Process Development for Measuring Social and Behavioral Determinants of Health in the Inpatient Setting: A Feasibility Study

By

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Dedication

To my husband, who gifted me this opportunity of a lifetime. Fan blade, my love.

Abstract

Problem: Social and behavioral determinants of health (SBDH) are the conditions, in which children, youth, and families are born, grow up, live and work, as well as the quality and accessibility to health care. SBDH strongly influences health, and the development and management of chronic disease. Increasingly, they are recognized as a key factor in population health management analytics and value-based care as they help identify at-risk individuals and assist providers in implementing timely interventions. SBDH deficits often interfere with patient's ability to maintain and improve their health post-discharge; hence, the assessment and use of SBDH are important inpatient activities, to support transitions of care in which nursing will play a key role. To date, SBDH assessment has been largely conducted and tested in ambulatory healthcare settings versus inpatient; consequently, the SBDH deficits have not been routinely assessed or documented in the electronic health record (EHR) nor used during the inpatient admission to prepare patients for discharge.

Project Aim: The purpose of this project was to 1) develop the procedures and methods to implement a standardized nursing process of SBDH assessment within the acute care setting, and 2) assess the feasibility of incorporating an SBDH assessment in an inpatient care unit.

Project Method: This exploratory descriptive study utilized quantitative and qualitative methods to examine the feasibility of SBDH assessment and data capture in an inpatient setting (The University of Kansas Health System). The PRAPARE assessment tool was selected for this project as it aligns with national initiatives prioritizing SBDH. Initial pilot data were collected during a three-month period with the goal of assessing 30 patients prior to discharge. Process feasibility was examined using three methods of PRAPARE data assessment by monitoring the time required to complete the assessment including, (1) patient self-assessment and data entry via

REDCap, patient self-assessment using pen and paper, and RN interview and data entry via primary investigator interview. Resource feasibility explored patient willingness, comfort, and satisfaction with the PRAPARE assessment process. Patient interviews were recorded, transcribed, and analyzed using NVivo software and classical content analysis. Data were analyzed using descriptive statistics performed using SPSS software. Similarities and differences between group themes are described.

Project Results:

A total of 44 patients participated in the study. Fifteen patients were assigned to the REDCap study arm, 15 patients were assigned to the RN interview study arm, and 14 patients were assigned to the pen & paper study arm. All 44 patients participated in the feasibility assessment following the completion of the PRAPARE assessment tool. Through administration of the PRAPARE assessment tool, it was discovered that the most frequent social needs among CF patients were transportation (20.4%), followed by healthcare - medical, dental, mental health, vision (15.9%), and utility (13.6%). All three methods of PRAPARE assessment tool administration proved to be feasible for inpatient workflow with overall education to completion time ranging from 5-10 minutes. All three methods of administration (REDCap, RN interview, and pen & paper) received positive feedback from respondents. However, differences in administration method (RN administered versus electronic self-administered) did result in a variation on the impact of time commitment from the RN.

Conclusions:

SBDH deficits often interfere with patient’s ability to maintain their health post-discharge. This study has illustrated that slowing the problem of growing readmission rates and increased inpatient utilization may, in fact, lie with addressing SBDH. Designing the nursing workflows to include these assessments will require nurses in various roles – both clinical and administrative - to advocate for the needs of patients and to be innovative in the application of these assessment tools.

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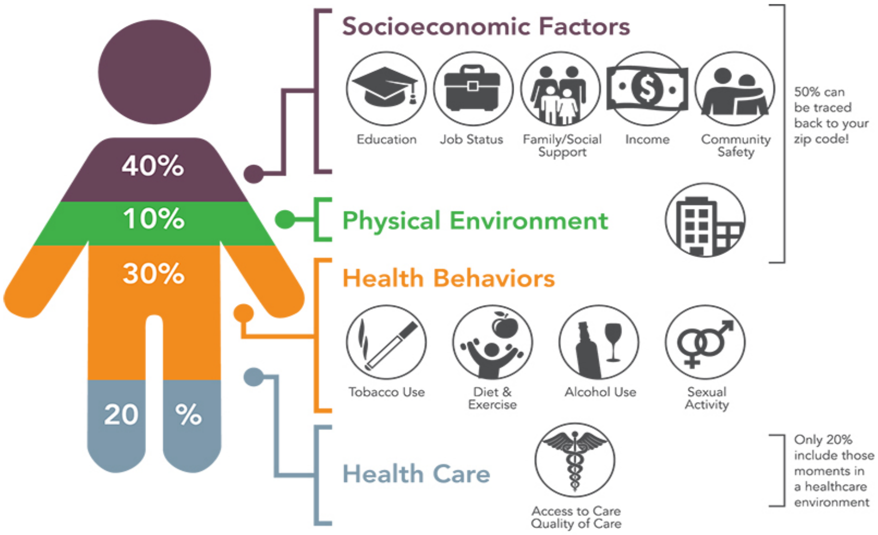
Process Development for Measuring Social and Behavioral Determinants of Health in the Inpatient Setting: A Feasibility Study

Social determinants, the conditions where people live, work, and play have a strong effect on health (Centers for Disease Control and Prevention [CDC], 2018). Safe housing, neighborhoods, and relationships; access to food markets, education, economic job opportunities, health care; built environment opportunities, social support, norms, and attitudes - all these are considered social and behavioral determinants of health (SBDH) (Centers for Disease Control and Prevention [CDC], 2014). Figure 1 displays some of the various SBHD and their relationship to individual health (Oostra, R., 2019, figure 1).

Figure I: Social and Behavioral Determinants of Health



Source: Institute for Clinical Systems Improvement, Going Beyond Clinical Walls: Solving Complex Problems (October 2014)

A significant relationship exists between the development and management of chronic conditions and SBDH (Hill, Nielsen, & Fox, 2013). Social and behavioral determinants can be more deeply impactful on overall health than genetics (CDC, 2014). Their impact is so great that the Institute of Medicine (IOM) has called for clinicians to make these determinants and care delivery processes a research priority (Institute of Medicine [IOM], 2012). Healthy People 2020 has highlighted addressing SBDH as “one of the four overarching goals of the decade,” (2019).

Determinants such as access to healthy food, safe housing, education, and transportation, have long been of concern to public health professionals, but have not traditionally been a focus of inpatient care providers. As knowledge surrounding SBDH's impact on overall health and mortality continues to grow, this attitude is beginning to change. Organizations are beginning to recognize that value-based care hinges on addressing social and behavioral determinants (Watson Dillon & Mahoney, 2015). Inpatient nurses, in particular, are situated in a unique position to be able to assess and mitigate the negative impacts of SBDH. The nursing profession, due to its focus on caring relationships and on the interrelatedness of patient, family, and community, positions nurses as some of the best equipped to lead in the reduction of health disparities (Wetta, 2017).

Despite the information stated previously, the United States continues to spend more money on clinical care than reforming social and behavioral care as compared to other high-income nations whose health outcomes out-perform the U.S. (Adler, Glymour, & Fielding, 2016). Literature suggests that there are many socioeconomic conditions, which are the underpinnings of the health inequalities patients are facing (Adler et al., 2016). Combatting these inequalities will require a combination of action on health-improving social policy and shifting of health financing toward improvement in population health (Adler et al., 2016; Fawcett & Hall Ellenbecker, 2015).

Statement of Problem

There are many competing priorities in today's healthcare delivery landscape. Doctorly prepared nurse leaders are being charged with developing strategies to align with the Institute for Healthcare Improvement's Quadruple Aim: Improving the patient experience of care; Improving the health of populations; and Reducing the per capita cost of health care (Institute for Healthcare Improvement [IHI], 2019). The doctorly prepared nurse leader is educated and capable of advocating for the patient and the healthcare needs of the population and community. An important part of this advocacy work is assessing gaps in community health needs. Unaddressed SBDH needs are increasingly being quantified by organizations that are seeking to better understand how to remain profitable within a value-based care system. For example, 30-day readmissions are one quality metric that organizations monitor to impact unaddressed SBDH needs.

The University of Kansas is a nationally recognized Cystic Fibrosis (CF) program which treats patients from across the Midwest. As the nurse manager of BH15, the adult CF unit at the University of Kansas Health System (TUKHS), the author has identified inpatient readmissions as a challenge impacting the entire organization. Frequently, nursing staff on the unit escalate concerns about patients being homeless, not having money for food, to purchase medications, or having no transportation to medical appointments. These issues often go unaddressed at discharge because there is not a formal investigation into the patient's social and behavioral needs. In the current state, a patient is admitted to the hospital and treated for their medical condition. The patient then discharges home, but their SBDH needs trump their medical care and the patient returns to the hospital less than thirty days from discharge.

To capture patient's social and behavioral needs, such as access to food and healthcare, this project implemented the PRAPARE assessment tool during the inpatient admission for participating patients. The PRAPARE tool is based on existing social risk assessments. The tool aligns with initiatives such as Healthy People 2020, measures proposed under the next stage of Meaningful Use, ICD 10 clinical coding, and health center's Uniform Data System (National Association of Community Health Centers [NACHC], 2019). The assessment tool is a 21-question document that includes determinants such as: financial stability, food access, housing, safety, access to childcare, access to health care, and health knowledge. The tool integrates within several electronic health record (EHR) systems; however, EPIC is the EHR vendor for The University of Kansas Health System and will be used for this study. Additionally, the National Association of Community Health Centers (NACHC) has developed a support website with training videos and an implementation and action toolkit that focus on point of care interventions.

Appendix A outlines the four main domains assessed by PRAPARE and the individual determinants included within each domain. PRAPARE assesses four domains: 1) Sociodemographic, 2) Psychological, 3) Behavioral, and 4) Individual-level social relationships. The sociodemographic domain includes the subdomains of race, ethnicity, employment, and financial resource strain. Stress and social connection/isolation are subdomains of the psychological domain. The behavioral domain includes exposure to violence subdomain. The individual-level social relationships domain includes the subdomains of incarceration, military status, refugee status, and migrant farmworker status.

When focusing on population health management, the doctorly prepared nurse leader must look more broadly than a hospital-centric viewpoint. This is often quite contrary to what hospital leaders are conditioned to do, which is to maintain health and prevent inpatient hospitalization. This is a large paradigm shift from the traditional medical model that healthcare organizations are still struggling to embrace. The doctorly prepared nurse leader should understand the relevance of social and behavioral determinants of health and ensure that this data is communicated and interpreted to other healthcare leaders (Watson Dillon & Mahoney, 2015). By partnering with other disciplines, outside organizations and public health agencies, doctorly prepared nurse leaders have the ability to advocate for improved health outcomes for patients and improved outcomes of our healthcare systems at the system, state and federal level (Watson Dillon & Mahoney, 2015).

These concepts of doctoral leadership are demonstrated in the purpose of this project. The doctoral student has identified patient's SBDH needs, worked with the care team to link patients with resources through The University of Kansas Health System and the community to provide enhanced patient health outcomes while helping the health system avoid unnecessary costs related to unmanaged SBDH.

Project Aims

This quality improvement project consisted of two aims: (1) to develop the procedures and methods to implement a standardized nursing process of SBDH assessment and capture within the acute care setting, and (2) to assess the feasibility of incorporating a SBDH assessment in an inpatient care unit.

