intervention, mean grade level dropped to 7.2, only 1.2 grade levels over the goal. Although the mean grade level scores did not meet the national recommendations of 6th grade or below, the post-test levels did surpass assessments completed by others, which frequently demonstrated discharge information written at college graduate reading levels or above (Choudhry et al., 2016). With repeated PDSA cycles and continuous provider education, it may be possible to meet national benchmarks within the Division of Hospital Medicine. Further research needs to be completed to determine if this education would be successful in other disciplines.

Many disciplines argue that the information that must be conveyed to patients is too complex to summarize within the national benchmarks, and that oversimplifying text can make the material too straightforward to convey necessary information (Badarudeen & Sabharwal, 2010). In contrast to this viewpoint, several studies have demonstrated that improving the readability of patient information leads to improved patient outcomes (Badarudeen & Sabharwal, 2010). The findings of this study support that the 6th grade benchmark may be unattainable with current methods and resources. The question of whether patients fully comprehend the key facts within text written at a 6th grade level needs to be explored. Other aspects that need to be explored within the institution include whether DIFs written at a 6th grade level improve post-hospital follow up adherence, as was demonstrated by Marcentoni, et al. (2015), and whether a benefit could be found by creating disease-specific instructions templates written at a 6th grade level (Mueller et al., 2015).

In the local health system in which the intervention took place, some social workers screen patients for the highest educational grade level attained in their admission assessments.

However, the problem with this approach is that patients typically demonstrate reading levels of five full grades lower than their highest attained educational grade (Badarudeen & Sabharwal, 2010). The average resident of the United States reads at an 8th grade reading level, and the average Medicare beneficiary reads at a 5th grade reading level (Stossel, Segar, Gliatto, Fallar, & Karani, 2012). Given these facts, and the general mismatch between patient reading skills and the readability of health information, some interventions aimed at improving written health information have focused on screening individual patients for reading levels using tools such as Rapid Estimate of Adult Literacy in Medicine (REALM), Test of Functional Health Literacy in Adults (TOFHLA), or Newest Vital Sign (NVS) (Badarudeen & Sabharwal, 2010). Further research needs to be done on creating a combined approach consisting of assessing literacy level and delivering tailored materials based on this assessment in order to facilitate truly patient-centered care.

While the grade level and readability scores did improve significantly, there are still substantial areas for improvement within the discharge process. For example, providers are attempting to incorporate patient preferences by placing medication information first within the discharge information section. However, when the actual discharge packet is printed by nurses, the discharge information section is imbedded within numerous pages of auto populated text containing information that is redundant and not applicable to many patients. Furthermore, strategies demonstrated to improve understanding of discharge instructions and patient satisfaction such as the teach-back method (Burke, 2018), "do not disturb signs" (Polster, 2015), and a patient navigator (Kwan et al., 2013), are not utilized consistently by nursing staff within the institution. Although this project focused on improving the readability of discharge

information content, health systems should consider multiple strategies to improve all aspects of the discharge process.

Limitations

The main limitation of this study is the small sample size of participants. A power analysis demonstrated that for future PDSA cycles, at least 34 participants would be ideal. However, at the time of this study, there were only 16 Hospital Medicine APPs employed by the health system, and only 10 were available for study participation. It also needs to be considered that despite the small sample size, a statistically significant change was achieved, meaning that more outcomes could have achieved statistical significance with a larger sample size.

Another limitation of this study is that the educational intervention was only administered to 10 out of the 16 Hospital Medicine APPs. This means that the post-intervention DIFs surveyed were created by a combination of both APPs who did and did not receive the education. Therefore, the total effect size was diluted, and the true effect size was likely even more substantial than what was represented within the data.

Another limitation is the use of one tool to check both grade level and readability of discharge information. Numerous applications utilize different mathematical equations to calculate these factors. Criticism is drawn because these tools work under the assumption that longer words and sentences equate to increasing complexity, the fact that the tools are unable to assess the active role of the reader, and the fact that different formulas can generate vastly different results for the same text (Agency for Healthcare Research and Quality, 2015). Given these factors, the Flesh-Kincaid tool was chosen because it is widely regarded as the most popular and accurate of these applications.

Conclusion

The APP education proved to be a useful intervention in improving discharge communication grade level and readability, substantially contributing to existing literature. A significant change was made to APP social influence beliefs, their self-reported behavior change, and DIF grade level and readability scores. Continued education and PDSA cycles are needed to ensure sustainability of the demonstrated practice change in an environment that can be subject to high staff turnover. Further research needs to be done utilizing alternative patient populations and larger sample sizes to determine if improved readability correlates to decreased hospital readmissions.

