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Recommended Citation

Isebor, Joy, "Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals" (2024). *Doctor of Nursing Practice (DNP) Scholarly Projects*. 65.
https://mavmatrix.uta.edu/nursing_dnpprojects/65

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals

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August 9, 2024

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Acknowledgments

I want to acknowledge everyone who has supported me throughout my Doctor of Nursing Practice (DNP) program. Thanks to my amazing Faculty Project Adviser, Dr. Kristine Cope, for your immense support, guidance, and encouragement. Thank you to Dr. Yungfei Kao for all the statistical guidance. Thank you to all the faculty professors from the beginning of my DNP program for their unmeasurable commitment to my education thus far, which has pushed me to reach my highest potential.

I sincerely appreciate the staff at Harmony Cares Medical Group Texas for allowing me to implement my DNP project in the appropriate environment. The progress of this project could not have been possible without the support and guidance of the leadership from Harmony Cares Medical Group Texas; their tremendous support resulted in improved quality improvement measures. I am grateful for the support and guidance of Oluwatosin Alonge, clinical director at Freedom Community Medical Clinic, for providing solid support and encouragement throughout this portion of my educational journey and for the opportunity to volunteer at the clinic. Dr. Modesta Garcia-Atwater, my esteemed preceptor and cheerleader, you have provided me with a late-night listening ear, constant encouragement, and a reminder that I'm almost there; thank you.

To my incredible support system- my parents, sister, spouse, and daughters, I got to this point with you all; thank you for your unending love and encouragement throughout my educational career. Nathania and Nasia, you have inspired me, and I thank you for your understanding and patience. I hope I have set an example to inspire you to surpass all the academic boundaries this life sets forth. Thus, I dedicate this project to you both. Above all, I thank God Almighty because "all things were made possible" (Mark 10:27) with him.

Abstract

Context: Early serious illness conversations related to end-of-life and goals of care with seriously ill patients have been associated with improving patients' outcomes and quality of care (Bernacki et al., 2015). However, initiating these serious illness discussions has been challenging in the home-based primary care setting.

Objectives: To train and support home-based primary care clinicians in integrating best practices in serious illness discussions and decision-making engagement among patients sixty-five and older with serious illnesses, optimize the alignment between patient goals and the medical care they receive, improving their quality of life and the rate of palliative care and hospice referrals.

Methods: A pragmatic before-and-after quality improvement descriptive pilot study design analyzed data survey to gauge clinicians' confidence levels and capability to initiate serious illness discussions. A qualitative survey was used to collect clinicians' responses to highlight the importance of on goal-based communication skills education and training. Palliative care and hospice referral rates data were collected six months before implementing the prognosticator algorithm bundle and compared to the data for the 8-week change intervention period and after. The methodology for the quality improvement project was explained to all clinicians, and weekly sessions with clinicians were held to safeguard proper training and education on serious illness discussions via PowerPoints, handouts, brochures, flyers, and videos. Monthly data collection was conducted from QuestionPro and the Regional Director of Operations for palliative care and hospice. A t-test and analysis of variance were used to assess the effectiveness of the Prognosticator Algorithm Bundle. The data were analyzed using QI Macros 2024 software.

Results: Seven Clinicians' level of confidence in the initiation of serious illness discussions were collected in an independent samples t-test comparing pre-test and post-test mean and variance of the goal-based communication skills training intervention, which showed a significant increase in confidence and independence in the initiation of serious illness discussions with t = 2.447, df = 6, 95% Cl, P < 0.0001. One hundred twenty-three patients with an average age of 77.7±14.2 years participated in this study. The intervention showed a significant change in the rate of referrals to both palliative and hospice using analysis of variance (ANOVA)- (F= 76.96; P= 0.00001) as well as hospice referral rate (F= 9.127; P= 0.02336). This difference is considered to be extremely statistically significant.

Conclusion: According to the findings of this study, there is a relative increase in serious illness discussions when clinicians are trained and educated on goal-based communication skills — indicating a direct relationship between the two variables. Home-based primary care clinicians' readiness for advance care planning increases the rate of palliative care and hospice referrals. Therefore, implementing the use of prognosticator algorithm bundle intervention to improve the readiness of the home-based community clinicians on advance care planning through early initiation of serious illness discussions results in an increased rate of palliative care and hospice referrals and improved quality of life by providing patient-centered and family-focused care through palliative care and hospice services.

Keywords: *Serious illness, Advance care planning, Palliative care, Hospice, End of life, Goals of care*

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals

Background

Serious illnesses are chronic medical conditions such as congestive heart failure, chronic liver disease, cancer, dementia, chronic kidney disease, autoimmune diseases, and chronic respiratory disease that are treatable (Mechler & Liantonio, 2019). Though treatable, treatment will not guarantee recovery or improvement of the prognosis (Batten et al., 2019). Hence, there is a need for an advance care planning conversation that prompts clinicians to prepare patients and families for serious illness discussions— goals-of-care (GoC) and end-of-life (EoL). Though palliative care and hospice clinicians are resourceful in initiating serious illness discussions, there is currently a shortage of these services in the healthcare system. With the current shortage of palliative care and hospice clinicians, it is projected that by 2030, there will be only one clinician for every 26,000 patients living with serious illness in the United States, and this workforce shortage is only expected to increase with future demographic changes and the growing aging population (Kamal et al., 2017). Serious illness diseases continue to rise simultaneously with the target population, driven by the aging baby boomers who will be older than age 65 by 2030 (United States Census Bureau, 2018). This target population in the United States is projected to reach 95 million by 2060, with an estimated population growth rate of about 83% from 52 million in 2018 (Population Reference Bureau, 2019). Limited access to specialty services such as hospice and palliative care —providing symptom management, improving patient-centered care, socio-economical support, and EoL discussions (herr et al., 2022), leads to increased morbidity and mortality rate, reduced quality of life, increased healthcare utilization, and a significant burden on economic, caregivers, and family members

(Osenenko et al., 2022). Similarly, the World Health Organization (2020) reported that an estimated 56.8 million individuals, including 25.7 million in the last year of life, annually need palliative care. However, 86% of these individuals who need palliative care do not receive it (World Health Organization, 2020).

Hence, non-palliative care clinicians must integrate essential measures in treating patients with serious illnesses to promote serious illness discussions (Bernacki et al., 2015). Most patients do not understand that not making decisions on end-of-life and goals of care invariably indicates that they have made the decision for their healthcare providers or family members to make informed decisions related to their care. Healthcare providers and family members tend to focus care on critical and drastic measures to keep patients alive, including cardiopulmonary resuscitation, intubation, and feeding tube insertion, rather than on the patient's goals, values, and wishes (Bernacki et al., 2015). Therefore, it is pertinent for patients with serious illnesses to have these discussions with their healthcare providers and family when they are capable of making decisions and also refer to appropriate specialty care services based on their prognosis.

However, most clinicians are unprepared for serious illness discussions because the training remains limited or nonexistent at nursing schools and the healthcare systems (Martin et al., 2022). On the other hand, patients find serious illness discussions sensitive and emotionally challenging to converse (Xu et al., 2022). Serious illness discussion intervention has been shown to improve patients 'outcomes, quality of life, achievement of goals of care, and decrease hospitalization and readmission rates (Osenenko et al., 2022). By engaging in these discussions, patients can express their values, beliefs, and wishes for care, ensuring their autonomy and dignity are respected. Central Ohio analysis of 30,000 data from October 2015 and June 2016 showed that residents who received end-of-life intervention had a significant reduction in hospital admissions at 33%, ICU admissions at 38%, hospital stay days at 12%, and total medical cost at 20% (Yosick et al., 2019). This Doctor of Nursing Practice (DNP) quality improvement project focused on implementing the prognosticator algorithm bundle to improve clinicians' knowledge and skills and increase serious illness discussions in patients with serious illnesses aged 65 and older in the home-based community setting (private residences and long-term facilities). The quality improvement project also aims to increase the rate of palliative and hospice referrals in patients aged 65 and older with serious illnesses.

Gap Statement

Currently, in the United States, twelve million adults are living with a serious illness, such as heart disease, cancer, lung disease, or kidney disease. By 2035, 81% of patients with serious illness aged 65 and older are estimated to be at seventy-eight million due to the growing aging population (Center to Advance Palliative Care [CAPC], 2019a). Having serious illness discussions will significantly increase patients' quality of life, cost savings from avoiding costly institutional care through early palliative and hospice referrals (Shepperd et al., 2016), and substantially reduce unwanted treatments and procedures, hospitalizations, and emergency visits (Stall et al., 2014). The initiation of serious illness discussions intervention can help alleviate the burdens patients and their families face, enhancing care and improving their quality of life. However, this intervention is seldomly utilized due to limited community awareness, misconstruing hospice care interventions, lack of trained healthcare professionals, and lack of coordination and communication between healthcare providers involved in caring for this target population with serious illnesses (Morris et al., 2021). Recently, as of 2021, only 23% of patients with serious illnesses in the United States have had serious illness discussions (Vossel, 2021).

Gap Analysis

The impact of serious illnesses on the elderly population leads to increased morbidity and mortality rates, reduced quality of life, increased healthcare utilization, and a significant burden on the economy, caregivers, and family members (Osenenko et al., 2022). However, having discussions about serious illnesses helps alleviate these burdens. Serious illness discussions are patient-centered and family-focused; when not provided, situations such as ethical and legal dilemmas arise; (1) families unintentionally disregard what is best for the patient and seek life-prolonging measures, (2) deprive patients of absolute autonomy of care, (3) resulting in unwanted health care interventions, (4) prolong patients' suffering, (5) family burden, and (6) making the role of advocacy challenging for the nurses and healthcare providers (Martin et al., 2022). Having serious illness discussions helps reduce hospital admission by 50%, 30-day readmission rates by 48%, emergency department visits by 35%, intensive care unit utilization, and save 9-25% of costs for each inpatient stay (Parker, 2020). Also, initiating serious illness discussions early in the serious illness trajectory, when the patient is in stable health and surrounded by families, will increase participation in serious illness discussions, and promote palliative care and hospice referral (Gonella et al., 2019) compared to cases where serious illness discussions are initiated quite late in the illness trajectory when the patients are in the hospital, in a very high stressed environment with strangers, then discussing a sensitive topic such as end-of-life and goals-of-care becomes challenging.

Having serious illness discussions enhances communication, improves emotional response and understanding of ethical principles, and manages symptoms and the trajectory of death (Martin et al., 2022). It also provides the situation to discuss palliative care and determine the timing of hospice referral (Sanders et al., 2022). Serious illness discussions are either never initiated or initiated late into the serious illness trajectory. Hence, there is a need for advance care planning on serious illness discussions to be reappraise, leading to the development of change in process from no advance care planning to using a prognosticator algorithm bundle: education and training, prognostic tool- CHESS scale, and serious illness conversation guide to optimizing patients care and promoting serious illness discussions, palliative care, and hospice referral. This intervention provided tailored treatment plans to align with patient's preferences, ensuring that care is focused on improving quality of life and managing symptoms effectively. The comprehensible prognosticator algorithm bundle allowed clinicians access to focused education and relevant tools to promote serious illness discussions and patients' healthcare preferences and wishes.

Data to Support the Gap

According to the 2019 report on hospitals in the United States (U.S.) serving 87% of all hospitalized patients with fifty or more beds. With grading based on provision of palliative care services in the following ranges: A: 80% or more; B: 60%-79%; C: 40%-59%; D: 20%-39%; and F: less than 20% (CAPC, 2019a, 2019b):

- United States reported 72% (grade B).
- Texas (TX) reported 52% (grade C).
- Texas urban reported 49% (grade C), suburban areas at 25% (grade D), and rural regions at 15% (grade F).

DiJulio et al. (2017), national survey conducted between May and July 2017, 44% of patients with serious illness aged 65 and older had serious illness discussions, and 60% of these patients who had serious illness discussions had documented their GoC and EoL wishes. On the other hand, only 21.4% of community clinicians in Texas could provide EoL discussions to patients with serious illnesses (CAPC, 2019a). Locally, at an outpatient oncology facility, 90% of patient with serious illnesses reported that having serious illness discussions was valuable to their treatment plan, 55% reported that the discussions increased their understanding of their future health, and 58% reported that having the discussions increased their sense of closeness with their clinicians (Kumar et al., 2020).

Review of Literature and Synthesis

Search Strategy and Selection Criteria

Search criteria included the following keywords: "palliative care," "serious illness conversation," "prognostic tool," "CHESS scale," "home-based," "elderly patient," and "end-of-life." Using the Boolean "AND," "OR," and "NOT," this search excluded studies related to the pediatric population. The search was limited to English and publications between 2013 and 2023. The databases used were CINAHL Complete, MEDLINE, and Psychology and Behavioral Sciences from nursing, medicine, and psychology. A total of 13 studies were included in the evidence table (see Appendix B) ranging from level of evidence of I to III, with systematic reviews and randomized controlled trials (RCT) lending the strength of the findings.

Importance of Education and Training

Most sources suggest that providing effective serious illness discussions begins with educating clinicians and focusing on goals-based communication. Bernacki et al. (2015) discovered that providing clinicians with structured training and educational programs on serious illness discussions helped improve their patient-centered communication skills. Also, Dudley et al. (2022) reported that more than 50% of clinicians need to develop their goal-based communication skills to improve serious illness discussions. Dudley et al. (2022) and Sekar et al.

(2021) reported that serious illness communication via education and training intervention, specifically increased knowledge, self-efficacy, initiation of serious illness discussion, and communication skills in clinicians practicing in long-term and community-based settings and improved patients with serious illness confidence in their GoC and EoL decision making. These outcomes were achieved through a well-established, evidence-based curriculum available to clinicians to educate and train on serious illness discussions.