Project Questions

I. Which SBDH are observed most frequently among cystic fibrosis patients admitted to BH15?

II. Can the feasibility of assessing SBDH be demonstrated in an inpatient setting:

   a. The time needed to complete the assessment
   b. Completeness of assessment
   c. The comfort of the patient and practitioner with administering and completing the assessment

Definitions

Conceptually, SBDH are defined as a wide range of personal, social, economic, and environmental factors which influence an individual's health. Operationally, SBDH are assessed using the PRAPARE 21-question assessment instrument which allows healthcare providers to identify determinants affecting patient health.

Cystic Fibrosis is a progressive, genetic disease that causes persistent lung infections and limits the ability to breathe over time (Cystic Fibrosis Foundation [CFF], 2019) and often requires inpatient hospital admission.

Time will be operationally measured in seconds, in a framework and have a beginning and end point. Conceptually, "Time" was defined as the patient's perceived amount of valued personal moments devoted to a task (Merriam-Webster, 2019). There were two aspects to the "Time" assessment. 1) The RN rating of how long it took to explain the assessment to the patient and 2) the participant rating of how long the assessment took to complete. The respondent and RN will rank "Time" on a 5-point Likert scale.

Completeness was operationally defined as all assessment questions being answered thoroughly and no answer fields left blank. Conceptually, “Completeness” is a quality of being whole or perfect, with nothing missing (Merriam-Webster, 2019). In this study, participants were given the option of selecting “I choose not to answer this question” for each assessment question. For example, out of 44 participants, 2 participants (4.5%) did not answer the question. Therefore, completeness for the question was 95.5% (n=42).

Comfort will be operationally defined as free from grief, distress, pain, or constraint (Merriam-Webster, 2019). Conceptually, “Comfort” will be defined as the patient and/or practitioner possessing a feeling of being respected by the individual or the process. A feeling of safety, support and being cared for. The perception of comfort will be ranked by the respondent on a 4-point Likert scale.

Theoretical Framework

The Donabedian Model (Donabedian, 2005) was used as the theoretical framework to guide this project. Donabedian’s model is commonly utilized to measure healthcare quality because Donabedian was able to show that structure measures have an effect on process measures, and process measures have an effect on outcome measures. Structure measures reflect the “physical and organizational characteristics where the healthcare occurs” (National Health Service [NHS], n.d.). Process measures in the Donabedian model “focus on the care delivered to the patient,” (NHS, n.d., figure 1) such as medical services and treatments. Donabedian’s outcome measures look at the “effect of healthcare on the status of patients and populations,” (NHS, n.d., figure 1).

In this study, the structure measures are the attributes of the PRAPARE assessment tool and how it is being administered – Patient Entry (REDCap), RN Interview, or Pen & Paper. Process measures are reflected by the feasibility study on Time, Completeness, and Comfort of the patient and practitioner. Outcome measures reflect the impact on patient and clinician satisfaction with the assessment process and demonstrate if the project has achieved its goal to aid clinicians in the identification of patient's SBDH needs in order to improve their chances of maintaining health post-discharge.

Measurement for improvement has an additional component called balancing measures. Balancing measures "reflect unintended and/or wider consequences of change that can be positive or negative," (NHS, n.d., p. 1). It is important to be aware of balancing measures during the improvement process and to attempt to reduce their impact, if necessary. Donabedian believed that outcome measures were the 'ultimate validators' of effectiveness and quality, but he recognized that process measures were essential to knowing if care had been 'properly applied' and creating the behavioral change necessary to achieve the outcome (Donabedian, 2005).

Literature Review

Impact of Social and Behavioral Determinants of Health (SBDH) on Health

While many health programs focus on the delivery of healthcare, growing bodies of research are now pointing to non-healthcare related factors as the largest influencers of health (The National Organization of State Offices of Rural Health [NOSORH], 2017). Current research highlights that as much as 50% of the influence on an individual's health comes socioeconomic or environmental factors; followed by health behaviors at 30%; and an individual’s healthcare at 20% (Kindig & Isham, 2014). There are many SBDH’s which have the opportunity to either improve or cause harm to an individual. The four selected for this paper are a small sampling of SBDH which have been selected to provide a focal point for the impacts of SBDH on health.

Housing. Scientific evidence continues to mount showing that low-quality or inadequate housing can pose risks to health. Such risks may include air pollutant-related respiratory and cardiovascular disease, temperature-related injury/death, the spread of communicable diseases, and injuries occurring in the home. The state of Kansas currently has over 2,000 homeless individuals (Spotlight on Poverty & Opportunity website, 2019). Additionally, there are 34,000 households receiving federal rental assistance, and 40,265 households on the low-income home energy assistance program (LIHEAP) (Spotlight on Poverty & Opportunity website, 2019). More than 30.0% of working Kansas families are living under 200% of the poverty line (Spotlight on Poverty & Opportunity website, 2019). The neighboring state, Missouri, has 6,000 homeless; 96,000 households receiving federal rental assistance, and 135,638 households on LIHEAP. Nearly 32.0% of working families in Missouri are living under 200% of the poverty line (Spotlight on Poverty & Opportunity website, 2019).

Transportation. Lack of transportation can have a significant effect on health and the ability to make healthy lifestyle choices. Access to transportation impacts an individual’s decisions about physical activity, access to healthcare, ability to purchase healthy foods, and access to steady, good-paying jobs (Tranportation.gov website, 2019) These statements are particularly true for people who live in rural areas without access to public transportation to help meet their needs. The US Department of Transportation ranks Kansas residents within the 75th percentile in proximity to major roadways, but only 20% of residents who commute do so by personal vehicle or public transit (2019). Missouri ranks at approximately the 60th percentile in proximity to major roadways, and 26% of residents commute using a personal vehicle, while 33% utilize public transit (Transportation.gov website, 2019).

Education. Educational attainment has the potential to have greatly positive impact on an individual's health. Literature has shown that those with less education are less likely to receive health screens or seek preventative services. These individuals are more likely to engage in unhealthy behaviors such as smoking, lack of exercise, and unhealthy eating habits. Individuals with less education also have higher risks for hospitalization and poorer health status overall (NOSORH, 2017). Higher education can be linked to healthier behaviors, improved health outcomes, and increased life expectancy (Zimmerman, Woolf, & Haley, 2015). The benefits of educational attainment can be viewed from a kind of "upstream" and "downstream" perspective (Zimmerman, Woolf, & Haley, 2015). The downstream benefits of education are most profound at the individual level – the skills the education imparts on the individual; the increase in economic and social resources; and the impact that education has on personal health behaviors (Zimmerman, Woolf, & Haley, 2015)**.** The upstream benefits are more subtle and play out over the course of the individual's lifetime (Zimmerman, Woolf, & Haley, 2015)**.**

Food Insecurity. Limited access to healthy food can have many drivers. Income, physical accessibility, and cultural conditioning all affect food security (Cooksey-Stowers, Schwartz, & Brownell, 2017). In 2017, 11.8% of households nationwide were food insecure. These numbers have continued to decline from 2011 when they had reached an all-time high of 14.9% (Cooksey-Stowers, Schwartz, & Brownell, 2017). The 11.8 % (15 million) food insecure households with low to very low food security reported having difficulty at some time during the year providing enough food for all of their family members (Coleman-Jensen, Rabbitt, Gregory, & Singh, 2018). Households with children led by single women experience food insecurity at 2.5 times the average household rate (Feeding America, 2018). Many communities are also frequently faced with the challenge of "food deserts", meaning that people may be able to afford healthy food, but it is not physically available to them (Cooksey-Stowers, et al., 2017). Food deserts are known to occur in both rural and urban locations.

With healthcare having only a 20% impact on an individual's overall health, this leaves healthcare providers, who have a vested interest in the prevention of illness and disease, at a loss. In order to truly treat patients, healthcare providers must look beyond the walls of hospitals, clinics, and doctor's offices. Healthcare providers must find a way to engage in the health of their patients at the community level. Literature suggests that interventions, particularly in the SBDH areas of housing, income support, nutritional support, and care coordination have a positive impact on patient health outcomes (Taylor et al., 2016). Additionally, program evidence from these studies have shown that when working with lower-income populations, healthcare providers do best to join with community partners such as housing authorities, food banks, and schools when targeting determinant interventions (Taylor et al., 2016). Data from studies conducted to reduce health inequities reaching back to the 1960's and 1970's show that health disparities are not inevitable. By taking action to reduce social disadvantage, healthcare providers and policymakers are simultaneously reducing gaps in the health and increasing the longevity of the population (Thornton et al., 2016).

Community Level SBDH Measures and Community Health Outcomes

As referenced in Figure 1, healthcare alone does not dictate health. The physical environment and community-level conditions where the individual lives, works, and plays are the true indicators of patient health outcomes (Forum, 2019). To address patient needs, will require collaboration between providers and community leaders, data gathering, and information sharing. Once needs are assessed, partnerships within healthcare and the community at-large should be formed to address concerns (Forum, 2019). Ongoing research and measurement will be required to ensure that programs are effective and continue to meet the needs of the community.

Leveraging demographic data from TUKHS Cystic Fibrosis (CF) program's, "CF Fundamentals Learning and Leadership Collaborative 2", (FUN LLC2) there is an ability to analyze the health outcomes and health factors relative to those of other individuals with CF in the same geographic area. These data are utilized by TUKHS to gage the effectiveness of programs and treatments within the TUKHS CF community.

The "County Health Rankings and Roadmaps" program is sponsored by The Robert Wood Johnson Foundation and allows for the comparison of health of patients across the state and between states (The Robert Wood Johnson Foundation, 2018). This information provides an overview of environmental impacts on health. Within the Rankings and Roadmaps data, the "health outcomes" rank represents how healthy a county is in comparison to others within the state. This ranking is based on two types of measures: how long people live and how healthy people feel while alive (The Robert Wood Johnson Foundation, 2018). "Health factors" are a representation of SBDH influences on a county. This ranking is an estimate of future health comparison. Health Factors are based on four types of measures: health behaviors, clinical care, social and economic, and physical environment factors (The Robert Wood Johnson Foundation, 2018). Gaining a deeper understanding of the challenges faced by patients simply due to their health factors can lead to enhanced use of hospital and community resources to achieve better health outcomes.

Impact of SBDH Outcomes on Health Care System Costs

While there are a myriad of impacts of unaddressed SBDH to both patients and health systems, one of the easiest to quantify is hospital readmissions. In 2014, the Agency for Healthcare Research and Quality calculated that nationally, hospitals spent in excess of $41.3 billion between January and November 2011 to treat patients readmitted within 30 days of hospital discharge (Shinkman, 2014). Of these readmissions, 1.8 million were Medicare patients whose readmissions cost the system $24 billion; there were 600,000 privately insured readmissions with charges of $8.1 billion; and 700,000 Medicaid patient readmissions which ultimately cost hospitals $7.6 billion (Hines, Barrett, Jiang, & Steiner, 2014). The problem is so dire that the Centers for Medicare and Medicaid Services (CMS) has instituted the “Hospital Readmissions Reduction Program” and has fined organizations for having too many patients who return within 30 days of discharge for additional treatments. For fiscal year 2015, CMS fines of underperforming hospitals hit $428 million dollars (Kauffman, 2016). According to CMS data for 2016, of over 3,400 hospitals, only 799 had 30-day readmission rates low enough to avoid fines (Centers for Medicare and Medicaid Services [CMS], 2016).