Providers responsible for creating patient discharge information should be equipped with the knowledge of how to write literacy level appropriate materials. It is the responsibility of the health system to provide this education. Considering the results of this quality improvement project, there is an opportunity to improve discharge information readability through inpatient provider education.

Appendix A

Patient Perceptions of Relative Importance of Discharge Elements (PRIDE) Study

We are requesting your participation in a research survey to understand how you value various components of the discharge information (or paperwork) you receive. This survey will help us to determine which component of the discharge information is most important to our patients. The survey will take approximately 3 to 5 minutes of your time. We anticipate no risks to you if you participate in this study. Your participation in this survey is completely voluntary. If you choose to take the survey, but do not wish to complete it, you can stop at any time. Your decision to participate in this survey will not affect your care. All collected information will be kept strictly confidential and will be stored in a secure manner. We will not share any individual's data and only summary results from this study will be used for publication.

There is no compensation for the completion of this survey. If you have any questions, you can contact the primary investigator, Dr. Rehan Qayyum at 804-628-3624. You must be at least 18 years of age or older to participate in this study. By beginning this survey you indicate your consent for participation.

We thank you for your participation!

Directions: There are 7 categories listed below, one of which is listed as "other". Please rank the categories from # 1 to # 7 (with #1 being the most important and # 7 being the least important to you). Each number from 1 to 7 should only be used once. You can use the "other" category to include things that you feel should be included, but wasn't mentioned here.

Medications   Rank:_____
(What medications to take and how to take them?)

Summary of Hospital   Stay   Rank:_____
(Why you were hospitalized and what was done during your hospital stay?)

Specific Instructions for Your   Disease   Rank:_____
(Such as checking your blood pressure, blood glucose, weight, etc.)

Activity/Diet   Restrictions   Rank:_____
(What physical activity to do or what foods to avoid?)

When to call 911/   **Doctor** Rank:_____

(Symptoms that should prompt a call to 911 or your primary doctor)

Follow-up   **Appointments**Rank:_____

(When, where, and who you will be seeing after discharge?)

Other _____   Rank:_____

Age:_____ *(Please use 89 if you are older than 89 years)*

Race (circle one):

African American   Caucasian   Hispanic   Other

Gender (circle one):   Male   Female

Education Level (circle one): None   Elementary School   Middle School   High School

College   Post-graduate

Number of Home Medications:_____

Number of Medication Changes at Discharge:_____

Discharge Disposition (circle one):

Home   Nursing Facility   Hospice   Rehabilitation

Long term acute care center   Other

Medical Conditions (circle all that apply):

Diabetes Mellitus

Hypertension

Heart Failure

Chronic Kidney Disease

COPD
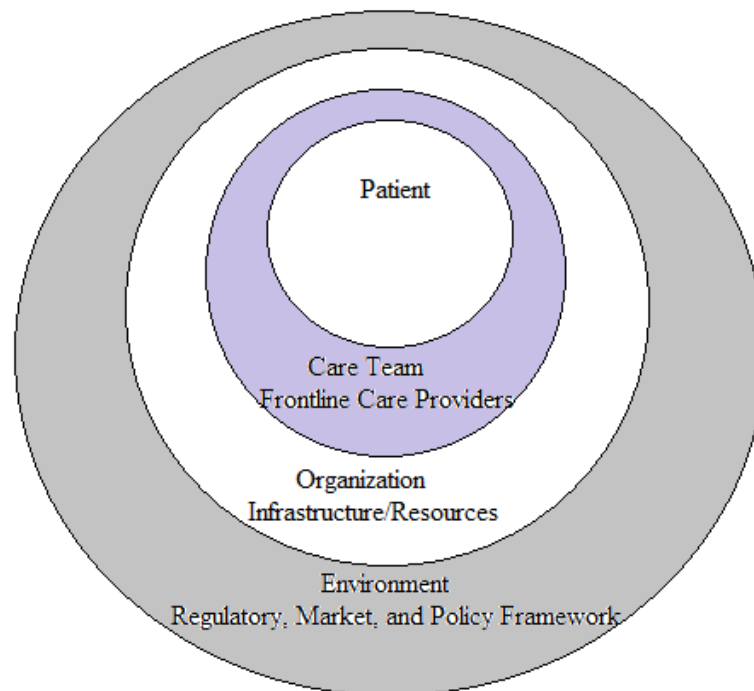
Asthma

Tobacco Use

List any other conditions here:

_____

_____

_____

_____

Appendix B

(Ferlie & Shortell, 2001)

Appendix C

Dear Hospital Medicine Advanced Practice Providers,

At the end of the upcoming APP Staff Meeting I will be performing a brief educational

intervention for the group to disseminate both the results of the PRIDE study and the results of

our average DIF grade level scores. I will also share some strategies to make our DIFs more

patient centered and readable. I will ask you to perform a brief survey before and after the

educational session as part of a research project. Participation in this research is entirely

voluntary.