In addition, evidence supporting the goal-based communication skills training for clinicians was collected in an independent samples t-test comparing pre-test and post-test mean and standard deviations of the communication skills training intervention, which indicated a statistically significance value of <0.05 in clinicians' confidence and independence in the initiation of serious illness discussions (3.6 ± 0.9 vs 4.1 ± 0.6, $P< 0.001$) and code status discussion (3.6 ± 1.0 vs 4.0 ± 0.7, $P< 0.001$) (Sekar et al., 2021). On the other hand, Dudley et al. (2022) identified the importance of education and training in goal-based communication skills to improve serious illness discussions among clinicians, as all thirty-four clinicians who participated in the community health nursing educational training program identified that the training had a positive impact in their self-efficacy in initiating serious illness discussion.

The Strategic Assessment Tool

While goal-based communication skills are essential to promote serious illness discussions, having a strategic tool will further help to determine the appropriate time to initiate serious illness discussions. In Dudley et al. (2022), more than 90% of clinicians reported that detailed assessment intervention provides more structure than using only communication skills to ease the flow of serious illness discussions. The strategic assessment tool is a prognostication measure that allows for timely discussion of treatment options, end-of-life, goals-of-care discussions, and palliative care referrals (Hum et al., 2020). The changes in health, end-stage disease, signs and symptoms (CHESS) Scale (see Figure C1) is a decision-support tool available to clinicians that can be used to estimate prognosis in the illness trajectory. The CHESS scale is an accurate strategic assessment tool used frequently in studies and found to be consistent with the validity content and interrater reliability of clinical findings to improve the initiation of serious illness discussion (Sinn et al., 2020; Williams et al., 2022).

The CHESS scale was used to measure against other assessment tools by Sinn et al. (2020) and Williams et al. (2022) and was reported to be an effective intervention tool in predicting death and hospitalization within 90 days in patients with serious illnesses, thereby promoting timely initiation of serious illness discussions. Williams et al. (2022) recommended using the CHESS scale proactively to assess and document the ongoing findings in patients with serious illnesses. This process promoted the development of individualized care plans and early initiation of serious illness discussions, palliative care specialty, and determining hospice eligibility (Williams et al., 2022). According to Sinn et al. (2020), the CHESS scale is sufficient for predicting death and hospitalization in patients with serious illnesses— after conducting a comprehensive geriatric assessment on 228.679 patients using the CHESS scale, 7.3% death, 16.6% hospitalization, and 44.4% emergency department visits were recognized within 90 days of assessment. A justification for delayed communication about serious illness discussions was reported to be influenced by the lack of implementation of appropriate strategic assessment tools (Gonella et al., 2021).

End-of-Life Signs and Symptoms to Support Serious Illness Discussions

Clinicians must be able to identify signs and symptoms of impending death to utilize strategic assessment tools effectively. Williams et al. (2022) explored and reported that the

CHESS scale prognostic tool was accurately used to identify the transition to imminent death, which promoted the initiation of serious illness discussion. The CHESS scale was to assess 80,261 patients and the result indicated that patients who had a score of 0 had a probability of survival to 90 days at 92%, while those with a score of 5 had a survival rate dropped to 38%. There is a two-fold increased mortality risk within 90 days for every one-point increase on the CHESS Scale (Williams et al., 2022).

Kehl and Kowalkowski (2013) discovered that using an appropriate prognostic tool when assessing and documenting played a significant role in the reliability of signs and symptoms findings. Kehl and Kowalkowski (2013) conducted a systematic review study that discovered that clinicians who assessed and documented patients' signs and symptoms at every encounter paid close attention to changes and deterioration in the patient's health conditions, which prompted early serious illness discussions. Findings from the study identified forty-three unique signs and symptoms of impending death. The highest prevalence signs and symptoms were dyspnea (56.7%), pain (52.4%), respiratory secretions/death rattle (51.4%), and confusion (50.1%) (Kehl & Kowalkowski, 2013).

Relevance of Using Serious Illness Conversation Guide

Having serious illness discussions will systematically address patients' health conditions, clinical prognosis, care goals, and how to achieve them while explaining the risks and benefits of potential treatments (Gonella et al., 2019) and prognosticating the impending symptoms of death is paramount for clinicians' assessment in initiating serious illness discussions by using the serious illness conversation guide (SICG) (see Figure C2) (Sanders et al., 2022). It was reported that the serious illness conversation guide promoted timely discussion of palliative care. It predicted hospice referral with support for patient-centered and family-focused care and preventing unwanted treatments and procedures (Sanders et al., 2022).

According to Paladino et al. (2022) and Sanders et al. (2022), an established healthcare system that supports clinicians training and coaching on serious illness discussions and the use of serious illness conversation guide has been shown to increase clinicians' knowledge and self-efficacy and changes in healthcare utilization to patient-centered care. Gonella et al. (2019) systematic review reported that initiating serious illness discussions by clinicians had been shown to decrease the provision of aggressive care treatment, length of hospital stays, and in-hospital deaths and increase families' satisfaction and patients' quality of care. Having serious illness discussions has been tested and reported to increase limitation and withdrawal from life-sustaining treatments, at an average of 56%, whereas families who did not receive the discussions are up to 6-fold more dissatisfied with end-of-life care (Gonella et al., 2019; Paladino et al., 2022). Delgado-Guay et al. (2016) and Sanders et al. (2022) discovered that using the serious illness conversation guide improved honoring patients' end-of-life wishes and sense of control, facilitated end-of-life decision-making, and ultimately provided the patient with a “good death.” Gonella et al. (2019) revealed studies related to the benefits of serious illness discussions and reported that patients with serious illnesses were able to; (1) discuss their life-sustaining treatments or care goals, (2) state their advance directive wishes, (3) identify invasive treatments limit, and (4) signify their psychological, spiritual, and existential problems.

Significance of Home-Based Community Care

A systematic review study by Shepperd et al. (2016) reported that patients with serious illnesses would prefer to receive end-of-life care at home, given adequate support from palliative care services. Effective end-of-life care at home promotes the delivery of active continuous care by trained clinicians, the use of relevant assessment scales, prognostic tools, SICG, and home-based palliative and hospice care with PWSI in the comfort of their homes rather than hospital inpatient burdensome treatments and family limited engagement in care (Sanders et al., 2022; Shepperd et al., 2016).

A unique systematic review study by Stall et al. (2014) found and reported that home-based care intervention influenced the establishment and quality of communication that supported early serious illness discussions. Gonella et al. (2021) and Stall et al. (2014) studies have demonstrated a significant increase in quality of care, cost savings from avoiding costly institutional care, a substantial average of 30% reductions in hospitalizations, and fostered shared decision-making when serious illness discussions are utilized effectively at home. Stall et al. (2014) reported one-year cost savings of more than one million dollars, with fewer hospitalizations accounting for 98% of these savings, and 97.3% of patients in the home-based community had documented advance directives. Providing serious illness discussion in the home-based community would help maintain patients' quality of life and function, especially in older adults with serious illnesses, and the overall sustainability of healthcare systems (Stall et al., 2014). Therefore, a quality improvement (QI) project of prognosticator algorithm bundle is needed to improve clinicians' knowledge and skills in initiating serious illness discussions and improving the rate of palliative and hospice referrals in home-based community settings.

Project Question

Does implementing prognosticator algorithm bundle (education and training, prognostic tool-CHESS scale, and serious illness conversation guide) compared to no advanced care planning improve serious illness discussions (goals-of-care and end-of-life) and the rate of palliative and hospice referrals in patients with serious illnesses aged 65 and older over eight weeks in the home-based community (private residences and assisted living facilities)?

***Objectives*:**

- Improve clinicians' knowledge and skills in serious illness discussions.
- Increase the rate of serious illness discussions and decision-making engagement among patients with serious illnesses, and rate of palliative care and hospice referrals.
- Improve the quality of life of patients with serious illnesses by providing patient-centered and family-focused care.
- Evaluate the effective of using prognosticator algorithm bundle to improve the rate of serious illness discussions and referrals rate in the home-based community.

Framework

The quality improvement methodology for this DNP project is the Model for Improvement framework (see Appendix D). In 1996, the associates for process improvement at the Institute for Healthcare Improvement partner organization expanded on the plan-do-study-act (PDSA) cycle that Walter Shewhart and W. Edwards Deming developed in 1939 to create the model for improvement framework.

According to the Institute for Healthcare Improvement (n.d.) and Johns Hopkins Medicine (2022), the model for improvement framework has two major components (3-fundamental questions and the PDSA cycle), which are identified in the following 4-steps:

Aim: The aim statement focuses on four questions: What are you trying to accomplish? Who is the improvement for? How much improvement needs to be made? When will the improvement be attained? The aim of this QI project is to improve the early initiation of serious illness discussions and the rate of palliative and hospice care referrals in patients with serious illnesses aged 65 and older living in home-based community settings.

Measurement: Four types of measures (structure, process, outcome, and balancing) are used to determine if the improvement change is effective. The measurement for this quality improvement project involves the target population in the home-based community. The process measured the use of the prognosticator algorithm bundle for serious illness discussion, and the outcome measured the rate of palliative and hospice referrals.

Change: Before the intervention, it was pertinent to discover the cause of the problem by conducting a root cause analysis (RCA). For this quality improvement project, a root cause analysis was completed, and it determined that a lack of serious illness discussions results in a low rate of palliative and hospice referrals. The prognosticator algorithm bundle a quality improvement intervention change was developed after searching and selecting the appropriate interventions from evidence literature databases.

PDSA cycle: The change was implemented in a small-scale setting. The project lead used the PDSA cycle to plan by identifying stakeholders and develop the interdisciplinary project team. The interdisciplinary team include the system leadership and technical experts such as physicians, nurse practitioners, nurses, and social workers. The clinicians participated in an hour of weekly training and education sessions (see Appendix F). Feedback (see Appendix G) and Likert scale-based survey questions (see Appendix H) were collected weekly to evaluate the change process. Do a pilot study within the pod group on a small scale and studied the results by collecting and documenting data and comparing results to predictions. The act phase was based on the results from the study by adopting, adjusting, or abandoning. However, the change intervention was adopted. The PDSA worksheet (see Appendix E) was used to help the practice stay on track.

Methods

This pilot study explores the feasibility and the impact of the quality improvement project using the prognosticator algorithm bundle to initiate serious illness discussions and increase the rate of palliative care and hospice referrals in patients 65 and older living with serious illness in the home-based primary care setting. The organization selected for this project is a home-based healthcare system that provides care for older adults and those with complex medical issues in Texas.

The organization's strengths, weaknesses, opportunities, and threats (SWOT) in relation to this project is the toolkit implementation with certain internal strengths and weaknesses and external opportunities and threats (see Appendix N); S- Promote unity and interpersonal interactions in the workplace, W- clinicians find serious illness discussions as sensitive topic to initiate, O- decrease the rate of emergency room visits and in-patient admissions, and T- decreased patients' satisfaction for patient that are not ready for the serious illness discussions. The organizational risk assessment (see Appendix Q) planning involved implementing a process that protects patient's identity, honor wishes and ensure qualifying patients are referred to palliative care or hospice as indicated while identifying risk factors that will harm the patient or result in false referrals. A weekly meeting was held with practice manager to discuss and implement strategies for ensuring continuity of safe operations and collaboration with local palliative and hospice organizations.

Population

The target population is patients with serious illnesses, who are the most vulnerable stakeholders in this project. The participants included patients with at least one chronic serious illness aged 65 and older, living in a home-based community, and who can verbally or in writing state their goals of care and end-of-life goals. One hundred twenty-three patients were included by convenience sampling. Exclusion criteria included patients younger than 65 years, without serious illnesses, and those receiving in-patient care.

Setting

This project focused on the home-based community, which included private residences and assisted living facilities. Patients with serious illnesses call this environment "home," a setting where serious illness discussions are conveyed to prevent hospitalization and honor their health wishes (CAPC, n.d.). The organization selected for this project is a home-based healthcare system that provides care for older adults and those with complex medical issues in Texas.

Measurement and Analysis

This descriptive quality improvement pilot study explores the impact of using the prognosticator algorithm bundle. Seven clinicians received weekly training on goal-based communication skills as well as signs and symptoms of serious illness via PowerPoint presentations, handouts, brochure, and videos (see Appendix F). A pre-and-post survey form (see Appendix I) was utilized for clinicians' confidence level and independence in initiating serious illness conversation. A pre-survey was completed before providing goal-based communication skill training and education, which was compared to the post-survey after completion of the intervention for the eight weeks.

Patients who need serious illness discussions were identified via the artificial intelligence end of life generated list and selected using the CHESS scale. The CHESS scale (see Figure C1) as 4 questions with scores range from 0 to 5: 0 means no health instability; 1 is Minimal; 2 Low; 3 Moderate; 4 High; and 5 means very high health instability. One hundred and twenty-three patients with score greater than 3 were identified and selected for serious illness discussions. Clinicians were provided with serious illness conversation guide (see Figure C2) to help ease and direct the conversations. SICG was used to provide goal-based communication on end-of-life and goals-of-care, thereby increasing the rate of hospice and palliative care referrals.

Procedure (Intervention)

The quality improvement intervention project was initiated to improve serious illness discussions and increase the rate of referrals to palliative care and hospice by utilizing the prognosticator algorithm bundle (see Figure A1). The new quality improvement intervention started with educating, training, and empowering clinicians with appropriate tools that aid the initiation of serious illness discussions. A weekly educational sessions were scheduled with clinicians where they were provided with power point presentations, brochure, handouts, and videos (see Appendix F). A weekly feedback (see Appendix G) and Likert scale-based survey questions (see Appendix H) were collected to evaluate if the training sessions were beneficial, and suggestions taken into considerations. Clinicians' confidence level and independence in initiating serious illness discussions were evaluated to determine if the change intervention process was effective using the pre-and-post survey form (see Appendix I), completed during the first week and the eight week of the implementation of the intervention.

On the other hand, patients were identified via the use of artificial intelligence end of life generated list and selected using the CHESS scale. One hundred and twenty-three patients who needed serious illness discussions were identified using the prognosticator tool: The changes in health, end-stage disease, signs and symptoms (CHESS) Scale, then the serious illness conversation guide (SICG) was provided to clinicians to assist in the goal-based communication discussions (see Appendix C). Patients were scheduled. Discussions and referrals completed. Referral rate data were collected via survey, questionnaire, QuestionPro, and Tableau and monthly data collection with the regional Directors of Operations for palliative care and hospice.