Currently TUKHS is tracking over 274 patients since mid-October 2018 who have been admitted five or more times in the last 365 days. These patients are referred to as Multi-Visit Patients (MVP’s). Of these 274 unduplicated patients, 206 (75%) were admitted through the emergency department (ED) (The University of Kansas Health System [TUKHS], 2019, slide 2). In the last 12 months, these 274 patients have accounted for 2,442 ED visits, and of those ED visits, 1,864 (76%) have resulted in inpatient hospitalizations (this data represents adult patients 18+, non-obstetric, medicine service, excludes chemo/radiation) (TUKHS, 2019, slide 2).

Characteristics of MVP's are well documented. While their numbers are small, five percent of inpatients, they account for 50% of readmissions. In addition, MVP's are known to have unmet needs, which include clinical, social and behavioral needs (TUKHS, 2019, slide 4). Patients with multiple readmissions generally experience poor health outcomes such as poor resolution of the admission concern, unstable therapy at discharge, and inadequate care post discharge (TUKHS, 2019, slide 4). These MVP patients place the health system at risk for CMS penalties related to reimbursement for delivered care (TUKHS, 2019, slide 5). This subpopulation impacts quality performance metrics such as readmissions, length of stay, and hospital acquired conditions, which threaten reimbursement (TUKHS, 2019, slide 5). Additionally, MVP's greatly inhibit the organization's ability to facilitate throughput and care delivery. Overall, MVP's contribute to a poor utilization of resources for the health system.

Within the inpatient cystic fibrosis program at TUKHS there are currently18 MVP's (The University of Kansas Health System, 2018). To be able to identify unmet needs driving utilization for these patients would give the organization a clearer idea of where it would be most beneficial to focus support efforts.

Utilization of SBDH Assessment Tool in the Inpatient Setting

In the current state, there is no formal assessment of patient SBDH needs occurring during the inpatient stay. There are some aspects of SBDH that may be gleaned during social work assessments, but these would only be encountered related to the patients' plan for discharge. The IOM recommends the use of standardized tools to assess patients for SBDH needs (2014). Mapping data to standardized coding within the electronic health record allows the information to be more widely available for analysis. There is no overarching SBDH needs assessment that takes a broader look beyond just getting the patient discharged to see what the healthcare provider and the organization can do to help keep the patient out of the hospital. The purpose of adding a robust SBDH assessment during the inpatient stay will be: 1) to identify health disparities impacting the CF population and 2) assess the feasibility of incorporating a SBDH assessment into the inpatient environment on a permanent basis. This would give practitioners the ability to achieve ongoing assessment of patient's SBDH needs and provide opportunity to address those prior to the patient's discharge in an effort to reduce preventable 30-day readmissions. When reviewing the literature, there was no existing SBDH feasibility assessment identified, thus a feasibility assessment was designed specifically for this study (Appendix B).

Methods

Design

This exploratory descriptive study was designed to assess the feasibility of administering a social and behavioral determinants of health assessment, specifically, the PRAPARE assessment, within the acute care setting. The study results will be used for nursing unit and organizational quality improvement. The study utilized a convenience sample of 44 patients divided into three study arms – the Patient Entry, RN Interview, and Pen & Paper arms. Patients were assigned to each study arm in an arbitrary fashion to provide three balanced groupings.

During the inpatient admission, the patient completed the PRAPARE assessment according to the assigned study arm. Patients assigned to the “Patient Entry” arm were provided with a tablet pre-loaded with the REDCap PRAPARE assessment for completion. Patients assigned to the “RN Interview” arm completed the PRAPARE assessment with the primary investigator (PI). Patients assigned to the “Pen & Paper” arm completed the assessment independently. Following the completion of the PRAPARE assessment, all patients in the study completed the feasibility assessment interview with the PI regardless of which study arm to which they were assigned.

Inclusion criteria for the study included:

- The patient must be an adult with the Cystic Fibrosis diagnosis age 18-74 years
- The patient must be admitted for an inpatient hospital stay
- The patient must be planning to discharge home

Exclusion criteria for the study included:

- Cystic Fibrosis patients on comfort measures
- Cystic Fibrosis patients discharging to locations other than their home

Setting

This project was conducted within BH15, the Adult Cystic Fibrosis and Medical Telemetry Unit at the University of Kansas Health System. BH15 is an 18-bed medical telemetry unit with diverse staffing of both licensed and unlicensed personnel. Nursing staff on this unit are specially trained in the care of the adult cystic fibrosis patient. In addition to the cystic fibrosis diagnosis, patients are often dealing with co-morbidities such as sepsis, cystic fibrosis-related diabetes, pancreatic insufficiency, liver/renal failure, pneumonia, and various antibiotic-resistant organism infections due to long-term antibiotic use.

Sample

The study design called for 10 patients per group, a total of 30 inpatient cystic fibrosis patients. A total of 44 patients were enrolled in the study. In the REDCAP arm there were 15 participants (34.1%), in the RN Interview arm there were 15 participants (34.1%), and the Pen & Paper arm enrolled 14 participants (31.8%).

Data Collection

At the time of inpatient admit, the PI approached patients who met inclusion criteria for participation in the project. Once the patient was consented, the PI administered the PRAPARE assessment (Appendix C). The PRAPARE assessment and the feasibility assessment (Appendix B) were administered during the inpatient admission. After the assessments were completed, all data were compiled.

Timeline

The timeline for data collection was 12 weeks, during which time the organized set of procedures was performed with verification and oversight at important stages (Appendix E). Quantitative data from the PRAPARE assessment, information such as time to complete, completeness of the assessment, and the SBDH deficits identified for the CF populations were analyzed using SPSS software. Resource feasibility will explore patient willingness, comfort, and satisfaction with the PRAPARE assessment process. Patient interviews were recorded, transcribed, and analyzed using classical content analysis.

Results and Data Analysis

Forty-four participants were assigned to one of the three study arms in an arbitrary manner. The REDCap and RN interview study arms each possessed 15 participants, and the pen and paper study arm contained 14 participants. All forty-four of the respondents participated in the feasibility assessment after completing the PRAPARE assessment tool according to their designated study arm.

Demographics

The majority (n=40) of participants in this study were White (90.9%), followed by 4.5% (n=2) African American, and American Indian 2.3% (n=1) as displayed in Table 1. Ethnic representation was predominantly non-Hispanic/non-Latino (95.5%) and English was the primary/preferred language by all participants. Gender representation was nearly equal, males represented 47.7% (n=21) of respondents and females 52.3% (n=23).

Education and Employment

Table 1 reveals the majority of participants (n=31) reported possessing more than a high school education (70.5%), followed by 22.7% reporting a high school diploma or GED (n=10), and 6.8% reporting less than a high school education (n=3). Employment status among participants was varied with 36.4% reporting unemployment and not seeking work, 34.1% reporting full-time employment, 15.9% work part-time, 11.4% are unemployed, and 2.3% preferred not to answer the question. One participant (2.3%) reported seasonal or migrant farm work being part of they or their family’s main source of income in the last 2 years. Of those unemployed and not seeking work, thirteen respondents went on to specify their answer: 27.3% (n=12) were disabled, and 2.3% (n=1) were current students. The vast majority (97.7%) of respondents (n=43) reported never being discharged from the U.S. armed forces and one respondent (2.3%) selected “I choose not to answer this question”.

Insurance Status

One-half of participants reported being privately insured, followed by Medicare (25%), Medicaid (22.7%), and "Other public insurance - not CHIP (Children's Health Insurance Program)" (2.3%). No participants reported being without health insurance coverage.

Table I: Participant Demographics

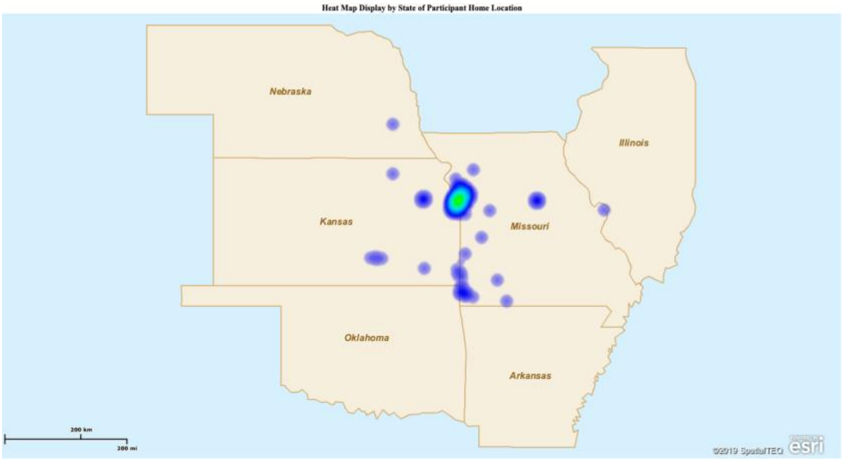
	Self-Recorded (Redcap) N (%)	RN Interview N (%)	Pen & Paper N (%)	Total N (%)
Total				
Assessment completed	15 (34.1)	15 (34.1)	14 (31.8)	44 (100)
Ethnicity				
Hispanic or Latino	2 (13.3)	0	0	2 (4.5)
Not Hispanic	13 (86.7)	15 (100)	14 (100)	42 (95.5)
Race				
American Indian/Alaskan Native	0	0	1 (7.1)	1 (2.3)
Asian	0	0	0	0
Black/African American	1 (6.7)	1 (6.7)	0	2 (4.5)
Native Hawaiian	0	0	0	0
Pacific Islander	0	0	0	0
White	13 (86.6)	14 (93.3)	13 (92.9)	40 (90.9)
Other	1 (6.7)	0	0	1 (2.3)
Age				
Mean Age	28.7	31	31.6	--
Gender				
Male	8 (18.2)	8 (18.2)	5 (11.3)	21 (47.7)
Female	7 (15.9)	7 (15.9)	9 (20.5)	23 (52.3)
Education				
Less than high school degree	1 (2.3)	2 (4.5)	0	3 (6.8)
High school diploma or GED	3 (6.8)	2 (4.5)	5 (11.4)	10 (22.7)
More than high school	11 (25)	11 (25)	9 (20.5)	31 (70.5)
Preferred language				
English	15 (34.1)	15 (34.1)	14 (31.8)	44 (100)
Language other than English	0	0	0	0
Employment status				
Unemployed	3 (6.8)	1 (2.3)	1 (2.3)	5 (11.4)
Part-time or temporary work	0	2 (4.5)	5 (11.4)	7 (15.9)
Full-time work	6 (13.6)	4 (9.1)	5 (11.4)	15 (34)
Other (student, retired, disabled, unpaid primary caregiver)	5 (11.4)	8 (18.2)	3 (6.8)	16 (36.4)

Unanswered	1 (2.3)	0	0	1 (2.3)
Migrant farm work past 2 years				
Yes	0	0	1 (2.3)	1 (2.3)
No	14 (32.6)	15 (34.9)	13 (30.2)	42 (97.7)
Unanswered	1 (2.3)	0	0	1 (2.3)
Insurance				
None/uninsured	0	0	0	0
CHIP-Medicaid	0	0	0	0
Medicaid	4 (9.1)	2 (4.5)	4 (9.1)	10 (22.7)
Medicare	4 (9.1)	6 (13.6)	1 (2.3)	11 (25)
Other public insurance (not CHIP)	0	0	1 (2.3)	1 (2.3)
Other public insurance (CHIP)	0	0	0	0
Private insurance	7 (15.9)	7 (15.9)	8 (18.2)	22 (50)
Discharged from Armed Forces				
Yes	0	0	0	0
No	14 (31.8)	15 (34.1)	14 (31.8)	43 (97.7)
Unanswered	1 (2.3)	0	0	1 (2.3)

Residence

Figure 2 displays where participants reside with more than half residing in Missouri (52.3%), Kansas (43.2%) and Nebraska (2.3%). In regard to living status, 11.4% of participants reported living alone while 88.6% reported living with family members or a significant other (Map Business Online website, n.d., figure 2).