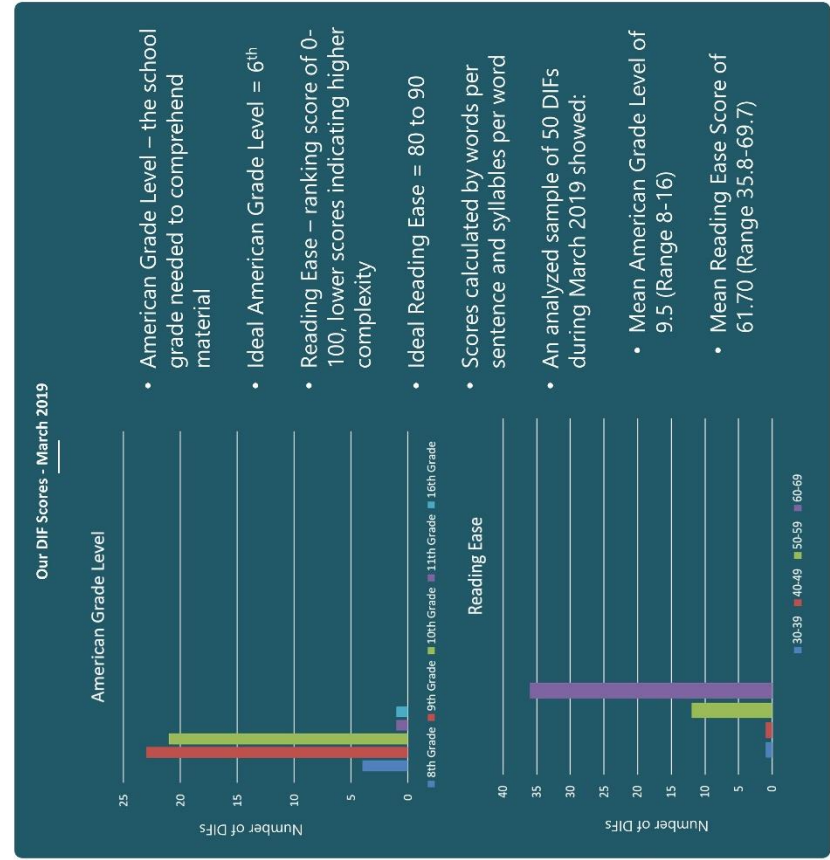Thank you in advance for your attendance and participation!

Appendix D

Improving Readability of Discharge Instructions

JMU School of Nursing

Amber Balzer, MSN, APRN, CMSRN, AGACNP-BC

Erica Lewis, RN, PhD

Abstract

Patient instructions should be written at or below a 6th grade reading level. Our reading levels are too high. In order to change this, we need to change the way we word what we write in our Discharge Instruction Forms (DIFs). Practical suggestions are made for how we can improve. Small changes can make a big difference, keeping our patient's safe and helping them to avoid readmission. We will know we succeed if screening of DIFs reveals decreased grade level, increased readability scores, and if providers self-report behavior change post-intervention.

Background

- According to the National Institute of Health, all patient instructions should be written at or below a 6th-grade level to help prevent readmission. Yet, nationwide most discharge instructions are written at college graduate reading level (Choudhry, et al, 2016).

- In the PRIDE study, our patient's ranked medication instructions as the most important discharge element.

- Despite being responsible for over 19% of total health system discharges, our division's current DIFs lack individualization and our DIF literacy level was previously unknown.

- Our health system readmission rate is approaching 16%.

Our DIF Scores - March 2019

American Grade Level

(chart: Number of DIFs vs American Grade Level — 8th Grade, 9th Grade, 10th Grade, 11th Grade, 16th Grade)

Reading Ease

(chart: Number of DIFs — 30-39, 40-49, 50-59, 60-69)

- American Grade Level – the school grade needed to comprehend material
- Ideal American Grade Level = 6th
- Reading Ease – ranking score of 0-100, lower scores indicating higher complexity
- Ideal Reading Ease = 80 to 90
- Scores calculated by words per sentence and syllables per word
- An analyzed sample of 50 DIFs during March 2019 showed:
  - Mean American Grade Level of 9.5 (Range 8-16)
  - Mean Reading Ease Score of 61.70 (Range 35.8-69.7)

Action Steps

- Include the most important information first (CDC)

  State actions to take
  Say why it's important

- Limit the number of messages

- Focus on what the patient needs to know
  Skip excess details
  Avoid lengthy lists
  Use bullets instead of commas

- Choose words carefully

  Use words with 1-2 syllables
  Use sentences with 8-10 words
  Paragraphs should be only 3-5 sentences

- Limit jargon and technical terms

- When possible, word things in the positive

  Saying what patients should do instead of saying what they should not do

- Use bold to emphasize importance, avoid all caps, italics, and underlines

How will we know if we are successful?