Statistical Analysis

The statistical analysis for the project were computed using QI Macros 2024 software. Descriptive and inferential statistics were used to analyze data, recommended by the University of Texas, Arlington statistician — Dr. Yungfei Kao. The measurement of differences between pre and post surveys utilized the paired t-tests, each t- test representing a domain of the pre-and-post survey form (see Appendix I) developed by the project lead. which answer the question of whether the intervention resulted in improved clinicians' confidence and independence in serious illness discussion. Patients' demographic data such as age, gender, and race were collected using the demographic collection form (see Appendix K). The referral rates results were evaluated using descriptive statistics one way analysis of variance (ANOVA) for comparison in between pre and post intervention referral rates.

Ethical Considerations

The University of Texas, Arlington (UTA) Graduate Nursing Review Committee (GNRC), a sub-committee of the IRB, approved the project for commencement. The DNP project ethical approach remain in compliance with the Belmont Report of three ethical principles, which are (1) respect for persons by allowing autonomy and treating subjects with respect; (2) beneficence, the fundamental principle of "do no harm"; and (3) justice, focusing on equity and non-exploitative (U.S. Department of Health and Human Services, 1979). The Human Subject Protection training was completed, and the certificate attained (see Appendix M). In compliance with ethical guidelines, there was no conflict of interest associated with the project.

Results

Project Outcomes

The pre-and-post survey form established the validity and reliability of six questions that rate clinicians' knowledge of patient deterioration and confidence in initiating serious illness discussions. The timeframe for data collection was before the start of training and at the end of the clinicians' experience, which lasted for eight weeks. Seven Clinicians level of confidence in the initiation of serious illness discussions were collected in an independent samples t-test comparing pre-test and post-test mean and variance of the goal-based communication skills training intervention showed, a significant increase in confidence and independence in the initiation of serious illness discussions with t = 2.447, df = 6, 95% Cl, P < 0.0001. Mean and variance for the pre-test were 6.42 (0.286) and post-test were 16.57 (0.9524).

Table 1

Pre and Post Survey results

Clinicians	*Q1 Pre*	*Q2 Pre*	*Q3 Pre*	*Q4 Pre*	*Q5 Pre*	*Q6 Pre*	*Q1 Post*	*Q2 Post*	*Q3 Post*	*Q4 Post*	*Q5 Post*	*Q6 Post*
1	1	1	1	1	1	1	3	3	2	2	3	2
2	1	1	2	1	1	1	3	3	3	2	3	3
3	1	2	1	1	1	1	3	3	3	3	3	2
4	1	1	1	1	1	1	3	3	2	2	3	3
5	1	1	1	1	1	1	3	3	3	3	2	2

6	1	1	1	1	2	1		3	3	3	3	3	3
7	1	1	1	1	1	1		3	3	3	3	3	2

Note. Seven clinicians pre-and-post survey form rating their knowledge of patient deterioration and confidence with the following patient / family interactions and discussing serious illness conversations.

A total of 123 patients with an average age of 77.7±14.2 years participated in this study. Of those, 56 (45.5%) were referred to palliative care and 12 (9.8%) were referred to hospice during the 8 weeks of implementing the prognosticator algorithm bundle, 5 (4.0%) death without hospice or palliative care referrals, 7 (5.7%) patients referred home from hospital on hospice, 4 (3.3%) decline serious illness discussions, and 39 (31.7%) were referred to palliative care post QI project implementation (see Figure A2). Six months prior to the QI initiative, the average monthly referral rate for palliative care was at 5.8 and hospice 1.8. This quality improvement initiative increased the monthly average referral rates in eight weeks for both palliative care and hospice services to 28 (see Figure A3) and 6 (see Figure A4) respectively. The intervention showed a significant change in the rate of referrals to both palliative and hospice; analysis of variance (ANOVA). a statistically difference in palliative care referral rate due to the QI initiative (F= 76.96; P= 0.00001) and hospice referral rate (F= 9.127; P= 0.02336). By conventional criteria, this difference is considered to be extremely statistically significant.

Discussion

In the primary care home-based setting, clinicians caring for patients with serious illnesses were concerned as these patients were frequently hospitalized or had 1-3 emergency/ urgent care visits within 1-2 months. The goal is to have symptom management at home, reduce hospitalization and emergency care visits rates, and ultimately achieve death at home surrounded by family and loved ones. The project lead concluded that knowing the patient's goals of care and end-of-life preferences will help develop an individualized plan of care and referral to the appropriate specialty care team that will provide the patients with comfort and quality of life, with an emphasis on pain relief and symptom management. The project was reviewed and approved by the Regional Chief Medical Officer and readiness assessment (see Appendix S). The utilization of the Prognosticator Algorithm bundle has helped improve clinicians' confidence in initiating serious illness discussions and rate of referral to palliative care and hospice. Which better identify patients' goals-of-care and end-of-life preferences based on the patient's prognosis and mortality risk. Hence the project lead will continue to educate and train community-based clinicians on goal-based communication skills for advance care planning and identifying patients who need end-of-life and goals-of-care discussions. The goal is to standardize the use of prognosticator algorithm bundle among medical and primary care groups for all appropriate patients with serious illnesses in Texas. In doing so, healthcare teams will work to optimize patient outcomes and enhance appropriate treatment experiences and services for this vulnerable population. Based on prior literature and results of this study, multiple recommendations should be considered. Future research could explore pertinent of the prognosticator algorithm bundle especially with the health issues that continue to rise simultaneously with patients aged 65 and older and the projected growth rate is about 83%, from 52 million in 2018 to 95 million by 2060, driven by the aging baby boomers (Population Reference Bureau, 2019).

Summary

Key Findings

This quality improvement project was used to improve the knowledge and attitudes of clinicians and the early initiation of serious illness discussions, thereby increasing the rate of referrals to palliative care and hospice. This change intervention also improves patient and family quality of life through education, decision-making, advance care planning and referral rates to the appropriate specialty team.

Clinicians' quotes post intervention: "The educational sessions and videos were insightful," "Using the SICG allows for an easy flow of communication without missing important information and deviating from the topic of discussion," and "I now feel comfortable initiating end-of-life discussions." The statistical reliable improvements in initiating serious illness discussions, referral rates to palliative care and hospice and clinicians' confidence level were noted in the post-intervention data.

This is significant for the home-based primary care providers as it indicates that using the prognosticator algorithm bundle increased referral rates to palliative and hospice services compared to standard care. The project lead will continue to provide weekly goal-based communication skills training and use of CHESS scale paper trail until the stool is incorporate into the assessment database system for easy identification of patients that need serious illness discussions and appropriate referrals. Future research is needed to better identify the impact of implementing the prognosticator algorithm in outpatient primary care, hospital setting, and specialty clinics.

Limitations

The project was limited for a short intervention duration which was eight weeks. The duration was not long enough to process the intervention impact of the quality improvement project extensively. The sample size was a challenge and weakness for this project as the small sample size may not be appropriate for population generalization. The project was carried out at single sites with no control group and no randomization, constituting a weak type of design, thus limiting generalizability. For the above reasons, the findings of the study may not be generalizable for theory

Serious illness discussion is a very sensitive topic that most clinician find difficult to initiate, hence the self-reporting surveys and questionnaires by the clinician was not controlled for possible response bias. Awareness of the possibility for bias and remaining neutral during the intervention process were ways the project lead attempted to reduce the bias. Moreso, the study did ask about clinicians' feelings regarding the topic of discussion, and no support systems were made available during and after the intervention to gather clinicians' feeling and emotions experience and how the experience impacted their personal, religion, and emotional wellbeing.

Conclusion

Prior negative interactions, stigma associated with serious illness discussions, lack of training in the healthcare system, and perceived self-efficacy contributing to devaluation of advance care planning and represent several of many factors that influence early initiation of serious illness discussions (Xu et al., 2022). A continuous proactive approach will improve early identification of patients that need advance care planning discussions and referral to palliative care or hospice. The CHESS scale is a dependable prognostic tool to be used in identifying patients' health instability and risk of mortality. The CHESS Scale scores range from 0 to 5 and it is used to detects frailty and health instability and was designed to identify patients at risk of serious decline. Higher scores indicate higher levels of medical instability and are associated with adverse outcomes such as mortality, hospitalization, pain, caregiver stress and poor self-rated health. (Sinn et al., 2020). The use of SICG has help clinicians with framing serious illness discussions with a focused and more intended purpose on the goals-of-care and end-of-life discussions. Findings regarding goal-based communication skills and early initiation of serious illness discussions combined with evidence of SICG among clinicians has shown to improve initiatiation of serious illness discussions, aimed at increasing referral rates.

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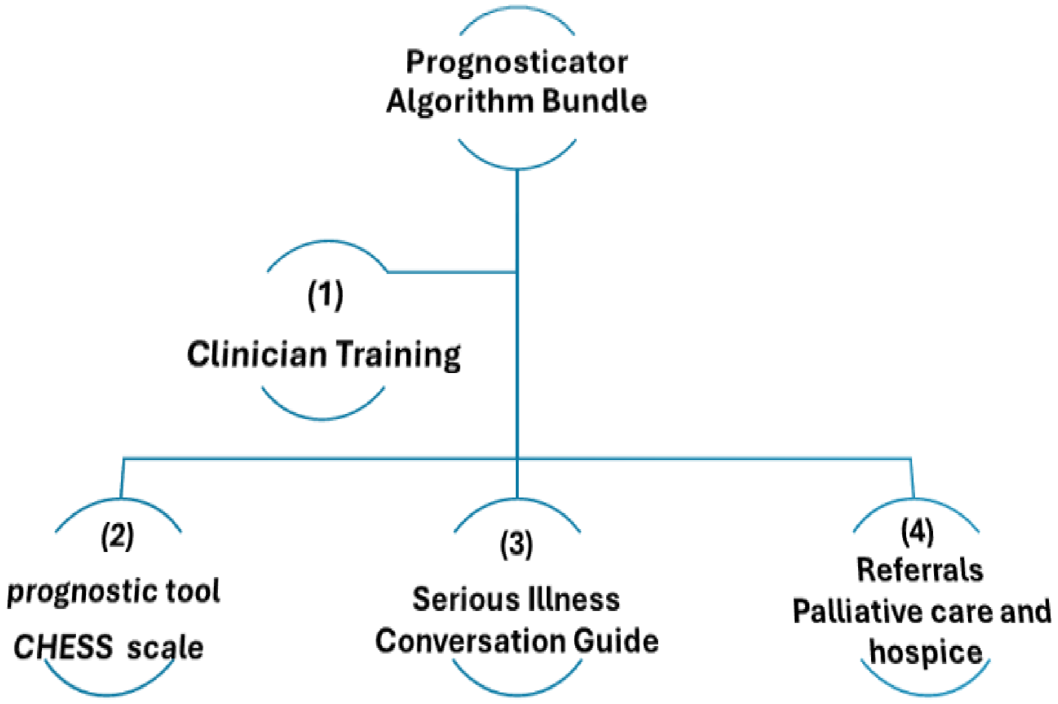
Appendix A

Figure A1

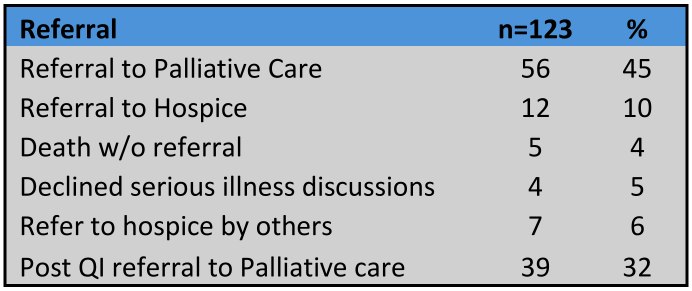
Quality Improvement Intervention: Prognosticator Algorithm Bundle



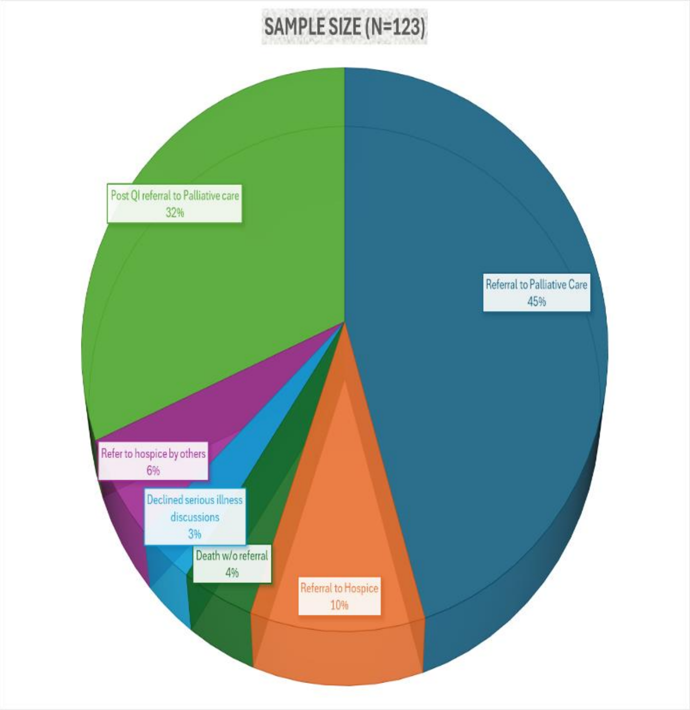
Note. The DNP quality improvement intervention, the prognosticator algorithm bundle showing step 1 through 4 of the process.