Figure II: Residency by geographic location



Social Needs

Resource insecurity is often not isolated to one determinant as individuals who face insecurity in one domain are often impacted across multiple domains (Singh et al., 2017). Of the 44 respondents to the material security items, the most frequently reported need was healthcare insecurity (15.9%), followed by utility insecurity (13.6%), food insecurity (9.1%), clothing insecurity (9.1%), phone insecurity (6.8%), and other insecurity (6.8%). Participants were given an option to include "other" answers as write-in options. Participants identified: housing, transportation, and internet as areas of social need. Table 2 displays the percentage of patients reporting insecurity across a combination of determinants.

Table II: Resource & transportation insecurity (in past 12 months)

	Self-Recorded (REDCap) N (%)	RN Interview N (%)	Pen & Paper N (%)	Total N (%)
Resource insecurity				
Food insecurity	1 (2.3)	2 (4.5)	1 (2.3)	4 (9.1)
Clothing insecurity	2 (4.5)	2 (4.5)	0	4 (9.1)
Utility insecurity	1 (2.3)	4 (9.1)	1 (2.3)	6 (13.6)

Childcare insecurity	0	0	0	0
Healthcare insecurity	4 (9.1)	2 (4.5)	1 (2.3)	7 (15.9)
Phone insecurity	1 (2.3)	2 (4.5)	0	3 (6.8)
Other necessity	0	3 (6.8)	0	3 (6.8)
Transportation insecurity				
Transportation (overall)	4 (9.1)	3 (6.8)	2 (4.5)	9 (20.4)
Transportation (medical)	3 (6.8)	3 (6.8)	2 (4.5)	8 (18.1)
Transportation (nonmedical)	2 (4.5)	2 (4.5)	0	4 (9)

Transportation

Forty-four participants responded to questions about Transportation Insecurity. Of the 44 respondents, 20.4% (n=9) of participants expressed that lack of transportation had kept them from medical appointments, meetings, work, or from getting things needed for daily living. More specifically, 18.2% (n=8) stated that lack of transportation had prevented them from getting medications and 9% (n=4) of participants reported that lack of transportation had kept them from non-medical meetings, appointments, work, or from getting things that they needed.

Social Integration and Support

Of the 44 respondents who answered the questions on social support, 68.2% (n=10) reported talking to and being around people they are close to five or more times per week. Six respondents (13.6%) reported having this contact three to five times per week, 9.1% (n=4) state they talk to and spend time with people they care about one to two times per week, and 9.1% (n=4) say this occurs less than once a week.

Stress

Forty-four respondents ranked their stress level from “Not at all” to “Very much”. Eight respondents (18.2%) stated their stress level was “Very much”. Ten respondents (22.7%) ranked their stress level as “Quite a bit”; 27.3% (n=12) felt they were “Somewhat” stressed; 27.3% (n=12) said they were “A little bit” stressed; and 2.3% (n=1) said they were “Not at all” stressed. Only one respondent (2.3%) intentionally chose not to answer the question.

Incarceration History and Refugee Status

None of the forty-four respondents reported spending more than two nights in a row in jail, prison, detention center, or juvenile correctional facility. All responses for refugee status were also negative.

Safety

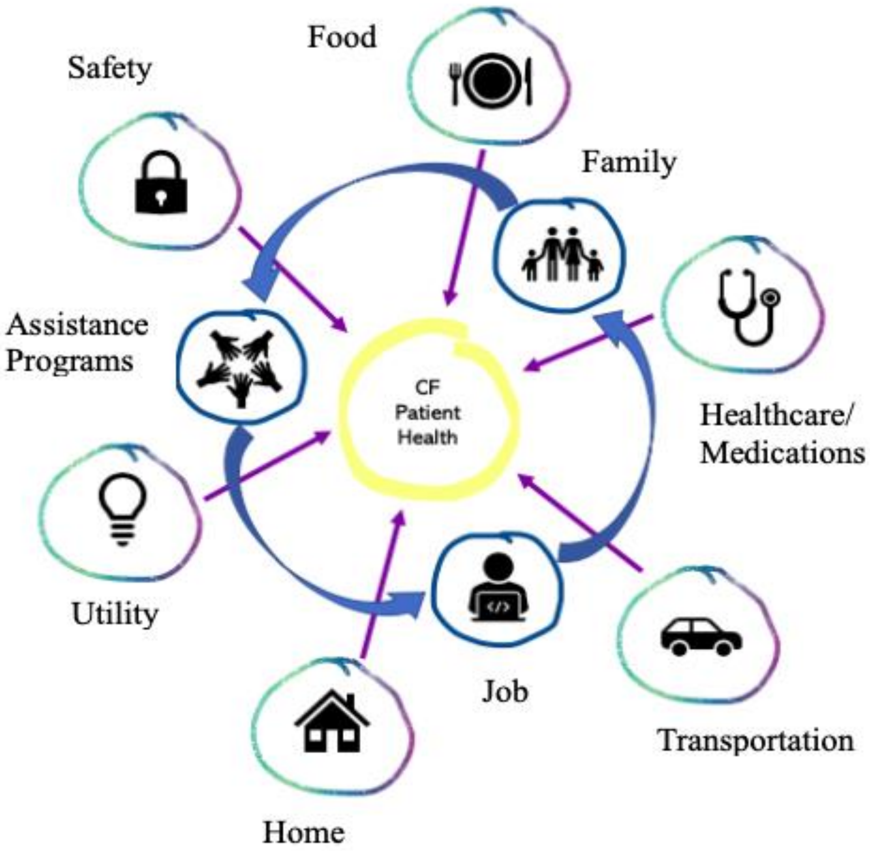
Of the 44 respondents, 88.6% (n=39) reported feeling physically and emotionally safe where they currently lived. Three respondents (6.8%) stated that they did not feel physically and emotionally safe, and 2.3% (n=1) of respondents felt unsure about their physical and emotional safety. One respondent (2.3%) selected “I chose not to answer the question.”

When asked about domestic partner violence, 84.1% (n=37) of respondents stated that they had not been afraid of their partner or ex-partner in the last year. Fear of a partner or ex-partner was reported by 2.3% (n=1), and 9.1% (n=4) stated that they had not had a partner or ex-partner in the past year. Two respondents (4.5%) selected “I choose not to answer the question.”

Qualitative Data

The RN interview study arm presented additional information regarding SBDH which impact the lives of CF patients. These comments were shared by respondents voluntarily. Respondent comments were recorded and grouped by themes and sub-themes. Respondent remarks represented two main themes:1) concerns and 2) support systems as illustrated in Figure 3. Concerns repeatedly described by respondents included: Lack of food; inability to afford/attain medications or healthcare when needed; lack of transportation; homelessness or concerns about losing their housing; inability to afford utility payments; and concerns over safety and security where they live. Support systems mentioned frequently by respondents included: Family presence/support; jobs/employment; and various assistance programs provided through the Cystic Fibrosis Foundation and pharmaceutical companies.

Figure III: CF patient SBDH impacts & support systems



Feasibility Assessment

Time to Complete

Forty-four CF patient participants completed the entire feasibility assessment. The RN primary investigator (PI) administered all of the feasibility assessments to all participants. The feasibility assessment was administered as a one-on-one interview.

Table 3 displays the time required for the RN to educate the patient on the assessment, and the patients' perception of time required to complete the assessment. Twenty-eight (63.8%) of the patients required 0-2 minutes of education, and 36.4% (n=16) of patients required "3-5 minutes" of education time from the PI. For comparison, participant's perception of time to complete is also displayed by study arm in Table 4. The majority of participants in all three survey arms ranked 3-5 minutes as the time required to complete the assessment. These results are displayed in Figure 4.

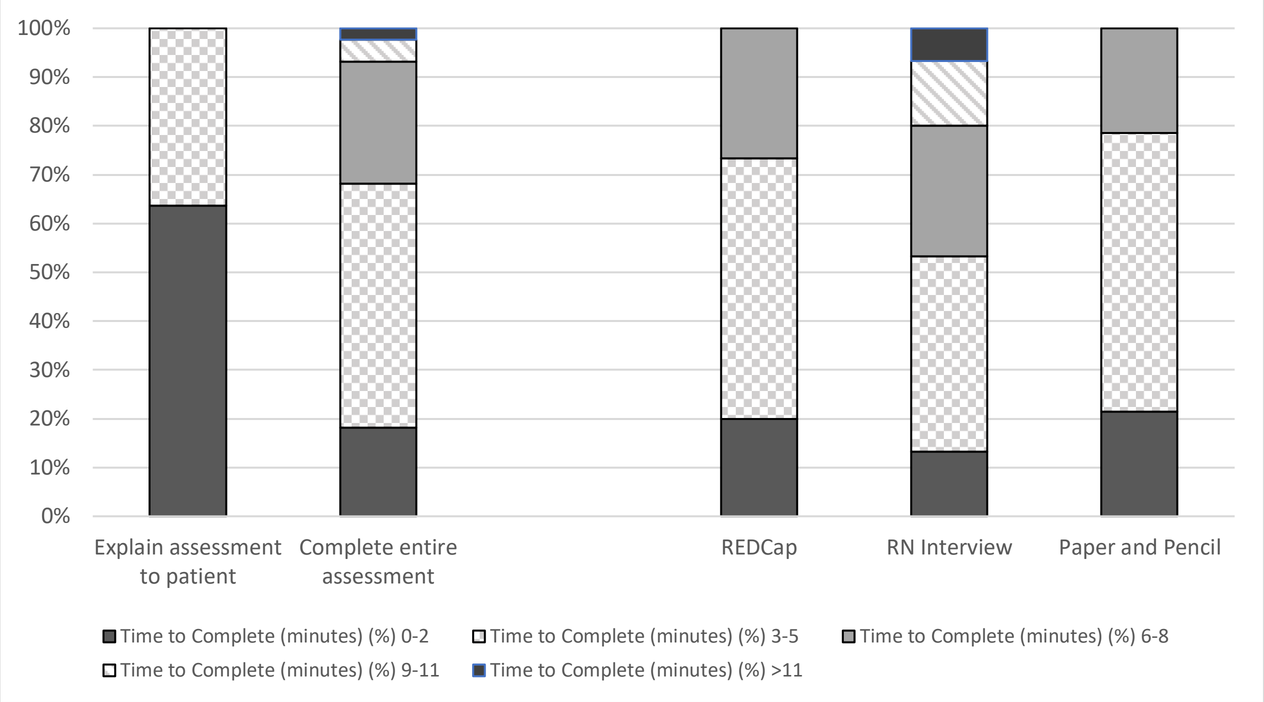
Table III: Time required to complete PRAPARE assessment tool