- Repeat screening of DIFs reveals decreased grade level
- Repeat screening of DIFs reveals increased reading ease
- Providers self-report behavior change

Appendix E

I am requesting your participation in a research study to help determine your behavioral intentions surrounding the discharge process, and if a change in behavioral intention can take place. The research activities include:

1) The researcher will assess a random sample of DIFs for readability and grade level
2) Participants will complete a behavioral intention survey before an educational intervention
3) The researcher will present participants with an in person educational intervention focused on improving patient satisfaction with the DIF by incorporating prioritized patient preferences and making the DIF more readable by utilizing appropriate literacy levels
4) Participants will complete a behavioral intention survey after the educational intervention
5) The researcher will then assess a random sample of DIFs for readability and grade level
6) One month after the intervention the researcher will interview participants about practice Change

The surveys and interviews will take approximately 3 to 5 minutes of your time, and the educational intervention will take approximately 15 minutes of your time. I anticipate no risks to you if you participate in this study. Your participation in this study is completely voluntary. If you choose to take the survey, but do not wish to complete it, you can stop at any time. All collected information will be kept strictly confidential and will be stored in a secure manner. I will not share any individual's data and only summary results from this study will be used for publication.

There is no compensation for the completion of this study. If you have any questions, you can contact the primary investigator, Amber Balzer at 804-297-5294. By beginning this survey, you indicate your consent for participation.

Thank you for your participation!

Directions: Please answer each of the following questions by indicating the number that best describes your opinion about the behavior indicted. Some of the questions may appear to be similar, but they do address somewhat different aspects of the behavior stated.

1. I intend to improve the readability of my DIFs: Strongly disagree   Strongly agree
                                                      [1]   [2]   [3]   [4]   [5]   [6]   [7]

---

2. To the best of my knowledge, the percentage of my   0-20% 21-40% 41-60% 61-80% 81-100%
colleagues who will improve the readability of their DIFs is: [1]   [2]   [3]   [4]   [5]

---

3. I am confident that I could improve   Strongly disagree   Strongly agree

the readability of my DIFs if I wanted to:		[1]	[2]	[3]	[4]	[5]	[6]	[7]

4. Improving the readability of my DIFs
is the ethical thing to do:

	Strongly disagree						Strongly agree
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

5. For me, improving the readability
of my DIFs would be:

	Extremely difficult						Extremely easy
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

6. Now think about a co-worker whom you
respect as a professional, in your opinion,
will he/she improve the readability of their DIFs?

	Never						Always
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

7. I plan to improve the readability of my DIFs:

	Strongly disagree						Strongly agree
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

8. Overall, I think that for me improving
the readability of my DIFs would be:

	Useless						Useful
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

9. Most people who are important to me in my
profession will improve the readability of their DIFs:

	Strongly disagree						Strongly agree
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

10. It is acceptable to improve
the readability of my DIFs:

	Strongly disagree						Strongly agree
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

11. I have the ability to improve
the readability of my DIFs:

	Strongly disagree						Strongly agree
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

12. Overall, I think that for me improving
the readability of my DIFs would be:

	Harmful						Beneficial
	[1]	[2]	[3]	[4]	[5]	[6]	[7]

Demographics:

Age: [25-34]   [35-44]   [45-54]   [55-64]   [65-74]

Gender: [Male]   [Female]   [Other]

Race: [Caucasian]   [African American]   [Hispanic]   [Other]

Years Practicing as Registered Nurse: [1-5]   [6-10]   [11-15]   [16-20]   [21 or more]

Years Practicing as Nurse Practitioner: [1-5]   [6-10]   [11-15]   [16-20]   [21 or more]

Appendix F

<u>Directions</u>: Please answer each of the following questions by indicating the response that best describes your practice.

1. In the last month I have increased the readability of my DIFs:	Strongly disagree [1] [2] [3] [4] [5]	Strongly agree [6] [7]

2. The percentage of clinical cases in which I improved the readability of my DIFs:	0-20% [1]	21-40% [2]	41-60% [3]	61-80% [4]	81-100% [5]

3. In the last month I have incorporated patient preferences in my DIFs:	Strongly disagree [1] [2] [3] [4] [5]	Strongly agree [6] [7]

4. The percentage of clinical cases in which I incorporated patient preferences in my DIFs:	0-20% [1]	21-40% [2]	41-60% [3]	61-80% [4]	81-100% [5]

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