Figure A2

Patients Simple Size and Referral Rates



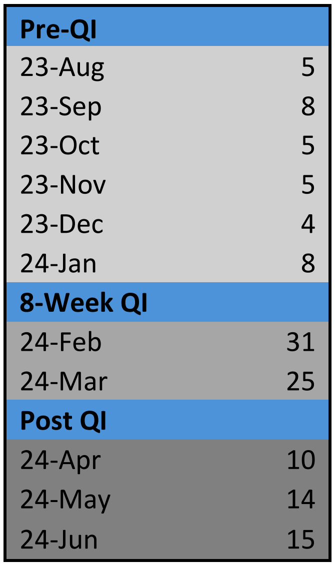
Referral	n=123	%
Referral to Palliative Care	56	45
Referral to Hospice	12	10
Death w/o referral	5	4
Declined serious illness discussions	4	5
Refer to hospice by others	7	6
Post QI referral to Palliative care	39	32



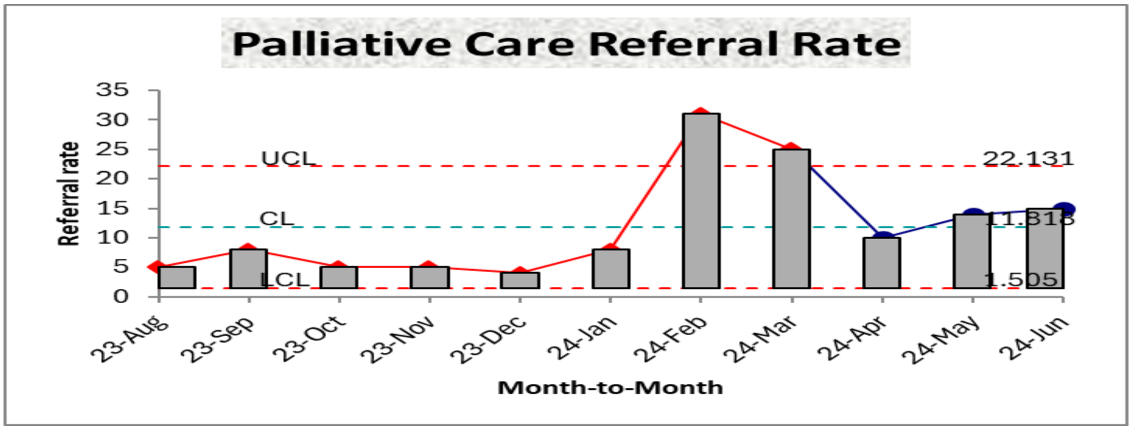
Note. The project sample size indicating the referrals within the 8 weeks of intervention and post intervention.

Figure A3

Palliative Care Referral Rate



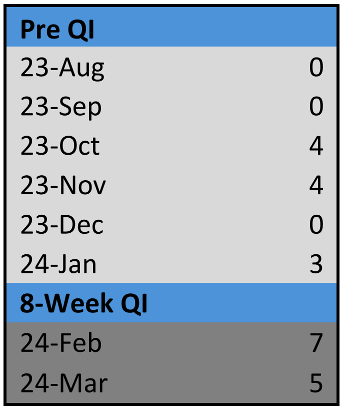
Pre-QI	
23-Aug	5
23-Sep	8
23-Oct	5
23-Nov	5
23-Dec	4
24-Jan	8
8-Week QI	
24-Feb	31
24-Mar	25
Post QI	
24-Apr	10
24-May	14
24-Jun	15



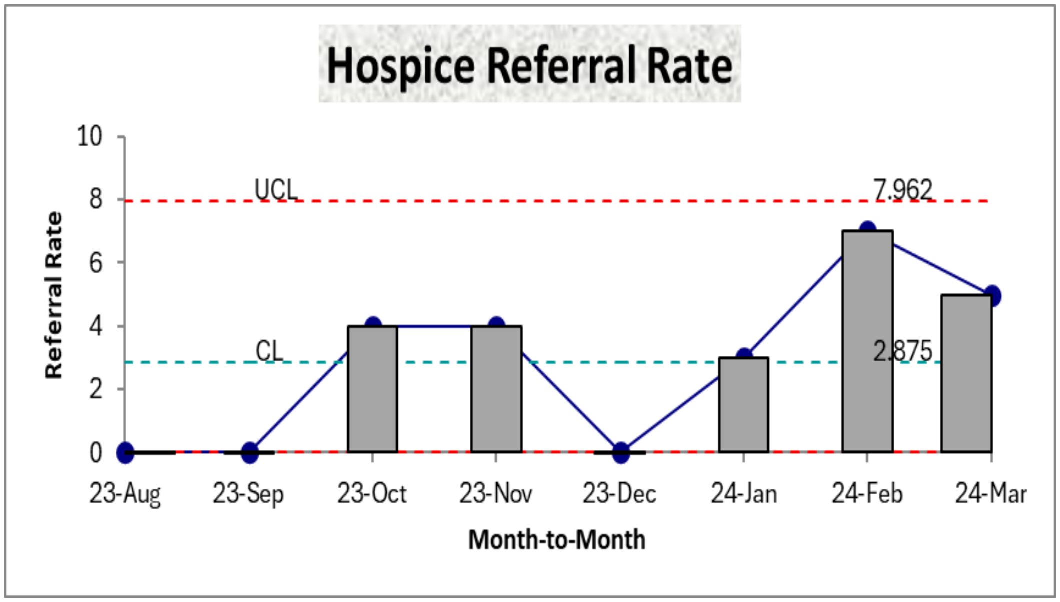
Note. Pre and post intervention referral rates to palliative care services.

Figure A4

Hospice Referral Rate



Pre QI	
23-Aug	0
23-Sep	0
23-Oct	4
23-Nov	4
23-Dec	0
24-Jan	3
8-Week QI	
24-Feb	7
24-Mar	5

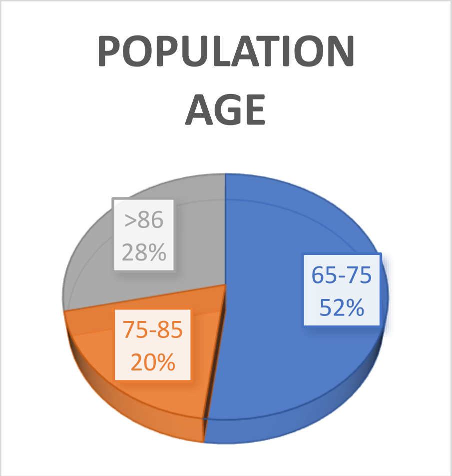


Note. Pre and post intervention referral rates to hospice services.

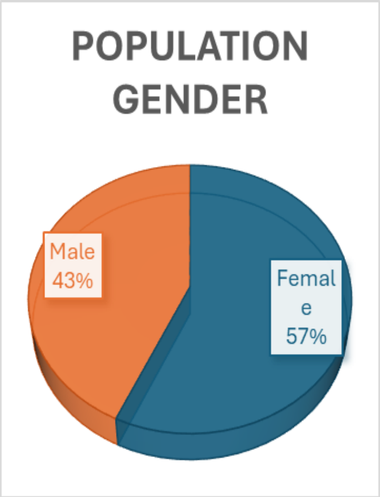
Figure A5

Population Age, gender, and Race

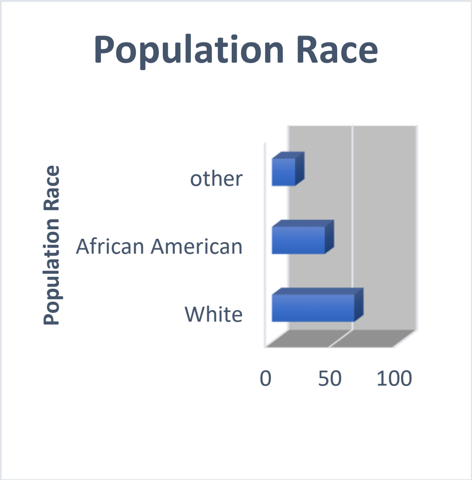
Population Age	n=123	%
65-75	64	52
76-85	24	20
86- 114	35	28



Population Gender	n=123	%
Female	70	57
Male	53	43



Population Race	n=123	%
White	64	53
African American	41	33
other	18	14



Note. The population sample size by age, gender, and race.

Appendix B

Table 1

Evidence Appraisal Table

#	Author Citation	Design & aim or hypothesis & Major Variables	Population & Setting & Sample Size	Intervention	Measurements (e.g., tool to assess outcome)	Results &/OR Recommendations	Strengths & Limitations	Level of Evidence
1	Bernacki, R., Hutchings, M., Vick, J., Smith, G., Paladino, J., Lipsitz, S., Gawande, A. A., & Block, S. D. (2015).	Clustered RCT-CINAHL The study aimed to evaluate whether, the serious illness conversation program will help patients with cancer achieve healthcare goals and quality of life in the setting of serious illnesses. Variables: serious illness conversation, wishes, cancer patients, EoL wishes	Population: Advanced incurable cancer patients with life expectancy of <12 month. Setting: Dana-Farber Cancer Institute and two affiliated satellite clinics. (n=26)	Providing serious illness conversation program to provider and determine if this will promote serious illness discussions	GEE Wilcoxon rank-sums core test & the Rao-Scott$\chi 2$	Result: Patient receipt of goal-concordant care, and peacefulness at the end of life. Recommendations: Large population size and diversity. Clinician to focus these critical conversations on patient goals, values and wishes.	Strength: No publication bias was detected. Limitation: The study was limited to analyzing the data of the patients who agreed to participate in the trial.	II

2	Delgado-Guay, M., Rodriguez-Nunez, A., De la Cruz, V., Frisbee-Hume, S., Williams, J., Wu, J., Liu, D., Fisch, M., Bruera, E., Delgado-Guay, M. O., & Fisch, M. J. (2016).	RCT- CINAHL The study aimed to determine the EoL wishes of patients with advanced cancer and to compare patients’ preferences between the Go Wish card game (GWG) and the List of wishes/statements (LOS). Variables: EoL wishes, advanced cancer patients, EoL preference methods	Population: Advanced cancer patients aged 18 years or older. Setting: Inpatient acute palliative care unit. (n=100)	Using two EoL preference tools to explore patients’ EoL wishes and anxiety to promote EoL prioritization and determine if patients consider EoL conversations beneficial.	SAS software, version 9.3. (State-Trait Anxiety Inventory (STAI).	Result: GWG was a feasible way to prioritize patients’ EoL wishes and did not increase anxiety. Recommendations: Future research should consider involving a larger population with more diversity; also evaluate findings in different geographic regions. At national and international levels, multicenter prospective studies will increase the understanding of EoL wishes of patients with advanced and terminal illnesses in a multicultural setting.	Strength: Findings were consistent and reassuring that either of the tools could be used according to the patient’s preference. Limitation: The study was limited by using a single institution setting.	I
3	Dudley, N., Rauch, L., Adelman, T., & Canham, D. (2022).	Qualitative descriptive study- CINAHL. The study aimed to address the gap in knowledge related to palliative care education in	Population: Undergraduate senior nursing students caring for older adults with serious	Curriculum reform and learning opportunities provided to improve serious illness communication skills and cultural	The National Consensus Project (NCP) for Quality Palliative Care guideline	Results: Palliative care education in community health nursing improves serious illness communication skills and assessment skills in primary palliative care.	Strength: The assessment guide provided more structure for students to conduct conversations and assess patient knowledge, behavior, and status regarding their	III

		community health practice. Variables: PC education, nursing, community health, cultural competency, serious illness.	illnesses. Setting: Community health sites (n= 34)	competency necessary to support shared decision-making with serious illness patients.	The Omaha System. Pre-and-post student confidence level survey.	Recommendations**:** A standardized measure of quality and outcomes for primary palliative care curricula in undergraduate nursing education. Educate the nursing workforce to enable serious illness patients in the community to adopt effective self-management.	primary palliative care needs. It was used in a multicultural ethnicity group. Limitations: participants need more practice in developing communication skills. The participants were from a single undergraduate program in community health nursing and lacked knowledge of diverse cultures and cultural beliefs about serious illness.	
4	Gonella, S., Basso, I., Clari, M., Dimonte, V., & Di Giulio, P. (2021).	Qualitative study- Psychology and Behavioral Sciences Collection. The study aimed to explore nurses' perspectives on how the EoL	Population: Nurses present during the last week of life of residents whose family carers	Influencing and establishing quality EoL communication and depicting the characteristics and potential mechanisms of EoL	ATLAS.ti software version 6.2	Result: The study identified that providing high-quality and timely EoL communication between healthcare professionals and family carers impacts the goal of EoL care in patients with serious	Strengths: Each interview took place in a private room and excluded individuals not relevant to the study. This study provided insight into the nursing perspective of EoL	III

		communication process impacts the goal of EoL care in nursing home residents. Variables: EoL communication, nursing home, nurses' perspectives	spent the last 30 days with them and died between 45 days to 9 months. Setting: Nursing homes (N= 14)	communication while achieving curative-oriented and palliative-oriented care goals.		illnesses. Recommendations: Use of large population size, engage nurses with palliative care education, as this will impact the result on communication skills.	communication between healthcare professionals and bereaved family carers. Limitations: Family understanding depended on the amount of information provided. Participants of this study were representative of the day shift workforce, and their perspectives may differ from that of nurses working night shifts.	
5	Gonella, S., Basso, I., Dimonte, V., Martin, B., Berchialla, P., Campagna, S., & Di Giulio,	Systematic review with meta-analysis – CINAHL. The study aimed to evaluate the association between health care professionals-residents and	Population: Health care professionals-residents (without oncologic disease), residents-family member	Healthcare professionals promoted early intervention of family involvement in EoL conversations, resulting in the decreased provision of aggressive care,	R v 3.3.3 statistical software. Funnel plot and Egger test. Moilanen's appraisal criteria.	Results: EoL conversations promote palliative care. However, family members with a higher level of education were less influenced by EOL conversations. Recommendations: Further studies should be conducted to focus	Strength: No publication bias was detected. Limitations: Characteristics of EoL conversations were largely unreported; thus, the study needed to explore whether the different definitions	II