	Time to Complete (minutes) (%)				
	0-2	3-5	6-8	9-11	>11
Explain assessment to patient	28 (63.6)	16 (36.4)	0	0	0
Complete entire assessment	8 (18.2)	22 (50)	11 (25)	2 (4.5)	1 (2.3)

Table IV: Time to complete study arm

	Time to Complete (minutes) (%)				
	0-2	3-5	6-8	9-11	>11
REDCap	3 (20)	8 (53.3)	4 (26.7)	0	0
RN Interview	2 (13.3)	6 (40)	4 (26.7)	2 (13.3)	1 (6.7)
Paper and Pencil	3 (21.4)	8 (57.1)	3 (21.4)	0	0

Figure IV: Time required to perform PRAPARE assessment tool

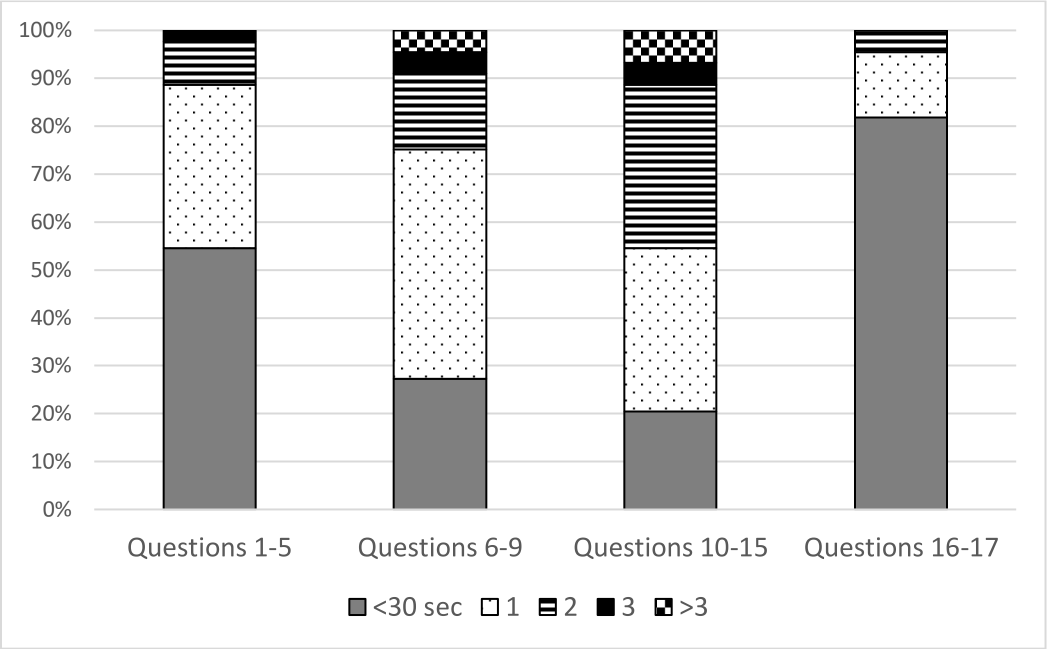


To gain a better understanding of the time distribution for completing each section of the assessment (excluding the optional questions), participants were asked to rank the time required to complete each section. The respondent's perception of the time required to complete the various sections of the assessment are displayed in Table 5. This data is presented in Figure 5.

Table V: Time required to complete PRAPARE assessment tool by section

	Time to Complete (minutes) (%)				
	<30 sec	1	2	3	>3
Questions 1-5	24 (54.5)	15 (34.1)	4 (9.1)	1 (2.3)	0
Questions 6-9	12 (27.3)	21 (47.7)	7 (15.9)	2 (4.5)	2 (4.5)
Questions 10-15	9 (20.5)	15 (34.1)	15 (34.1)	2 (4.5)	3 (6.8)
Questions 16-17	36 (81.8)	6 (13.6)	2 (4.5)	0	0

Figure V: Time required to complete PRAPARE assessment tool by section



Burden, Understandability and Comfort

When asked how burdensome the assessment was to complete, 93.2% (n=41) of respondents stated that the assessment was "Not at all" burdensome. Two of the respondents (4.5%) felt the assessment was "Not" burdensome, and one respondent (2.3%) stated it was "Somewhat" burdensome as displayed in Table 6. Burden, understandability and comfort are further detailed by study arm in Table 7. Literature suggests some of the questions regarding ethnicity, income, resource insecurities, safety, and domestic violence can be uncomfortable to ask in the healthcare setting. When asked if the assessment questions made them feel uncomfortable, 90.9% (n=40) of respondents replied, "Not at all"; 6.8% (n=3) replied "Not", and 2.3% (n=1) replied "Somewhat". When asked if they would be willing to complete the assessment again in the future, 93.2% (n=41) replied “Very much”; 4.5% (n=2) replied “Somewhat”, and 2.3% (n=1) said “Not”. Participant perception data is presented in Figure 6.

Table VI: Participant perceptions of PRAPARE assessment tool

	Not at all	Not	Somewhat	Very much
How burdensome was the assessment	41 (93.2)	2 (4.5)	1 (2.3)	0
How understandable was the assessment	0	1 (2.3)	2 (4.5)	41 (93.2)
Questions make you feel uncomfortable	40 (90.9)	3 (6.8)	1 (2.30	0
How willing are you to complete the assessment again in the future	0	1 (2.3)	2 (4.5)	41 (93.2)
Did independent completion help you to be more honest in your answers	4 (9.1)	3 (6.8)	1 (2.3)	7 (15.9)

Figure VI: Participant perceptions of PRAPARE assessment tool

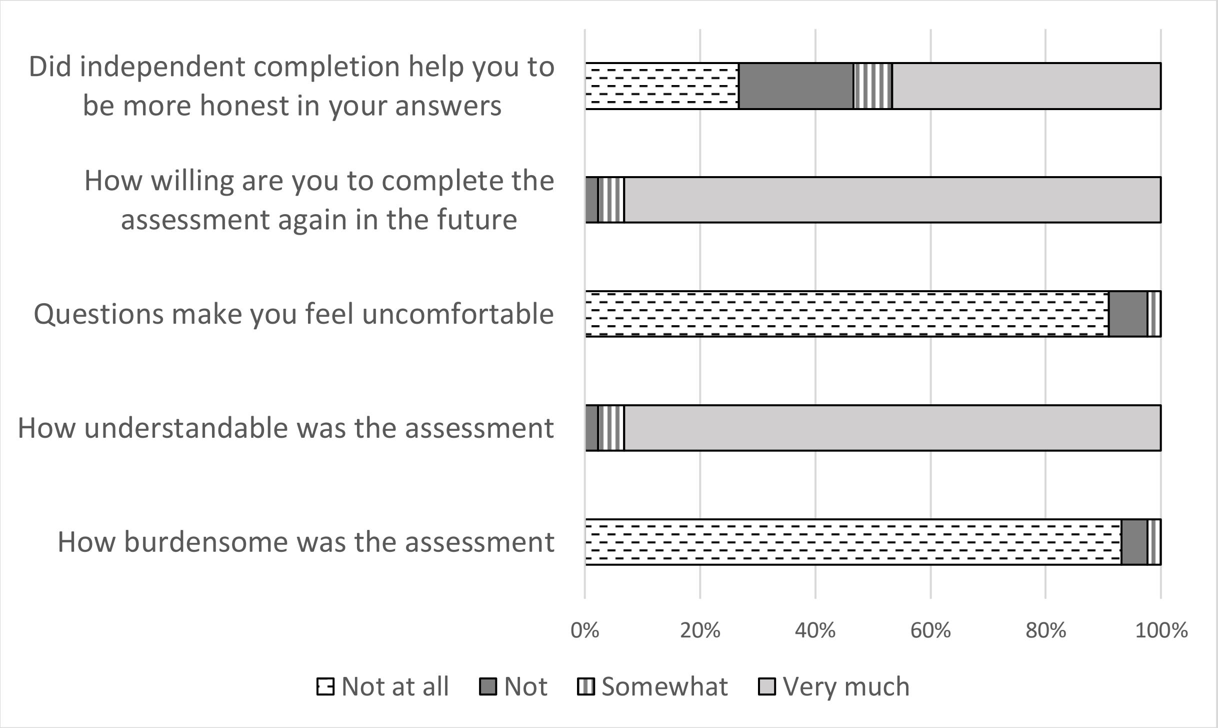


Table VII: Participant perceptions of PRAPARE assessment tool by study arm

	Not at all	Not	Somewhat	Very much
How burdensome was the assessment				
REDCap	13 (86.7)	2 (13.3)	0	0
RN Interview	15 (100)	0	0	0

Paper and Pencil	13 (92.9)	0	1 (7.1)	0
How understandable was the assessment				
REDCap	0	0	1 (6.7)	14 (93.3)
RN Interview	0	0	0	15 (100)
Paper and Pencil	0	1 (7.1)	1 (7.1)	12 (85.7)
Questions make you feel uncomfortable				
REDCap	12 (80)	2 (13.3)	1(6.7)	0
RN Interview	14 (93.3)	1 (6.7)	0	0
Paper and Pencil	14 (100)	0	0	0
How willing are you to complete the assessment again in the future				
REDCap	0	0	1 (6.7)	14 (93.3)
RN Interview	0	0	1 (6.7)	14 (93.3)
Paper and Pencil	0	1 (7.1)	0	13 (92.9)
Did independent completion help you to be more honest in your answers				
REDCap	4 (26.7)	3 (20)	1 (6.7)	7 (46.7)

Honesty

In this study, respondents who participated in the RedCap study arm were asked if they felt taking the assessment independently allowed them to be more honest in their responses. Of the fifteen respondents, 47.6% (n=7) responded “Very Much”, 6.7% (n=1) responded “Somewhat”; 20% (n=3) stated “Not”, and 26.7% (n=4) said “Not at all”. These results are displayed in Table 7.

Human Subject Protection

This was a quality improvement project for TUKHS and reviewed for human subject’s protection by the Institutional Review Board (IRB) for approval prior to any data collection. Submission for approval was made to the University of Kansas Medical Center (KUMC) research protocol involving human subjects. There were no physical, social, or economic risks anticipated. Patients were allowed to refuse to answer any question in the

PRAPARE assessment instrument. Any missing information was noted in the study data. The psychology services of the cystic fibrosis program at TUKHS were available to any patients who noted emotional distress, as appropriate. A secure drive was maintained by the PI to house an Excel spreadsheet that tracked study participants. Each participant was e assigned a number for the project which will serve as their unique patient identifier for the remainder of the study. All data collection was conducted on site at TUKHS. All paper documents and electronic data were retained in the appropriate designated locations as indicated by the IRB document retention policy. In addition to IRB approval, the PI also obtained a letter of support to conduct the project from the Chief of Nursing at TUKHS prior to beginning the project (Appendix D).

Discussion

Patients, in general, were very receptive to participation and helping the PI gain more information that might support identifying and meeting patient's needs outside of the hospital. In all, of the forty-six patients asked to participate, only two patients declined. These patients stated that they felt that since they were not frequently admitted to the hospital, they did not have much information to contribute to the assessment.

A total of 44 patients participated in the study. Fifteen patients were assigned to the REDCap study arm, 15 patients were assigned to the RN interview study arm, and 14 patients were assigned to the pen & paper study arm. All 44 patients participated in the feasibility assessment following the completion of the PRAPARE assessment tool. Through administration of the PRAPARE assessment tool, it was discovered that the most frequent social needs amongst CF patients were transportation (20.4%), followed by healthcare (15.9%), and utility (13.6%). All three methods of PRAPARE assessment tool administration proved to be feasible for inpatient workflow with overall education to completion time ranging from 7-10 minutes. All three methods of administration (REDCap, RN interview, and pen & paper) received positive feedback from respondents. Differences in administration method does impact time commitment from the RN.

Ethnicity and CF

Cystic Fibrosis occurs when a child inherits a copy of a mutation on the cystic fibrosis transmembrane conductor regulator (CFTR) gene from each parent. Having only one copy of the CFTR gene makes a person a carrier of Cystic Fibrosis, but they do not have the disease. Over 10 million Americans are carriers of CFTR gene mutations – being a carrier or having CF largely depends largely upon race and ethnicity (Cystic Fibrosis Foundation [CFF], n.d.). The majority of individuals with Cystic Fibrosis are Caucasian, of European descent. However, there are over 1,700 CF causing CFTR mutations which vary by race (CFF, n.d.). These same genetic inheritance patterns for the CF population have displayed in the data from this study. It has been well studied that there exists a link between race/ethnicity and racism, and social determinants such as: neighborhood conditions, working conditions, education, and income and wealth (Bharmal, Derose, Felicial & Weden, 2015). Unfortunately, the sample size for this study was too small to ascertain if racial impacts were applicable. Given that CF is a disease often diagnosed in early childhood, it was not expected for this population to have spent time in military service due to the likelihood of service ineligibility.

Resource Insecurity

CF is an interesting disease process to study resource insecurity. Of the patients studied, the mean age was thirty years, and 88.6% reported living with family members or significant others. Cystic Fibrosis carries a public perception of being a “childhood” disease, as for decades, many patients did not live past their mid-twenties (CFF, n.d.). Thanks to many great advances in care and patient education, the age curve has dramatically shifted, as has the quality of life for these patients. That being said, patients now face new challenges of transitioning into adult life with chronic illness and the vast challenges and expenditures that come with it (CFF, n.d.).

This study revealed that of all the resource insecurity concerns, transportation, medical, and utility insecurity ranked among the highest. While there were no strong correlations found between the MVPs readmissions (greater than five readmissions per calendar year) and each of the individual’s insecurities, an interesting pattern did arise from the data. With each insecurity: food, clothing, utility, medical, and transportation, patients with four or fewer readmissions reported these insecurities with higher frequency than the MVP patients. These results indicate that SBDH, and especially those noted, play a significant role in all readmissions for this population. Does this mean that the care team does a better job of addressing these insecurities for “frequent flyer” patients than those admitted less often? Are these patients having fewer touches with the care team and thus not being assessed for their SBDH needs? These are valid questions which unfortunately this study is not able to offer an answer.

Access to Care

Managing unexpected hospitalizations, the expense of daily treatments, and access to specialty care centers requires CF patients to have access to affordable health insurance (Cystic Fibrosis Foundation [CFF], n.d.). “Lack of health insurance is associated with lower rates of preventative care, delays in necessary care, foregone care, medical bankruptcy, and increased mortality,” (Christopher et al., 2016, p. 63). Surprisingly, none of the respondents in the assessment reported being uninsured. This is likely because many individuals with CF meet disability requirements and are therefore eligible for Medicaid coverage if they are unable to sustain a career due to illness. Additionally, many participants reported receiving insurance coverage through a job or coverage under a parental insurance plan. CF is known for being a "well-resourced" disease (CFF, n.d.). The Cystic Fibrosis Foundation is recognized for their outreach work to help get patients established with support and resources (CFF, n.d.). CF centers are also equipped to provide patients with case management and social work assistance in addition to helping meet their medical needs (CFF, n.d.).

Social Connectedness and Stress

The importance of social connectedness to public mental health has long been established (Saeri, Cruwys, Barlow, Stronge, & Sibley, 2017). People with limited social interaction have poorer mental and physical health, as well as higher rates of depression and die earlier than those who report higher levels of social connectedness (Saeri, Cruwys, Barlow, Stronge, & Sibley, 2017). CF has been stigmatized as a socially isolating disease because of infection control concerns for patients who risk transmitting bacteria between each other (Cystic Fibrosis Foundation [CFF], n.d.). This cross-infection can lead to serious antibiotic-resistant infections which can permanently damage lung function, negatively impact a patient's ability to be a lung transplant candidate, and increase mortality rates (Toth, 2016). Great lengths are undertaken to keep individuals with CF from coming into contact with each other in both the healthcare and the general public settings. This inability to have physical contact with others who have CF and understand the CF world can be very difficult for many individuals with CF (Toth, 2016).

In the study, the majority of respondents reported connectedness at “three or more” to “five or more times per week”. Overall, connectedness for the respondents equates to over three-fourths of participants having “socially connected time” at least every-other-day, if not more frequently. This frequency is not surprising, given that the vast majority of respondents reported living with family members or a significant other, who provide the social connection and support system. What is not clear from the data is how much of the feelings of connectedness come from live-in support systems with whom the participants have physical contact versus online groups or social media friends.

A 2015 study by Mitmansgruber et al., found that despite the complex and demanding care regimens that can take a toll on both CF patients and their families, CF patients report psychological functioning similar to healthy control groups. Mitsmansgruber believes this is because CF patients have lived through a stressful young life of chronic illness and found a way to regulate their emotions to bounce back from adversity which aides their resilience and coping (Mitsmansgruber et al., 2015). It is unclear what role stress plays in coping with social determinant insecurities. Further study will be needed to determine if it is protective or if it potentiates a “life-course approach” which affects individuals during critical life stages (Bharmal, Derose, Felicial & Weden, 2015).

Feasibility

Guise et. al. (2017) has shown the feasibility of assessing Institute of Medicine recommended SBDH measures in medical practice. This is significant because feasibility studies for SBDH outside of community health are limited. In fact, the author believes this to be the first study on feasibility of SBDH assessment in the inpatient setting, and specifically focused on the CF population.

The overall reporting for time, burden, understandability, comfort, and honesty from the feasibility study were all very positive and reflected minimal impact on the patient and the RN. All three methods of PRAPARE assessment tool administration proved to be feasible for inpatient workflow with overall education to completion time ranging from 5-10 minutes. All three methods of administration (REDCap, RN interview, and pen & paper) received positive feedback from respondents. Differences in administration method did not result in a variation on the impact of time commitment from the RN. These results, combined with the potential to gain very critical social determinant needs information on patients, make for a very compelling argument to implement a social and behavioral determinant needs assessment in the inpatient setting. The sample size was too small to show significance in the mode of assessment data collection. Based on comments collected and literature that suggests utilizing computer-based (self-administration) modes to survey individuals garners more honest responses than interview-based techniques (Chang & Krosnick), which may suggest that self-administration mode removes the respondent's natural inclination to conform to socially desirable standards (Liu & Wang, 2015; Chang & Krosnick, 2010). Additionally, the computer-based mode has been shown to result in respondents having fewer completion mistakes, leaving fewer items blank, and refusing to answer fewer questions than pen and paper respondents (Chang & Krosnick, 2010).

Limitations

While the author is pleased with the positive patient participation response, the sample size has been the limiter to this study. It has been challenging not to be able to run statistical analysis on the data collected. The author does believe that in time, enough participants can be gathered to ascertain statistical significance, but more time would be required than what was available for this study.

SBDH are not new concepts yet assessing for them in the inpatient setting has raised many eyebrows and sparked several lively conversations regarding resource availability, both in the community and among our care providers. Indeed, while everyone involved understands the importance of decreasing readmissions, keeping patients healthy, and meeting the needs of the community, there is a great amount of uncertainty about how that can possibly happen in our current system.

Conclusion

SBDH strongly influences health, as well as the management of a chronic disease. They are recognized as a key factor in population health management and value-based care. SBDH deficits often interfere with patient's ability to maintain their health post-discharge; hence, the assessment and use of SBDH are important inpatient activities, to support transitions of care in which nursing will play a key role.

This study has shown the feasibility of assessing SBDH needs during the inpatient stay. This feasibility establishes an opportunity to incorporate the PRAPARE assessment into the inpatient admission process for all patients, particularly those with chronic disease. Future study will be needed to examine the impacts of addressing SBDH on patient readmissions. This study has illustrated that slowing the problem of growing readmission rates and increased inpatient utilization may, in fact, lie with addressing SBDH. Designing the nursing workflows to include these assessments will require nurses in various roles – both clinical and administrative - to advocate for the needs of patients and to be innovative in the application of these assessment tools.

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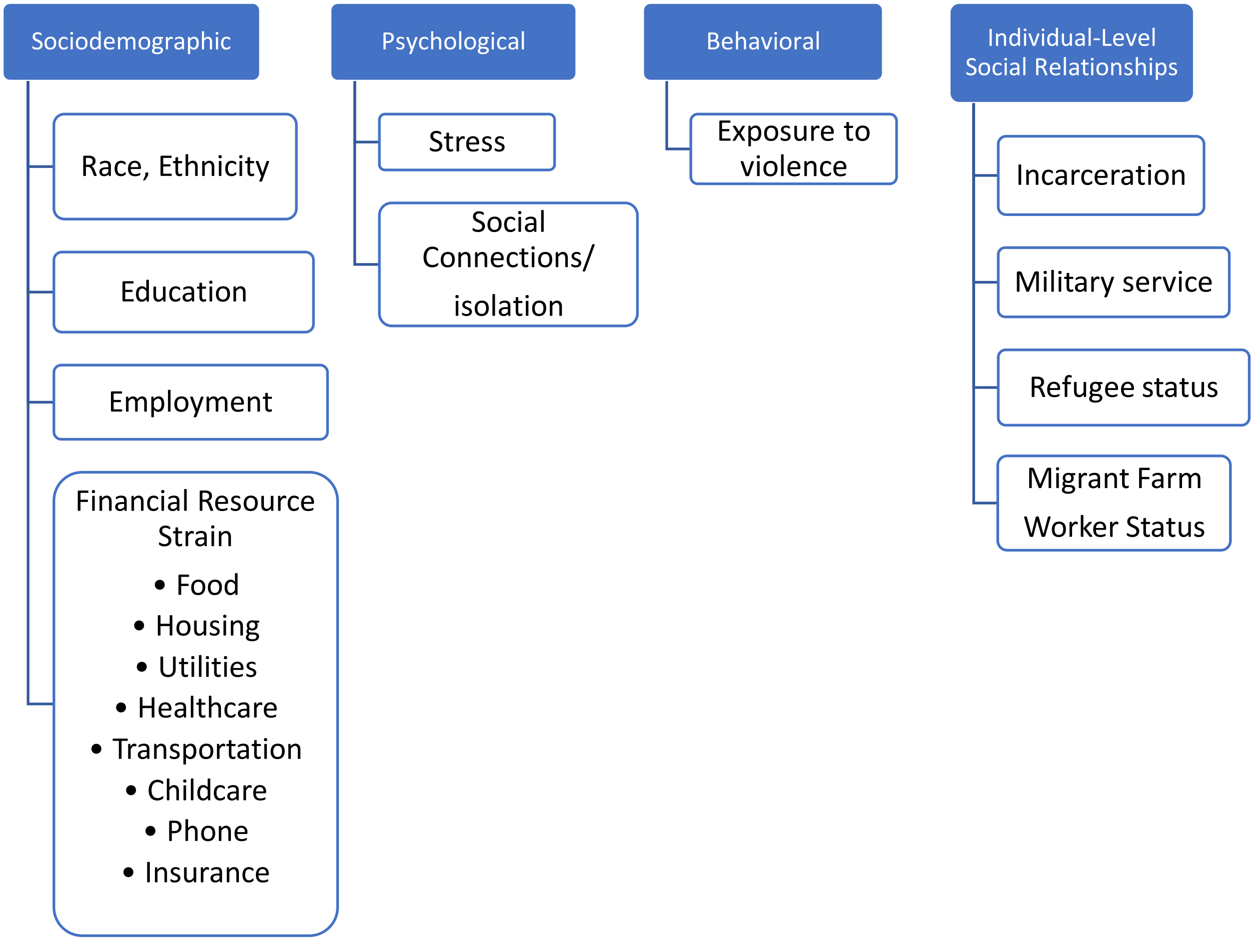
Table of Figures