	P. (2019).	health care professionals-family EOL conversations and EOL care outcomes. Variables: EoL conversation, life-sustaining treatment, EoL care, palliative care, family caregivers.	Setting: Nursing homes (n= 16) articles	increased families' satisfaction, and reduced in-hospital deaths. .		on the association between EOL conversations and dying symptoms with advanced chronic illnesses. Furthermore, exploring whether and how differences in the structure of conversations affect EoL care outcomes.	(e.g., speaking, discussion, talk) implied differences in conversation structure. Unmeasured confounders like medical or NH culture or religious attitudes may have accounted for the association between EOL conversations and the decision to limit or withdraw life-sustaining treatments.	
6	Hum, A., Wong, Y. K. Y., Yee, C. M., Lee, C. S., Wu, H. Y., & Koh, M. Y. H. (2020).	Cohort study-MEDLINE. The study hypothesized that a prognostic risk model for patients with advanced cancer (PRO-MAC) tool could be used for early survival prediction to develop supportive care and facilitate	Population: Patients diagnosed with chronic advanced cancers, median aged 73. Setting: Single tertiary teaching hospital.	Clinicians used prognostic tools to determine advanced Cancer patients' functional status and disease-related factors while identifying high-risk patients with 90-day mortality.	Stata V.14.1. Multivariate Cox proportional hazards regression model. Chi square test, t-test.	Result: PRO-MAC helped physicians identify patients' survival timeframes according to risk with greater accuracy and improved the accuracy of prognosis and care. Recommendation: Further studies should consider combining clinician prediction of survival with prognostic factors to improve the accuracy	Strengths: A larger population of patients who need support and use of the prognostic tool for easily accessed and evaluation by healthcare providers in oncological and palliative disciplines. Limitation: PRO-MAC was developed and validated in a	II

		multidisciplinary and mutual decision-making. Variables: Advanced cancer patients, PC prognostic tools, clinicians	(N=840).		Wilcoxon rank sum test.	of prognosis; this was not specifically studied in the development process of the PRO-MAC model.	tertiary care teaching hospital and incorporates biological variables, which may limit its accessibility in the home care and hospice setting.	
7	Paladino, J., Koritsanszky, L., Neal, B. J., Lakin, J. R., Kavanagh, J., Lipsitz, S., Fromme, E. K., Sanders, J., Benjamin, E., Block, S., & Bernacki, R. (2020).	Clustered RCT-CINAHL. The study aimed to determine the effect of the serious illness care program on healthcare utilization at the end of life in patients with advanced cancer who died within two years. Variables: End-of-life care, healthcare utilization, serious illness communication.	Population: Patients with advanced cancer who died within two years of enrollment at the Dana-Farber Cancer Institute. Setting: Cancer institute. (n= 159)	Clinicians in the intervention group received training, coaching, and system support to discuss with patients using a serious illness conversation guide (SICG); clinicians in the control group followed the usual care of no SICG.	SAS software, version 9.4. T-tests and chi-square tests. The National Quality (NQF)-endorsed EoL care indicators.	Results: SICG intervention did not demonstrate a change in health care utilization at the EOL due to limitations; power analysis was only sufficient to detect a considerable effect size in receipt of any aggressive care. Recommendations: Future research efforts should focus on more sensitive and patient-informed measurements of healthcare utilization and study how communication about patients' prognosis, values, and goals leads to care that aligns with	Strength: Inconclusive Limitation: Electronic medical record chart abstraction may underestimate utilization because it only captures care within Partners' Health Care facilities and homogenous patient populations and may not be generalizable to another setting.	II

						what matters most to patients.		
8	Sanders, J. J., Durieux, B. N., Cannady, K., Johnson, K. S., Ford, D. W., Block, S. D., Paladino, J., & Sterba, K. R. (2022).	Qualitative Pilot Study- MEDLINE. The study aimed to assess the acceptability of structured serious illness conversation guide (SICG) among patients with serious illness and their clinicians. Variables: SIC, SICG, communication, Patient-centered care, advance care planning	Population: **Community**-based patients and Black patients with advanced cancer. Setting: Community-based and Oncology institution (n= 20) community-based patients (n= 23) Black advanced cancer patients	Using serious illness conversation guide (SICG) to improve advanced care planning (ACP) in patient with serious illness.	REDCap, Pre-and-post survey	Results: Patients appreciated the conversation framing as this help build connection between patients and clinicians, promote patient autonomy of care, and allowed clinicians to evaluate and gain useful information about patients' understanding, fears, and worries. Recommendation: Future studies should consider larger-scale participants to test the effects of the SICG conversation on patient and family-centered outcomes in diverse patients and clinicians.	Strength: A two-phase study comparing the effect of SICG in two different setting. Limitation: Small number of participants limited the generalizability of the patient's perspective.	III

9	Sekar, D. R., Siropaides, C. H., Smith, L. N., & Nguyen, O. K. (2021).	Case-control study-MEDLINE. The study aimed to engage residents in formal instruction that leads to the goals of care discussions. Variables: Communication skills, end-of-life care, graduate medical education, serious illness, residents, GoC discussion.	Population: Internal medicine residents with serious illnesses. Setting: Academic institute. (n=109)	Using Communication curriculum skills to improve IM residents' confidence and attitudes in initiating goals of care discussion. Goals of care communication skills: NURSE-name emotions, understand and legitimize the emotion, respect, support, explore the emotion further; REMAP-reframe, emotion, map, align, propose a plan; SPIKES-setting, perception, invitation, knowledge, empathy, summary.	T-tests in STATA 12.0. Pre-and-post intervention surveys. 5-point Likert scale.	Result: The GoC communication curriculum improved resident confidence in the EoL discussion. Recommendations: Future studies should consider measuring the clinical outcomes and changes in learner behavior resulting from the GoL communication curriculum. Ongoing observation and feedback on communication skills will be essential to solidify learning and sustain impact.	Strength: The curriculum effectively addresses interpersonal and communication skills (REMAP, SPIKES, & NURSE). Limitation: A single-site study and primary outcomes were residents' confidence and attitudes immediately following the teaching sessions. Thus, the generalizability and impact of the curriculum on longer-term resident knowledge and competence are unknown.	II

10	Shepperd, S., Gonçalves-Bradley, D. C., Straus, S. E., & Wee, B. (2021).	Systematic review-MEDLINE. The systematic review aimed to determine if providing home-based end-of-life care reduces dying in hospitals and the effect on patients' symptoms, quality of life, and the impact on health service costs, health providers, and caregivers. Variables: Home-based, end-of-life care, life expectancy, and terminal illnesses.	Study 1-Patients with a life expectancy of ≤ 12 months mean average age of 71. Setting: Two health organizations. (n=298) Study 2-Patients with terminal illness > 80% of the patients are diagnosed with cancer. Setting: private residence (n=229) Study 3-Patients with a	Identifying preferences of patients with a terminal illness in supporting home-based PC: Study 1- The intervention group received in-home PC continuously from the multidisciplinary team. In contrast, the control care followed Medicare guidelines. Study 2- The intervention group received PC from the IDT palliative team and standard care from a hospital or hospice. The control group received care	Study 1: Reid-Gundlach Social Service Satisfaction Scale. Palliative Performance Scale. Study 2: Texas Revised Inventory of Grief (TRIG), SPSS software Windows 10.1, t-test, Mann-Whitney U test. Study 3: Multivariate analyses of covariance, t-test. Study 4: t-	Results: Most patients would prefer to receive end-of-life care at home. Study 1: in-home palliative care reported more significant improvement in satisfaction with care at 30 and 90 days after enrollment; patients were less likely to visit the emergency department. Study 2: Reported that EoL care affects bereavement outcomes, death at home is associated with better early bereavement response and better physical health six months post-bereavement. Study 3: Findings indicate that the comprehensive and continuous home care services provided in the HBHC model increase access to home care services for terminally ill patients	Strengths: Four RCTs evaluating the effectiveness of home-based end-of-life care with inpatient hospital or hospice care. Articles searched from palliative care journals, CENTRAL, Ovid MEDLINE(R), Embase, CINAHL, and clinical trials. Limitations: The review was completed in 2021 on articles between 1992-2007. Study 1- Patients and clinicians were aware of the intervention. Study 2: Most patients failed to receive the allocated intervention because of the unpredictable nature of the terminal illness.	I

			terminal illness cancer diagnosis had an estimated life expectancy of < 6 months. Setting: residence within Hospital-Based Home Care (HBHC) programs (n=168) Study 4- Patients with incurable malignant disease, life expectancy 2–9 months. Setting: Palliative Medicine	from a hospital or hospice. Study 3- The intervention group received HBHC PC from physician-led IDT. The control group received inpatient hospital care. Study 4- The intervention group received care from the Palliative Medicine Unit, and the community nursing office joined visits at home. The control group received conventional care shared among the hospital departments and the community.	test	and increase patient and caregiver satisfaction with care. Study 4: The PC interventions enabled more patients to die at home and increased focus on using nursing homes and time at home and reducing hospital admissions. Recommendations: Further studies should consider the adequacy of in-home PC and bereavement outcomes—future research on the cost-effectiveness of HBHC for other terminally ill populations such as AIDS patients. Future research must also identify the relationship between home care, caregiver burden, and bereavement.	Study 3: The sample size at six months needed to be increased to approximately test the regression model. Study 4: Blinding was not possible in the trial; performance and detection bias as unclear.	

			Unit (n= 434)					
11	Sinn, C.-L. J., Heckman, G., Poss, J. W., Onder, G., Vetrano, D. L., & Hirdes, J. (2020).	Retrospective cohort study-MEDLINE The study aimed to determine the most effective frailty measures for home care patients with serious illnesses to support referral and care planning decisions. Variables: Frail elderly, home care patients, serious illness, CHESS scale Population: Frail patients with serious illnesses.	Population: Frail patients with serious illnesses Setting: Private residence Patients aged < 65 (n = 64,543) Patients aged ≥ 65 (n = 164,136) (n= 228 679)	Using assessment tools: Changes in Health, End-stage disease, and Signs and Symptoms Scale for the Contact Assessment (CHESS-CA), Assessment Urgency Algorithm (AUA), and Frailty Index for the Contact Assessment (FI-CA) to measure frailty in home care patients indicating death within 90 days and hospitalization.	SAS software version 9.4. Spearman rank order correlations	Result: Among all frailty measuring tools, the CHESS scale was best suited for predicting death and hospital admission for home care patients with serious illnesses. Recommendation: Future research should consider generalizability; by including COVID-19 disease among the population sample size.	Strength: Large population size, use of multiple care planning toolkits Limitations: Some questions, such as changes in cognition or activities of daily living status in the last 90 days, are prone to self-report and recall biases. Deaths were identified from the discharge disposition found in home care and hospital administrative records. If the patient moved to another setting (e.g., a long-term care facility) and died within 90 days, the discharge disposition would not be revised retroactively,	II

							resulting in underreporting actual deaths.	
12	Stall, N., Nowaczynski, M., & Sinha, S. K. (2014).	Systematic review-Psychology and Behavioral Sciences Collection. A systematic review of nine studies hypothesized that HBPC programs for homebound older adults ≥65 reduce hospitalizations and long-term care admissions while improving patient and caregiver quality of life and satisfaction with care. Variables: Home-based primary care, house calls, homebound older adults.	Population: Homebound community-dwelling older adults ≥65. Setting: Home-based Community. (N=46,154)	Providing in-home interprofessional care teams with follow-up visits after initial home-based primary care intake assessment, regular interprofessional care meetings, and after-hours support to decrease emergency department visits, hospitalizations, hospital beds days of care, long-term care admissions, or long-term care bed days of care.	5-point Likert scale and Barthel index	Results: Decrease ED visits, hospitalization, inpatient hospital stays, long-term care admission, hospital cost, and caregiver burden. Increase patients' satisfaction, vaccination administration, advance directive documentation, QoL, and EoL wishes of dying at home. Recommendation: Further studies should be conducted considering developing a consensus definition for homebound, standardized selection criteria, and validated screening tools for this population.	Strengths: Studies were extracted from Cochrane, PubMed, and MEDLINE databases. Most of the studies had a large population size. Limitations: Study quality limited the review (one RCT and eight observational studies). There was unmeasured heterogeneity among review subjects for characteristics such as comorbidity, frailty, cognition, and function. Inferences about model components associated with the effectiveness of home-based primary care programs as the	I