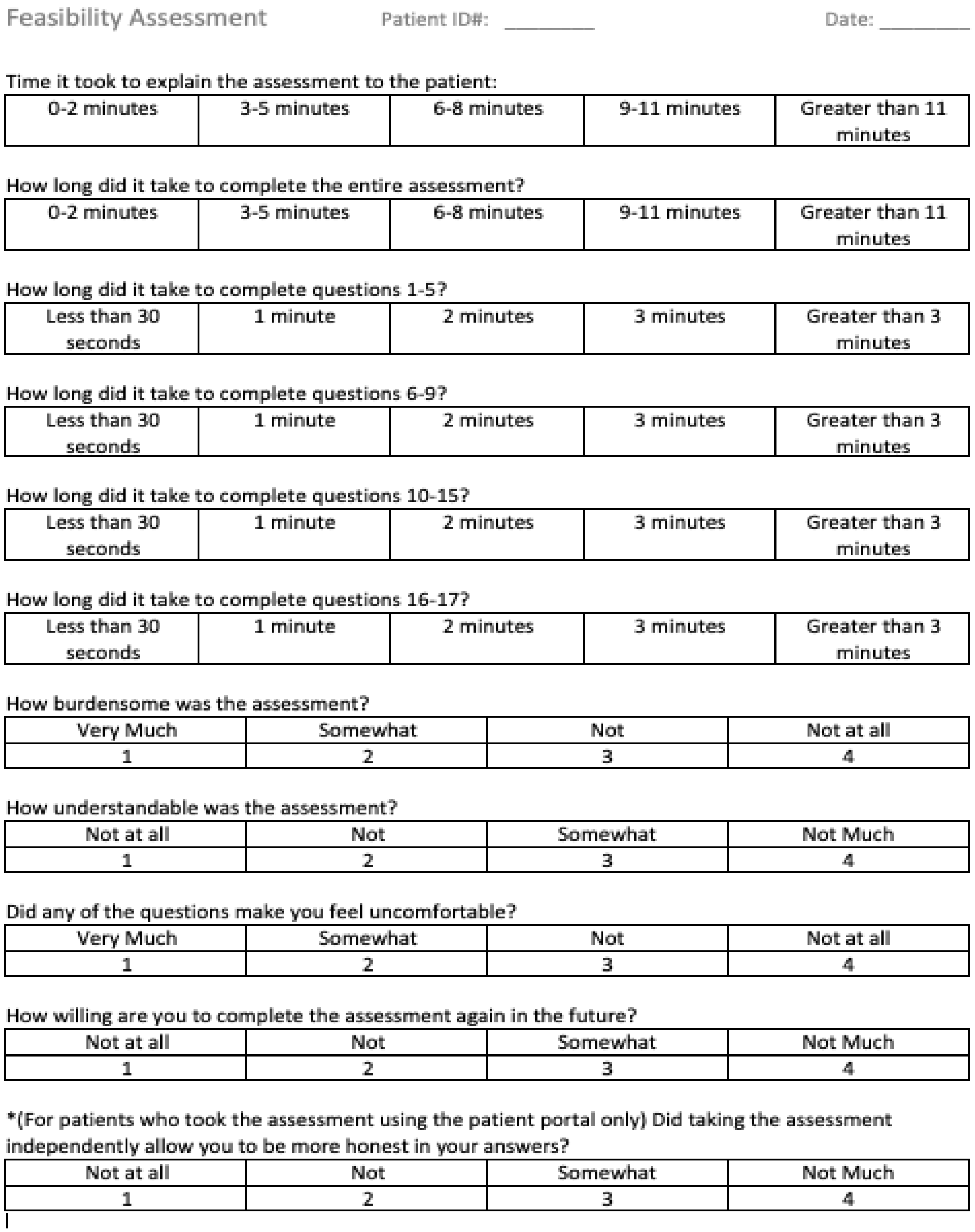
Appendix A

PRAPARE Assessment Domains & Individual Determinants



Appendix B

Feasibility Assessment



Feasibility Assessment Patient ID#: ________ Date: ________

Time it took to explain the assessment to the patient:

0-2 minutes	3-5 minutes	6-8 minutes	9-11 minutes	Greater than 11 minutes

How long did it take to complete the entire assessment?

0-2 minutes	3-5 minutes	6-8 minutes	9-11 minutes	Greater than 11 minutes

How long did it take to complete questions 1-5?

Less than 30 seconds	1 minute	2 minutes	3 minutes	Greater than 3 minutes

How long did it take to complete questions 6-9?

Less than 30 seconds	1 minute	2 minutes	3 minutes	Greater than 3 minutes

How long did it take to complete questions 10-15?

Less than 30 seconds	1 minute	2 minutes	3 minutes	Greater than 3 minutes

How long did it take to complete questions 16-17?

Less than 30 seconds	1 minute	2 minutes	3 minutes	Greater than 3 minutes

How burdensome was the assessment?

Very Much	Somewhat	Not	Not at all
1	2	3	4

How understandable was the assessment?

Not at all	Not	Somewhat	Not Much
1	2	3	4

Did any of the questions make you feel uncomfortable?

Very Much	Somewhat	Not	Not at all
1	2	3	4

How willing are you to complete the assessment again in the future?

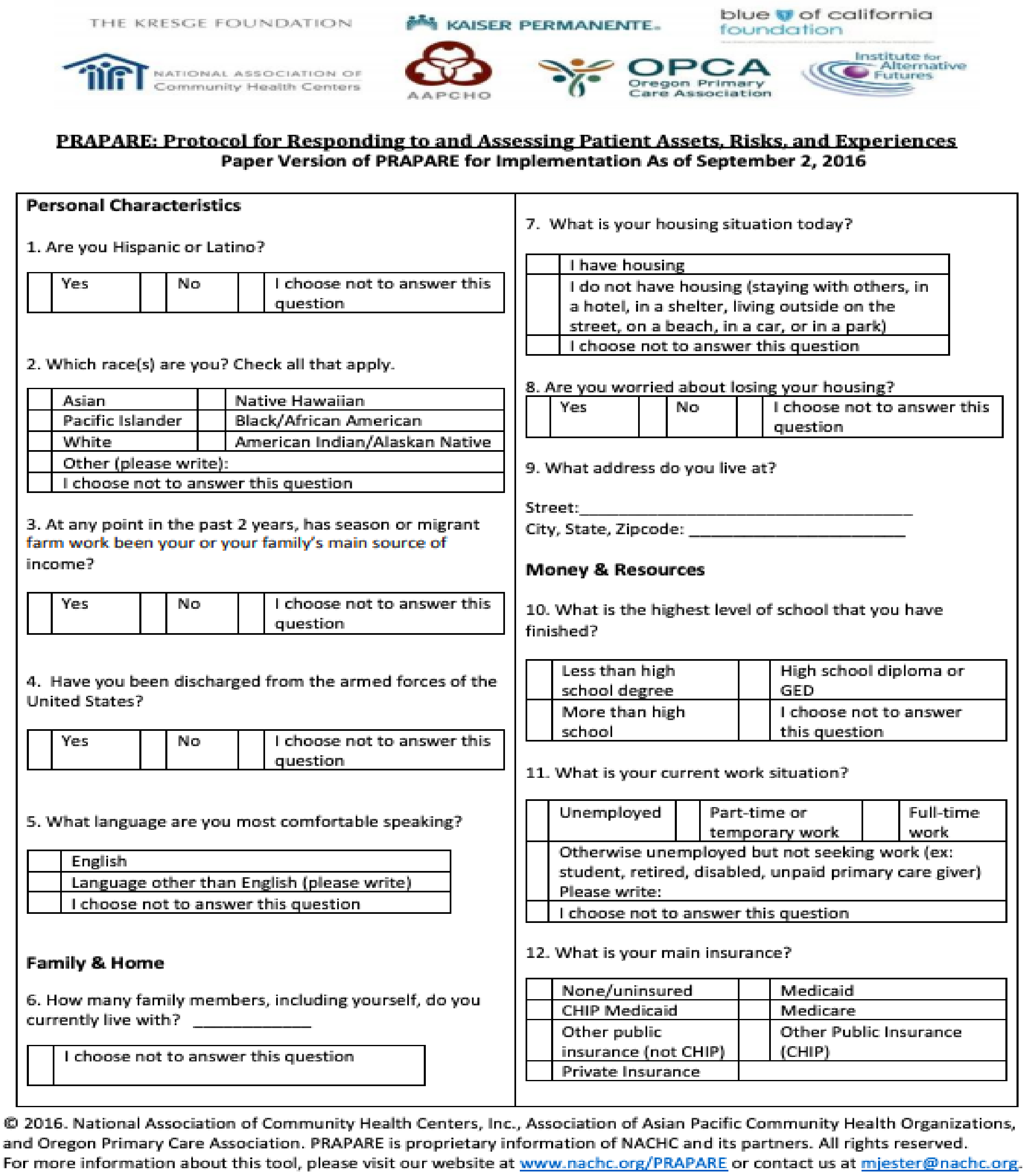
Not at all	Not	Somewhat	Not Much
1	2	3	4

*(For patients who took the assessment using the patient portal only) Did taking the assessment independently allow you to be more honest in your answers?