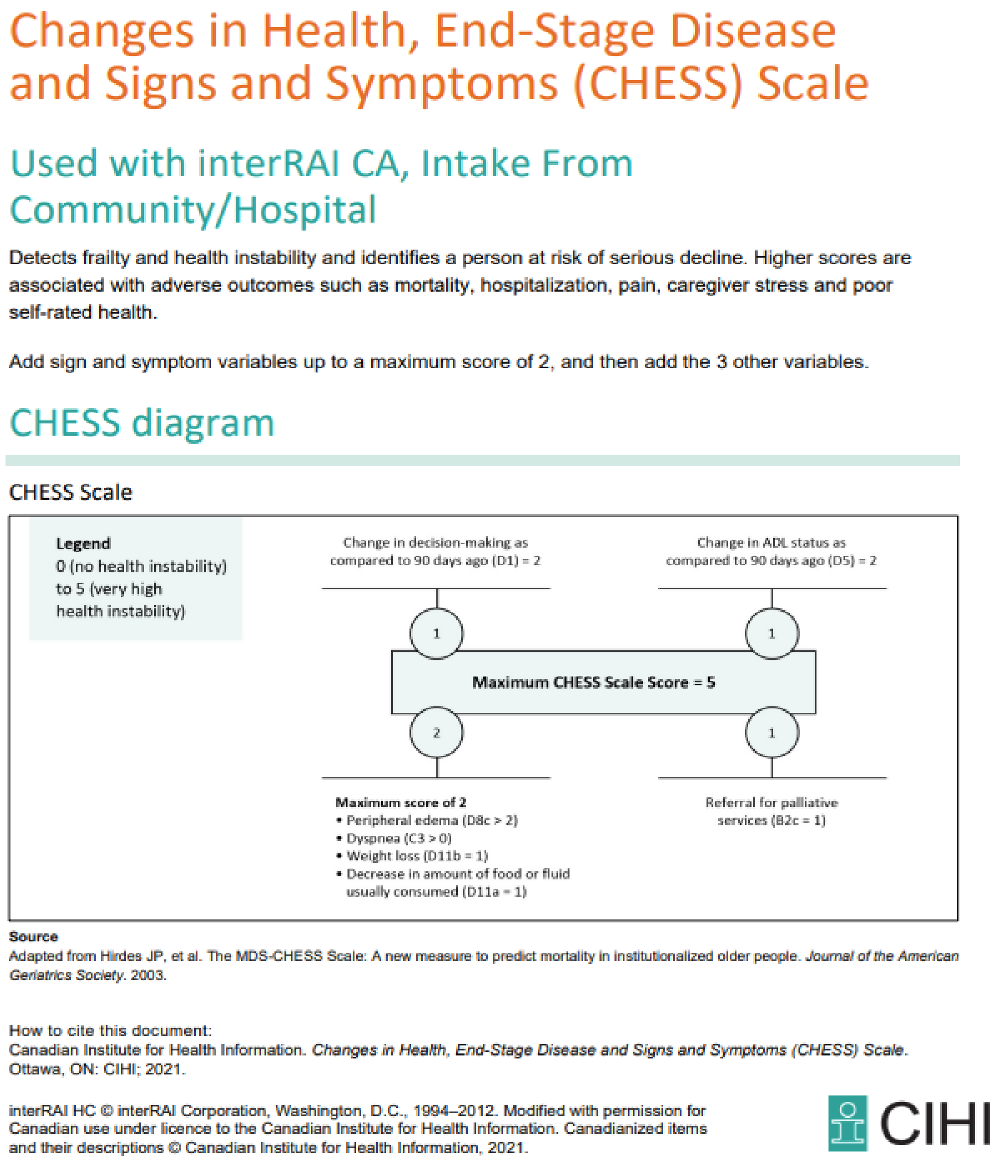
							authors of included studies were invited to verify the review’s interpretations.	
13	Williams, N., Hermans, K., Cohen, J., Declercq, A., Jakda, A., Downar, J., Guthrie, D. M., & Hirdes, J. P. (2022),	Retrospective cohort Study-CINAHL. The study aimed to determine if the CHESS scale compared to the PPS scale, is a good predictor of 90-day mortality in a PC population. Variables: Palliative care population, CHESS & PPS scales, and mortality.	Population: Palliative care population aged ≥18. Setting: Variety of health care settings (e.g., home care, long-term care, hospital, hospice). (n= 80,261)	Clinicians used predictor tools (CHESS & PPS) in serious illness patients to predict mortality, identify person-specific PC preferences, symptoms, and needs to support clinicians in the care planning process, and determine hospice eligibility.	SAS, version 9.4. STRengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines.	Results: The CHESS Scale performed slightly better than the PPS in predicting 90-day mortality. With each increasing score on the CHESS Scale, the odds of dying within 90 days also increased. Recommendation: Future research should focus on developing palliative-specific variants of the CHESS Scale that employ more items from the interRAI PC into a single composite measure of mortality risk and clinical complexity.	Strengths: A large sample size representing most regions, the CHESS scale is widely used internationally. Trained care coordinators completed assessments. Limitation: The data were limited to individuals receiving PC in a single province in the country.	II

Note. This table represents thirteen articles identifying the gap in healthcare relating to serious illness discussions, and utilization of evidenced based practice measures to improve patients’ serious illness discussions (goals-of-care and end-of-life) and decision-making wishes and values.

Appendix C

Figure C1

Changes in Health, End-Stage Disease, Signs and Symptoms (CHESS) Scale Handout



Changes in Health, End-Stage Disease and Signs and Symptoms (CHESS) Scale

Used with interRAI CA, Intake From Community/Hospital

Detects frailty and health instability and identifies a person at risk of serious decline. Higher scores are associated with adverse outcomes such as mortality, hospitalization, pain, caregiver stress and poor self-rated health.

Add sign and symptom variables up to a maximum score of 2, and then add the 3 other variables.

CHESS diagram

CHESS Scale

Legend
0 (no health instability)
to 5 (very high
health instability)

Change in decision-making as compared to 90 days ago (D1) = 2

1

Change in ADL status as compared to 90 days ago (D5) = 2

1

Maximum CHESS Scale Score = 5

2

Maximum score of 2
- Peripheral edema (D8c > 2)
- Dyspnea (C3 > 0)
- Weight loss (D11b = 1)
- Decrease in amount of food or fluid usually consumed (D11a = 1)

1

Referral for palliative services (B2c = 1)

Source
Adapted from Hirdes JP, et al. The MDS-CHESS Scale: A new measure to predict mortality in institutionalized older people. *Journal of the American Geriatrics Society*. 2003.

How to cite this document:
Canadian Institute for Health Information. *Changes in Health, End-Stage Disease and Signs and Symptoms (CHESS) Scale*. Ottawa, ON: CIHI; 2021.

CIHI

Providers will be using the below checklist to ask questions during visit

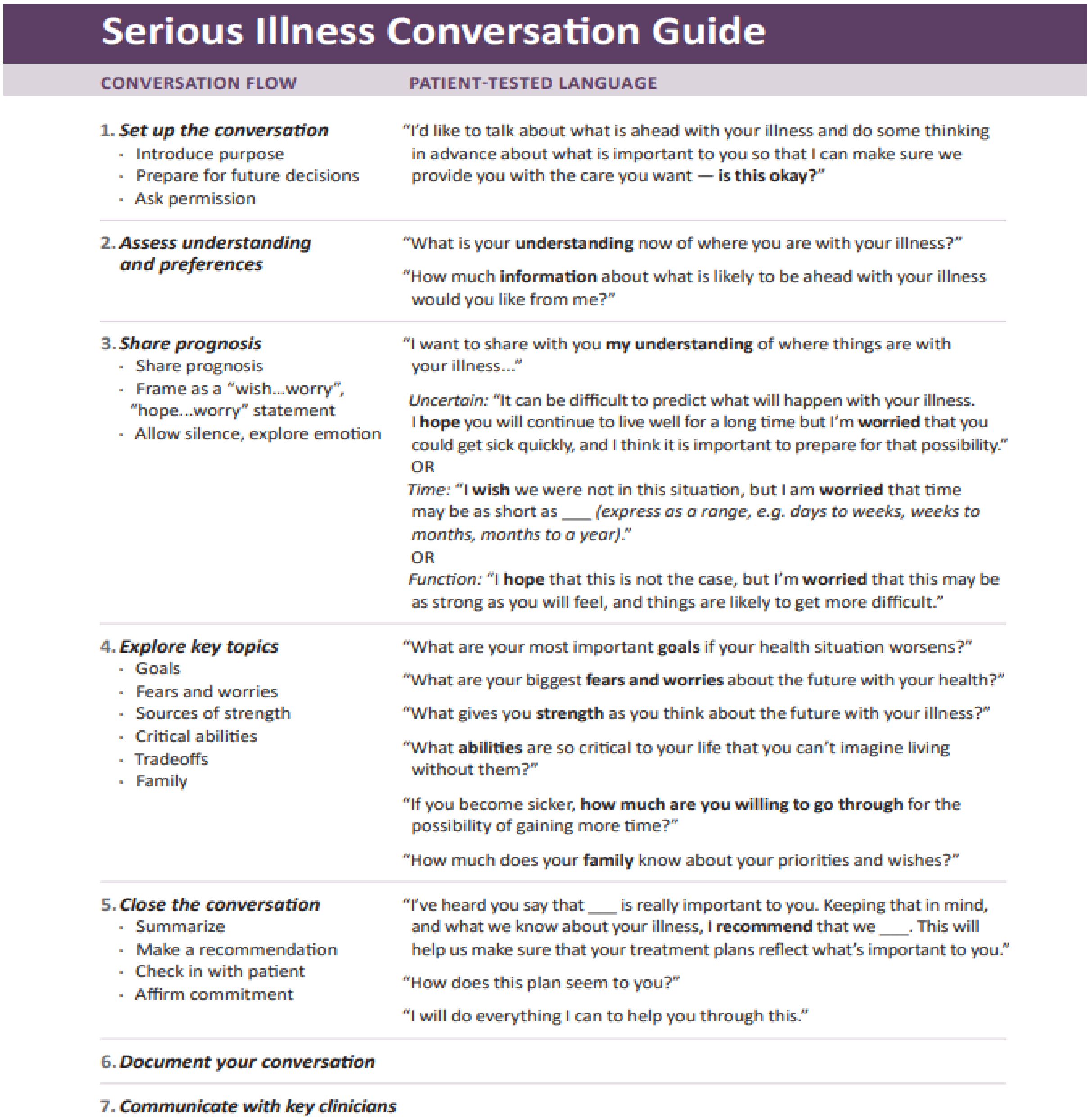
Checklist for CHESS scale ***(statements or questions)***		
Content and Format	**0**	**1**
1. Is there a change is decision making as compared to 90 days ago?		
2. Is there a change in ADL status as compared to 90 days ago?		
3. Was there a referral to initiate or continue palliative services?		
4. Does the patient have any of these signs and symptoms: dyspnea, weight loss, vomiting, peripheral edema, noticeable decrease in the amount of food usually eaten or fluids consumed, and albumin <2.5. Note: If only 1 sign or symptom is present, add 1 point. If 2 or more are present, add 2 points.		
Total CHESS score		

There are 5 steps in the process to determine a CHESS scale score:
First, if there is a Change in Decision Making as Compared to 90 Days Ago, add 1 point.
Second, if there is a Change in ADL (activity of daily living) Status as Compared to 90 Days Ago, add 1 point.
Third, if there was a Referral to initiate or continue palliative services, add 1 point.
Fourth, consider the following signs and symptoms: Dyspnea, Peripheral edema, Vomiting, Noticeable decrease in the amount of food usually eaten or fluids consumed, and Weight loss. If only 1 sign or symptom is present, add 1 point. If 2 or more are present, add 2 points. Finally, add all the points together for a maximum CHESS scale score of 5.
Scores range from 0 to 5, defined as follows:
0 = No health instability; 1 = Minimal health instability; 2 = Low health instability; 3 = Moderate health instability; 4 = High health instability; and 5 = Very high health instability.

Note. The CHESS scale will be used to monitor patient serious illness prognosis.

Figure C2

Serious Illness Conversation Guide Handout



Serious Illness Conversation Guide

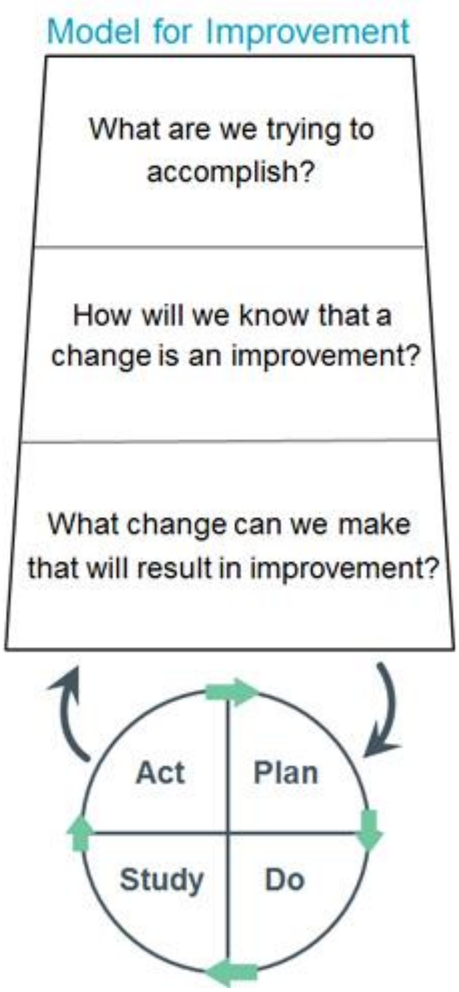
CONVERSATION FLOW	PATIENT-TESTED LANGUAGE
1. ***Set up the conversation*** · Introduce purpose · Prepare for future decisions · Ask permission	"I'd like to talk about what is ahead with your illness and do some thinking in advance about what is important to you so that I can make sure we provide you with the care you want — **is this okay?**"
2. ***Assess understanding and preferences***	"What is your **understanding** now of where you are with your illness?" "How much **information** about what is likely to be ahead with your illness would you like from me?"
3. ***Share prognosis*** · Share prognosis · Frame as a "wish...worry", "hope...worry" statement · Allow silence, explore emotion	"I want to share with you **my understanding** of where things are with your illness..." *Uncertain:* "It can be difficult to predict what will happen with your illness. I **hope** you will continue to live well for a long time but I'm **worried** that you could get sick quickly, and I think it is important to prepare for that possibility." OR *Time:* "I **wish** we were not in this situation, but I am **worried** that time may be as short as ___ *(express as a range, e.g. days to weeks, weeks to months, months to a year)*." OR *Function:* "I **hope** that this is not the case, but I'm **worried** that this may be as strong as you will feel, and things are likely to get more difficult."
4. ***Explore key topics*** · Goals · Fears and worries · Sources of strength · Critical abilities · Tradeoffs · Family	"What are your most important **goals** if your health situation worsens?" "What are your biggest **fears and worries** about the future with your health?" "What gives you **strength** as you think about the future with your illness?" "What **abilities** are so critical to your life that you can't imagine living without them?" "If you become sicker, **how much are you willing to go through** for the possibility of gaining more time?" "How much does your **family** know about your priorities and wishes?"
5. ***Close the conversation*** · Summarize · Make a recommendation · Check in with patient · Affirm commitment	"I've heard you say that ___ is really important to you. Keeping that in mind, and what we know about your illness, I **recommend** that we ___. This will help us make sure that your treatment plans reflect what's important to you." "How does this plan seem to you?" "I will do everything I can to help you through this."
6. ***Document your conversation***	
7. ***Communicate with key clinicians***	

Note. A serious illness conversation guide shows an organized conversation flow and use of appropriate patient language.