Not at all	Not	Somewhat	Not Much
1	2	3	4

Appendix C

PRAPARE Assessment Tool



THE KRESGE FOUNDATION KAISER PERMANENTE. blue of california foundation

NATIONAL ASSOCIATION OF Community Health Centers AAPCHO OPCA Oregon Primary Care Association Institute for Alternative Futures

PRAPARE: Protocol for Responding to and Assessing Patient Assets, Risks, and Experiences
Paper Version of PRAPARE for Implementation As of September 2, 2016

Personal Characteristics

1. Are you Hispanic or Latino?

☐	Yes	☐	No	☐	I choose not to answer this question

2. Which race(s) are you? Check all that apply.

☐	Asian	☐	Native Hawaiian
☐	Pacific Islander	☐	Black/African American
☐	White	☐	American Indian/Alaskan Native
☐	Other (please write):		
☐	I choose not to answer this question		

3. At any point in the past 2 years, has season or migrant farm work been your or your family's main source of income?

☐	Yes	☐	No	☐	I choose not to answer this question

4. Have you been discharged from the armed forces of the United States?

☐	Yes	☐	No	☐	I choose not to answer this question

5. What language are you most comfortable speaking?

☐	English
☐	Language other than English (please write)
☐	I choose not to answer this question

Family & Home

6. How many family members, including yourself, do you currently live with? _____________

☐	I choose not to answer this question

7. What is your housing situation today?

☐	I have housing
☐	I do not have housing (staying with others, in a hotel, in a shelter, living outside on the street, on a beach, in a car, or in a park)
☐	I choose not to answer this question

8. Are you worried about losing your housing?

☐	Yes	☐	No	☐	I choose not to answer this question

9. What address do you live at?

Street:____________________________________
City, State, Zipcode: ______________________

Money & Resources

10. What is the highest level of school that you have finished?

☐	Less than high school degree	☐	High school diploma or GED
☐	More than high school	☐	I choose not to answer this question

11. What is your current work situation?

☐	Unemployed	☐	Part-time or temporary work	☐	Full-time work
☐	Otherwise unemployed but not seeking work (ex: student, retired, disabled, unpaid primary care giver) Please write:				
☐	I choose not to answer this question				

12. What is your main insurance?

☐	None/uninsured	☐	Medicaid
☐	CHIP Medicaid	☐	Medicare
☐	Other public insurance (not CHIP)	☐	Other Public Insurance (CHIP)
☐	Private Insurance		

For more information about this tool, please visit our website at www.nachc.org/PRAPARE or contact us at mjester@nachc.org.

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NATIONAL ASSOCIATION OF Community Health Centers
AAPCHO
OPCA Oregon Primary Care Association
Institute for Alternative Futures

13. During the past year, what was the total combined income for you and the family members you live with? This information will help us determine if you are eligible for any benefits.

____

☐	I choose not to answer this question

14. In the past year, have you or any family members you live with been **unable** to get any of the following when it was **really needed**? Check all that apply.

Yes	No	Food	Yes	No	Clothing
Yes	No	Utilities	Yes	No	Child Care
Yes	No	Medicine or Any Health Care (Medical, Dental, Mental Health, Vision)			
Yes	No	Phone	Yes	No	Other (please write):
☐	I choose not to answer this question				

15. Has lack of transportation kept you from medical appointments, meetings, work, or from getting things needed for daily living? Check all that apply.

☐	Yes, it has kept me from medical appointments or from getting my medications
☐	Yes, it has kept me from non-medical meetings, appointments, work, or from getting things that I need
☐	No
☐	I choose not to answer this question

Social and Emotional Health

16. How often do you see or talk to people that that you care about and feel close to? (For example: talking to friends on the phone, visiting friends or family, going to church or club meetings)

☐	Less than once a week	☐	1 or 2 times a week
☐	3 to 5 times a week	☐	5 or more times a week
☐	I choose not to answer this question		

17. Stress is when someone feels tense, nervous, anxious, or can't sleep at night because their mind is troubled. How stressed are you?

☐	Not at all	☐	A little bit
☐	Somewhat	☐	Quite a bit
☐	Very much	☐	I choose not to answer this question

Optional Additional Questions

18. In the past year, have you spent more than 2 nights in a row in a jail, prison, detention center, or juvenile correctional facility?

☐	Yes	☐	No	☐	I choose not to answer this question

19. Are you a refugee?

☐	Yes	☐	No	☐	I choose not to answer this question

20. Do you feel physically and emotionally safe where you currently live?

☐	Yes	☐	No	☐	Unsure
☐	I choose not to answer this question				

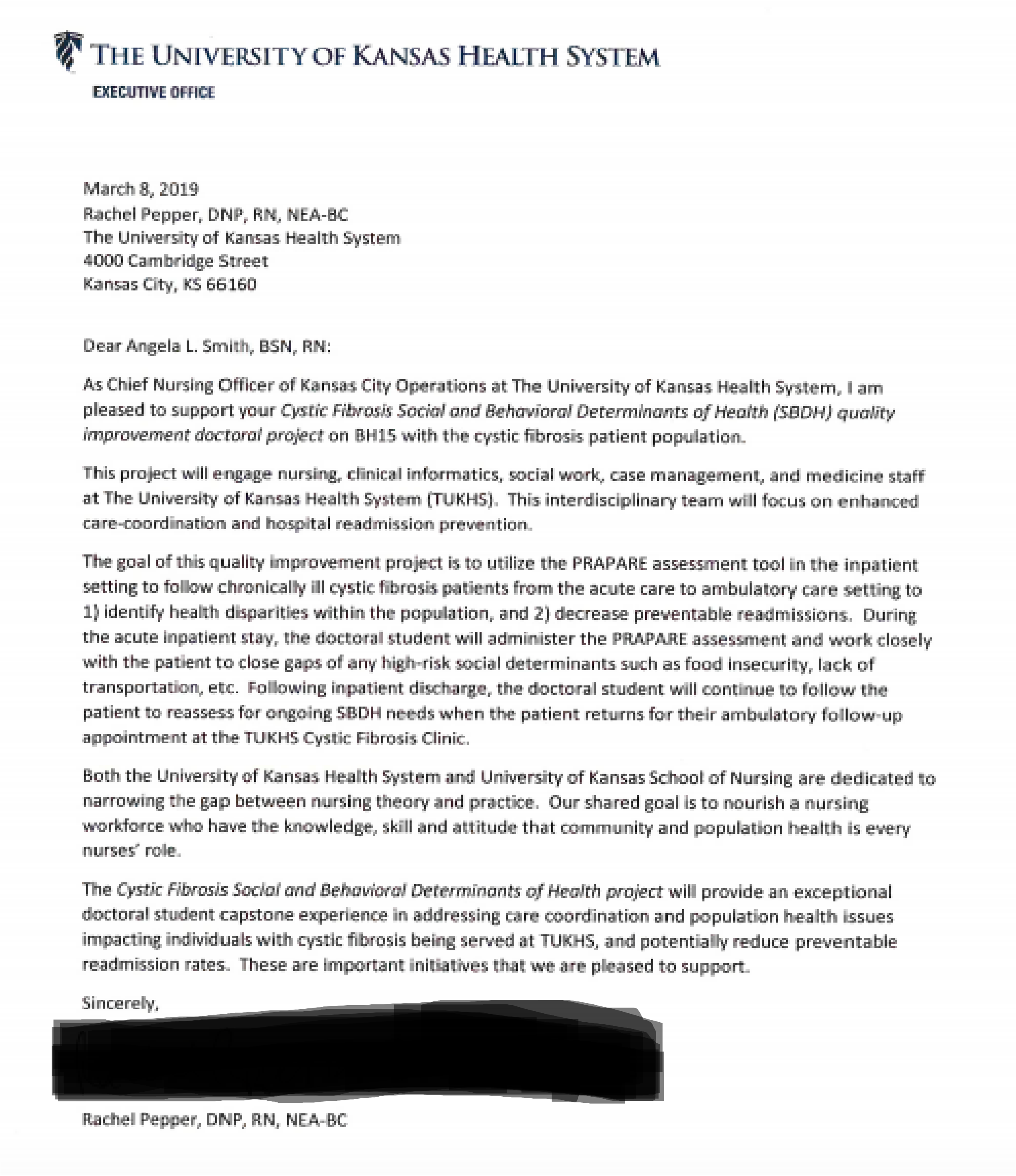
21. In the past year, have you been afraid of your partner or ex-partner?

☐	Yes	☐	No	☐	Unsure
☐	I have not had a partner in the past year				
☐	I choose not to answer this question				

For more information about this tool, please visit our website at www.nachc.org/PRAPARE or contact us at mjester@nachc.org.

Appendix D

Letter of Support from Chief Nurse Officer



THE UNIVERSITY OF KANSAS HEALTH SYSTEM
EXECUTIVE OFFICE

March 8, 2019

Rachel Pepper, DNP, RN, NEA-BC
The University of Kansas Health System
4000 Cambridge Street
Kansas City, KS 66160

Dear Angela L. Smith, BSN, RN:

As Chief Nursing Officer of Kansas City Operations at The University of Kansas Health System, I am pleased to support your *Cystic Fibrosis Social and Behavioral Determinants of Health (SBDH) quality improvement doctoral project* on BH15 with the cystic fibrosis patient population.

This project will engage nursing, clinical informatics, social work, case management, and medicine staff at The University of Kansas Health System (TUKHS). This interdisciplinary team will focus on enhanced care-coordination and hospital readmission prevention.

The goal of this quality improvement project is to utilize the PRAPARE assessment tool in the inpatient setting to follow chronically ill cystic fibrosis patients from the acute care to ambulatory care setting to 1) identify health disparities within the population, and 2) decrease preventable readmissions. During the acute inpatient stay, the doctoral student will administer the PRAPARE assessment and work closely with the patient to close gaps of any high-risk social determinants such as food insecurity, lack of transportation, etc. Following inpatient discharge, the doctoral student will continue to follow the patient to reassess for ongoing SBDH needs when the patient returns for their ambulatory follow-up appointment at the TUKHS Cystic Fibrosis Clinic.

Both the University of Kansas Health System and University of Kansas School of Nursing are dedicated to narrowing the gap between nursing theory and practice. Our shared goal is to nourish a nursing workforce who have the knowledge, skill and attitude that community and population health is every nurses' role.

The *Cystic Fibrosis Social and Behavioral Determinants of Health project* will provide an exceptional doctoral student capstone experience in addressing care coordination and population health issues impacting individuals with cystic fibrosis being served at TUKHS, and potentially reduce preventable readmission rates. These are important initiatives that we are pleased to support.

Sincerely,

[redacted]

Rachel Pepper, DNP, RN, NEA-BC

Appendix E

The project timeline is 12 weeks and is broken down into the stages represented below.

Timeframe	**Action Items**
April	• Complete proposal edits • Seek Approval of Committee • Complete PRAPARE training • Obtain written permission from TUKHS Chief of Nursing, Kansas City Operations • Obtain permission from BH15 Medical Director
May	• Finalize Proposal Defense • Complete mock Patient Portal • Finalize feasibility assessment tools • Obtain QI determination from KUMC IRB
June-August	• Consent 30 patients (10 per assessment group) • Collect SBDH data using PRAPARE assessment tool • Collect feasibility data
September-October	• Data analysis • Finalize study • Present study results