Appendix D

Figure 1

Model for Improvement Framework

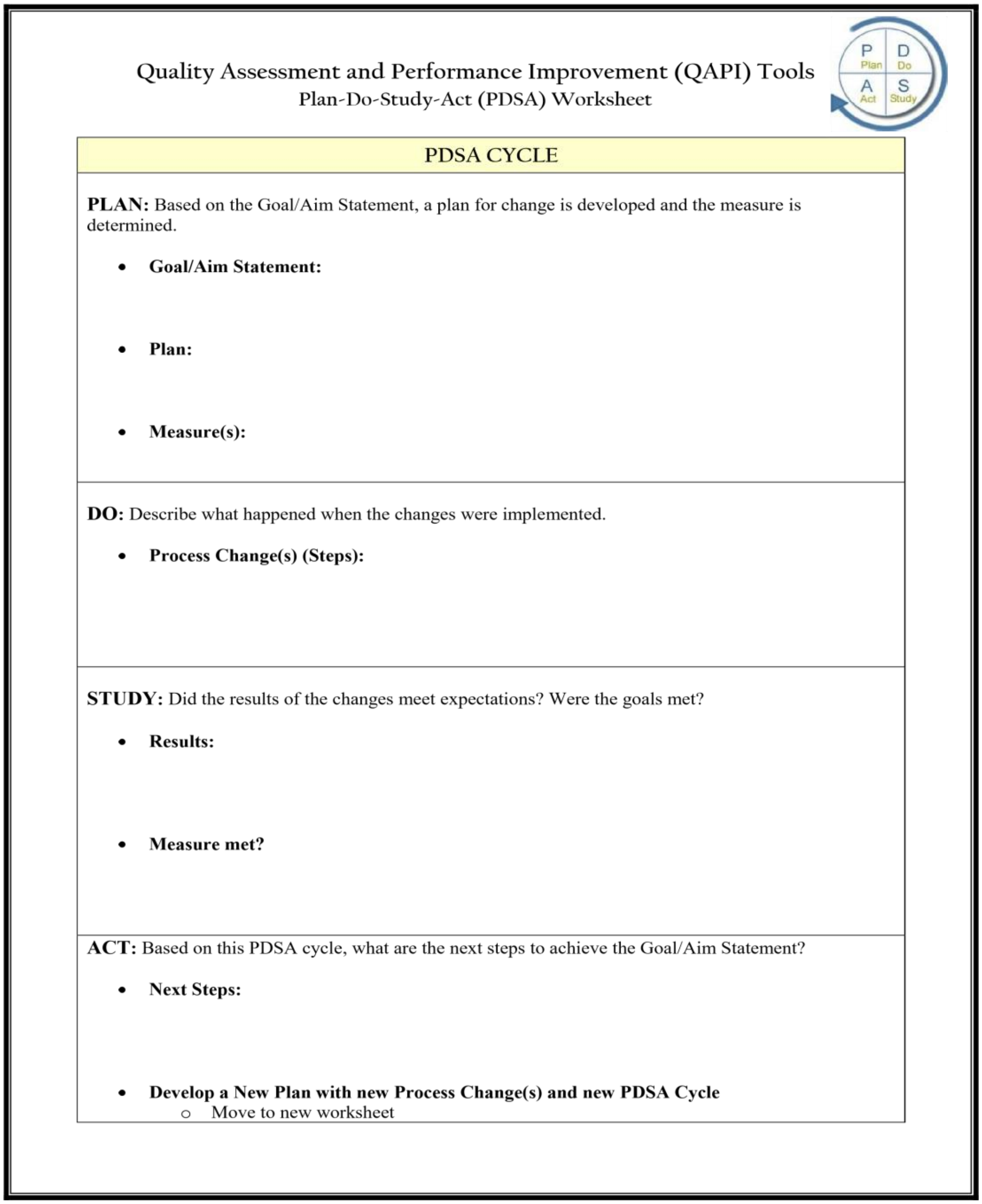


Note. The Model for Improvement framework shows the flow of process and it is used as a primary approach to improve existing practice.

Appendix E

Figure 1

Plan-Do-Study-Act (PDSA) Worksheet Form



Quality Assessment and Performance Improvement (QAPI) Tools

Plan-Do-Study-Act (PDSA) Worksheet

PDSA CYCLE

PLAN: Based on the Goal/Aim Statement, a plan for change is developed and the measure is determined.

- **Goal/Aim Statement:**
- **Plan:**
- **Measure(s):**

DO: Describe what happened when the changes were implemented.

- **Process Change(s) (Steps):**

STUDY: Did the results of the changes meet expectations? Were the goals met?

- **Results:**
- **Measure met?**

ACT: Based on this PDSA cycle, what are the next steps to achieve the Goal/Aim Statement?

- **Next Steps:**
- **Develop a New Plan with new Process Change(s) and new PDSA Cycle**
    - Move to new worksheet

Note. A PDSA worksheet form is used to track the steps of the PDSA process, keep records, and document the progress of change, that the organization can use as a reference.

Appendix F

Figure F1

Training and Educational session

OBJECTIVES	**CONTENT (Topics)**	**TEACHING METHODS**	**TIMEFRAME**	**EVALUATION METHOD**
After attending the training and educational session, clinicians will be able to: 1) Describe identify the appropriate time to initiate serious illness discussion. 2) Be confident and independent in initiating serious illness discussions. 3) Apply skills and knowledge acquired to practice using CHESS scale and serious illness conversation guide.	1) Introduction of the Gap in practice relating to serious illness discussions. 2) Review general knowledge, correct errors, and reinforce appropriate measures. 3) Present examples/case studies/scenarios and role play using CHESS scale and serious illness conversation guide.	Power point presentation, simulation, role play, discussion, related short videos, and brochure.	1) 10 minutes 2) 15 minutes 3) 35 minutes	Teach back, observation, anecdotal notes, peer review

Note. A weekly training and educational session on serious illness discussions using the CHESS scale and serious illness conversation guide.

Figure F2

PowerPoint Presentations and Videos

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals

What is serious illness?

Initiating the serious illness discussions

When to initiate serious illness discussions

The CHESS scale

Provider Communication Guide

Serious Illness Conversation Guide

Project Objectives

References

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals

Presented by: Joy Isebor, FNP-BC
Feb 6, 2024

Aprima Documentation

Aprima DX = Z71.89 for Advance care planning
Aprima SP = Advance care plan
Counseling 16-45 mins or > 45 mins
Aprima SO = Hospice / Palliative care referral order

The CHESS scale Prognosticator Tool

Changes in Health, End-Stage Disease and Signs and Symptoms (CHESS) Scale

CHESS diagram

Aprima Plan

ACP Macro

A voluntary F2F visit between provider and patient, family member, caregiver, or surrogate to discuss patient's health care wishes, goals of care, and end of life conversations. ACP reviewed with patient/ family-patient wishes to remain full code at this time-advised to notify provider for any future changes to code status. Patient/ family agreed. Part of the discussions include advance directives: health proxy, medical order for life-sustaining treatment, and durable power of attorney for health care and review of patient's current health conditions ____. Educated on Living Will and DPOA including purpose and importance of having in place. Educated on the difference between full, DNRCC, DNRCCA. All questions answered. States understanding.

A ____ minutes encounter.

Providers CHESS scale checklist

Checklist for CHESS scale [illegible]		
Concerns and Factors	0	1
1. [illegible]		
2. [illegible]		
3. [illegible]		
4. [illegible]		
Total CHESS score		

Videos

https://www.youtube.com/watch?v=fhwa9fSO_U4&list=PLV6hgMBUrjT26M2auE8AE9429HdFheQL5&index=8

https://www.youtube.com/watch?v=qFt4cu6jhi8&t=32s

Serious Illness Conversation Guide

References

Ariadne Labs. (2015). *Serious illness conversation guide* [Brochure]. https://www.ariadnelabs.org/wp-content/uploads/2017/05/SI-CG-2017-04-21_FINAL.pdf

Ariadne Labs. (2016, April 13). *Serious illness conversation guide demonstration.* [Video]. Youtube. https://www.youtube.com/watch?v=fhwa9fSO_U4&list=PLV6hgMBUrjT26M2auE8AE9429HdFheQL5&index=8

Job Aid. (2021). *Changes in health, end-stage disease, signs and symptoms (CHESS) scale* [Brochure]. https://www.cihi.ca/sites/default/files/document/interrai-ca-chess-job-aid-en-web.pdf

Mayaert, P. (2023, April 15). *How to recognize a dying patient? Signs of approaching death.* [Video]. Youtube. https://www.youtube.com/watch?v=qFt4cu6jhi8&t=32s

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions
and
Improving the Rate of Palliative and Hospice Referrals

Presented by: Joy Isebor, FNP-BC
Feb 13, 2024

Video

Discussing Prognosis

Question

1. Regarding developing skills for effective conversations about end-of-life wishes with patients and families, which of the following statements is true?

a) If you have strong technical skills, conversational skills should come easily to you.

b) Conversational skills are acquired naturally, and not something that depends on training.

c) Like other professional skills, developing exceptional conversational skills is a matter of both good training and lots of practice.

d) All of the above

Discussing Prognosis Cont.

References

Boston University. (2012, February 1). *Teaching doctors how to close life's last door* [video]. Youtube. https://www.youtube.com/watch?v=0uChdyvk7LA

Center to Advance Palliative Care. (2019, October 29). *Discussing prognosis*. https://www.capc.org/training/communication-skills/discussing-prognosis/

Vitaltalk. (2019). *Discussing prognosis* [Brochure]. https://www.vitaltalk.org/guides/discussing-prognosis/

Just as no doctor is born knowing how to handle a scalpel, the same is true for how to communicate effectively with seriously ill patients and their families.

-Vitaltalk.org

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions
and
Improving the Rate of Palliative and Hospice Referrals

Presented by: Joy Isebor, FNP-BC
Mar 12, 2024

Clarifying Goals

Clarifying Goals Cont.

Question

An 85-year-old woman dies at a skilled nursing facility after several years of living with cancer. She had hoped to die at home, and felt ready and accepting, but her children (whom she didn't want to trouble) and her clinicians were dedicated to extending her life as long as possible. Did the woman die in a way that respected her wishes?

1. Yes, because the woman had family who loved her.
2. No, because the woman's children only cared about themselves.
3. Yes, because the woman fought until the end.
4. No, because the woman did not have a chance to express her end-of-life wishes.

Debbie Palliative Care Story

https://www.youtube.com/watch?v=8HZM0pL3a8E

After 10 years:

https://www.youtube.com/watch?v=eUxC9wfDa3o

Reference

Center to Advance Palliative Care. (2019, December 6). *Clarifying goals of care.* https://www.capc.org/training/communication-skills/clarifying-goals-of-care/

Note. PowerPoint presentations slides and videos on implementation of prognosticator algorithm.

Figure F3

Provider's Communication Brochure

Phases to avoid

"There is nothing more we can do for you."
"I know what this must be like"
"Would you like us to do everything possible?"
"It is futile."
"Stop the vigorous treatment, is not helpful."

Respond to patient emotion

"I wish"
Aligning with the patient while acknowledging that bad things can happen.

"I wish things are different"
"I wish I had better news"

N.U.R.S.E

Naming the emotions/ problem/ illness
Understand and legitimize where they are coming from and their emotions
Respect, show it verbally/ non-verbally
Support by giving them credence and express your concern
Explore, tell me more about…dwell more in depth on their concern

"Words Matter"

Provider's Communication Guide

ASK-TELL-ASK

Ask
What do you understand about your illness?
What have the doctors told you about your medical condition?

Tell
Deliver information you need to. "It is a serious condition"

Ask
Sometimes I don't communicate well. Can you tell me what you heard?
Is there something more that I can help you understand?
Can we delve deeper knowing the seriousness of your condition?

Explore values and elicit goals

Given the severity of your illness, what is most important to you?
As you think about the future, what are your most important hopes?
What are your biggest fears?
How do you think about balancing quality of life with length of life in terms of your treatment?
What do you consider your quality of life to be like now?
What makes life most worth living for you?

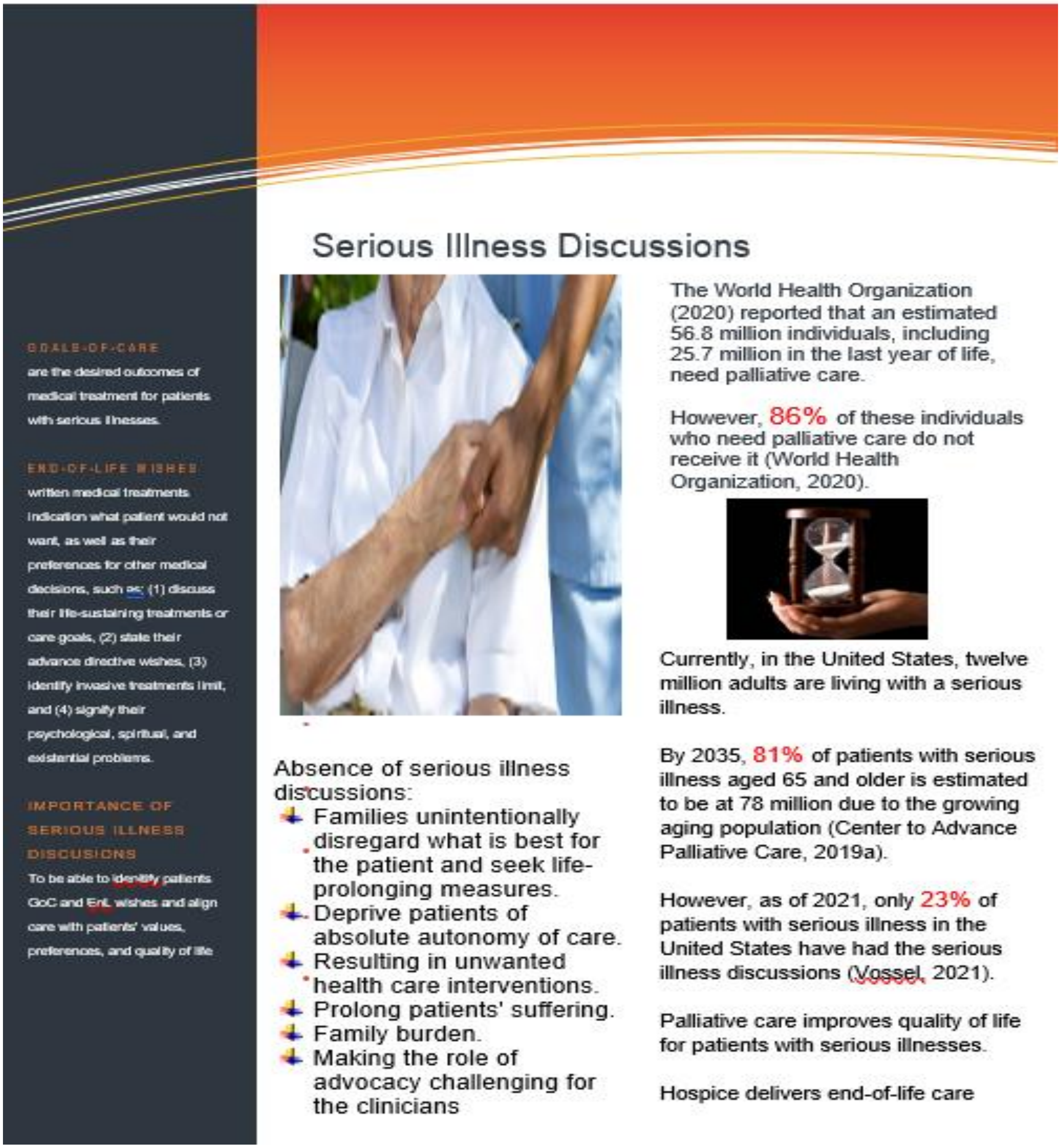
Giving bad news- S.P.I.K.E.S

Set up the interview
Assess the patient's **P**erception
Obtain the patient's **I**nvitation
Give the **K**nowledge to the patient
Address patient **E**motions with empathic responses
Summarize and provide strategy

Note. A provider's communication guide that can be used to help ease the initiation of serious illness discussion.

Figure F4

Serious Illness Discusion Handout



Serious Illness Discussions

GOALS-OF-CARE

are the desired outcomes of medical treatment for patients with serious Ilnesses.

END-OF-LIFE WISHES

written medical treatments. Indication what patient would not want, as well as their preferences for other medical decisions, such as: (1) discuss their life-sustaining treatments or care goals, (2) state their advance directive wishes, (3) identify invasive treatments limit, and (4) signify their psychological, spiritual, and existential problems.

IMPORTANCE OF SERIOUS ILLNESS DISCUSIONS

To be able to identify patients GoC and EnL wishes and align care with patients' values, preferences, and quality of life

Absence of serious illness discussions:

- Families unintentionally disregard what is best for the patient and seek life-prolonging measures.
- Deprive patients of absolute autonomy of care.
- Resulting in unwanted health care interventions.
- Prolong patients' suffering.
- Family burden.
- Making the role of advocacy challenging for the clinicians

The World Health Organization (2020) reported that an estimated 56.8 million individuals, including 25.7 million in the last year of life, need palliative care.

However, 86% of these individuals who need palliative care do not receive it (World Health Organization, 2020).

Currently, in the United States, twelve million adults are living with a serious illness.

By 2035, 81% of patients with serious illness aged 65 and older is estimated to be at 78 million due to the growing aging population (Center to Advance Palliative Care, 2019a).

However, as of 2021, only 23% of patients with serious illness in the United States have had the serious illness discussions (Vossel, 2021).

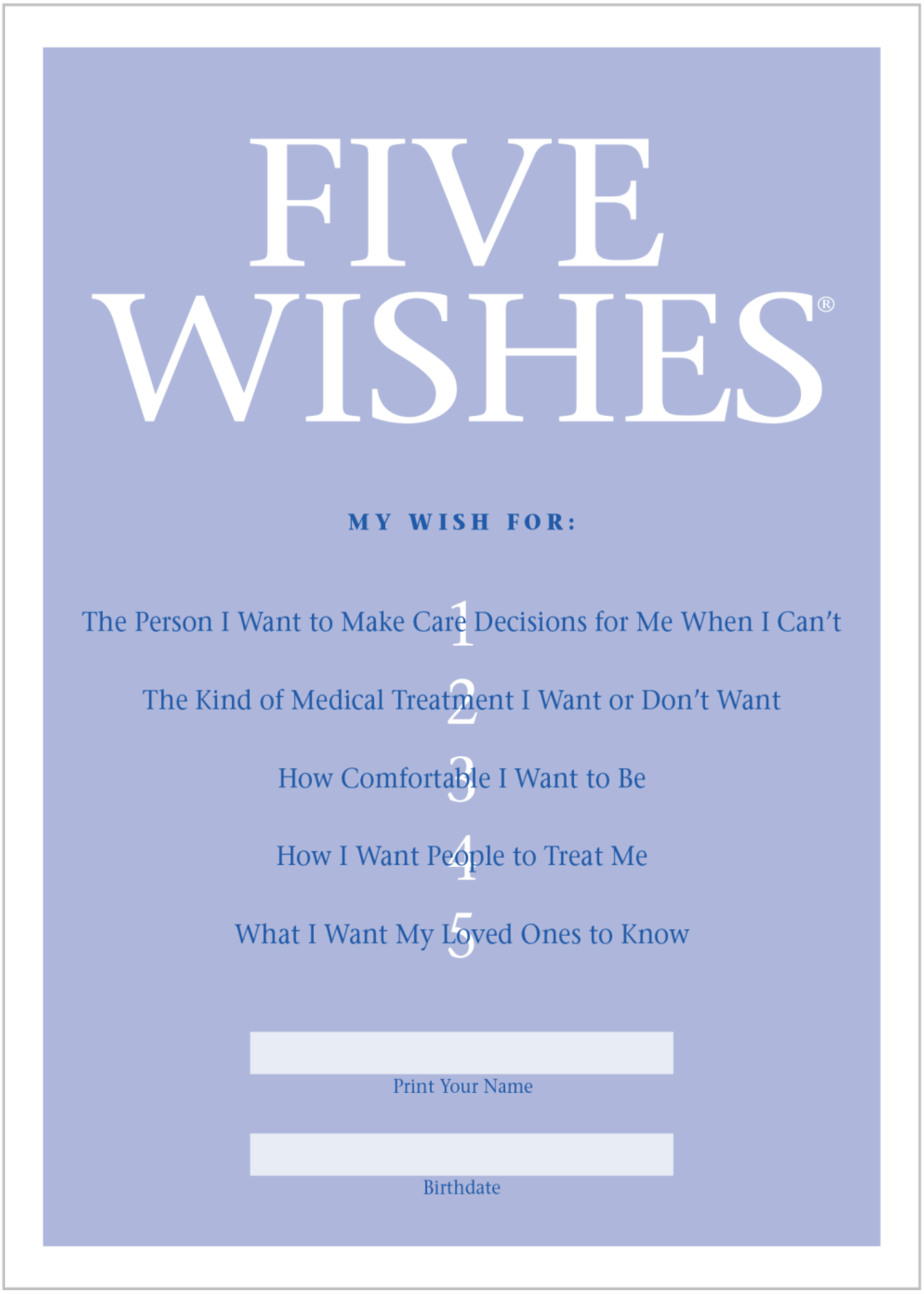
Palliative care improves quality of life for patients with serious illnesses.

Hospice delivers end-of-life care

Note. A serious illness discussion handout

Figure F5

Five Wishes



FIVE WISHES®

MY WISH FOR:

1 The Person I Want to Make Care Decisions for Me When I Can't

2 The Kind of Medical Treatment I Want or Don't Want

3 How Comfortable I Want to Be

4 How I Want People to Treat Me

5 What I Want My Loved Ones to Know

Print Your Name

Birthdate

Note. The five wishes paper is used to help patients with serious illness document how they want to be cared for at the end of life.

Appendix G

Figure 1

Training Feedback Form

Thank you for taking the time to complete this feedback form as your comments are important to us.

Date:_______________Presenter's name:_______________________

Please rate the following:

	(4) Strongly Agree	(3) Agree	(2) Disagree	(1) Strongly Disagree
1. The training offered information that was relevant to my patients/ work.	☐	☐	☐	☐
2. I will be able to apply what I learned from this training to my work life.	☐	☐	☐	☐
3. The style of the presentation was conducive to learning.	☐	☐	☐	☐
4. The presenter seemed knowledgeable about the topic.	☐	☐	☐	☐
5. I would recommend this training to clinicians.	☐	☐	☐	☐

6. What ideas did you find *most useful*?

7. What would you recommend changing about the training?

8. Other comments, observations, suggestions:

Note. A training feedback form, to be used to ascertain that the training sessions are useful and relevant in serious illness discussions.

Appendix H

Figure 1

Weekly Likert scale-based survey questions

1. How helpful was the weekly training and educational session?

○	○	○	○	○
Not at all helpful= 1	Slightly helpful= 2	Moderately helpful= 3	Very helpful= 4	Extremely helpful= 5

2. How helpful was the use of CHESS scale to predict severity of illness?

○	○	○	○	○
Not at all helpful= 1	Slightly helpful= 2	Moderately helpful= 3	Very helpful= 4	Extremely helpful= 5

3. How helpful was the serious illness conversation guide in initiating the serious illness discussion?

○	○	○	○	○
Not at all helpful= 1	Slightly helpful= 2	Moderately helpful= 3	Very helpful= 4	Extremely helpful= 5

4. How helpful was the video and materials provided help with learner communication skills?

○	○	○	○	○
Not at all helpful= 1	Slightly helpful= 2	Moderately helpful= 3	Very helpful= 4	Extremely helpful= 5

5. How helpful was the training/ educational session to improving your knowledge on serious illness trajectory?

○	○	○	○	○
Not at all helpful= 1	Slightly helpful= 2	Moderately helpful= 3	Very helpful= 4	Extremely helpful= 5

Note. A weekly Likert scale-based survey questions, use to measure the effect of providers' training and education.

Appendix I

Table 1

Pre-and-Post Survey Form

Please rate your knowledge of patient deterioration and confidence with the following patient / family interactions, by ticking the relevant box below

1 = Need further basic instruction
2 = Confidence to perform with close supervision / coaching
3 = Confidence to perform independently

No	**Patient/family interactions and clinical management**	**1**	**2**	**3**
1	Determine when to initiate the serious illness discussions			
2	Discussing patients' goals-of-care and end-of-life wishes			
3	Supporting the patient or family member when they become upset			
4	Answering patients' questions about the dying process			
5	Discussing and initiating palliative care referral			
6	Discussing and initiating hospice care referral			

Note. The is the pre-and-post survey that will be used to determine providers' baseline and effect of QI intervention at the end of 8-week.

Appendix J

Table 1

Quality improvement implementation questionnaire

General Recommendations:

- Questionnaires should be completed during each encounter with patients in the target population: aged 65 and older with serious illnesses.
- Yes: 1
- No: 2

Checklist for Evaluating Items *(statements or questions)*		
Content and Format	**Yes✓**	**No✓**
1. Did you have a serious illness discussions with patient today? If Yes, proceed to Q 2/ If No, Proceed to Q 6		
2. Is the family member present during this discussion?		
3. Did this patient stated their goal-of-care and end-of-life wishes?		
4. Is this patient referred to palliative care?		
5. Is this patient referred to hospice services?		
6. Is this patient already under palliative service?		
7. Is this patient already transitioned to hospice care?		

Note. This quality improvement implementation questionnaire will be filled by providers at each patient encounter.

Appendix K

Figure 1

Demographic Collection Form

Please answer the following questions.

1. Patient’s age:

☐ A. 65- 75
☐ B. 76- 85
☐ C. 86+

2. Gender:

☐ A. Male
☐ B. Female

3. Race:

☐ A. White
☐ B. African American
☐ C. Asian
D. ☐ American Indian or Alaska Native
E. ☐ Native Hawaiian or other Pacific Islander
F. ☐ Other

4. Hispanic or Latino?

☐ A. Yes
B. ☐No

5. What is your primary language?

☐ A. English
☐ B. Spanish
C. ☐ Mandarin
D. ☐ Other

6. What is your highest degree?

☐ a. High school diploma
☐ b. Certificate
☐ c. Associates degree
D. ☐ Bachelor’s degree
E. ☐ Master’s degree
F. ☐ Other

7. List of serious illnesses:

☐ A. Chronic respiratory disease
☐ B. Heart disease
☐ C. Kidney disease
D. ☐ Liver disease
E. ☐ Cancer
F. ☐ Other

Note. Each patient that participates in the pilot study will fill this demographic sheet

Appendix L

Table 1

Database/ Dashboard of Data for Collection

Q1 Patient code	**Q 2** Yes= 1 No= 2	**Q 3** Yes= 1 No= 2	**Q 4** Yes= 1 No= 2	**Q 5** need further basic instruction=1, confidence to perform with close supervision and coaching=2, confidence to perform independently= 3	**Q 6** Chronic respiratory disease= 1, heart disease= 2, kidney disease= 3, liver disease= 4, cancer= 5, other= 6	**Q 7** White= 1, African American= 2, Asian= 3, American Indian or Alaska Native= 4, Native Hawaiian or other Pacific Islander = 5, Other= 6,	**Q 8** not at all helpful= 1, slightly helpful= 2, moderately helpful= 3, very helpful= 4, extremely helpful= 5.
Patient A-1	1	1	2		2, 3	2	

The dashboard coding is designed with eight columns:
(1) patient code with be alphanumerical- patient A,B,C, and clinician 1,2,3
(2) yes or no to initiating the serious illness discussions with yes = 1 and no = 2,
(3) yes or no to palliative care referral with yes = 1 and no = 2,
(4) yes or no to hospice referral with yes = 1 and no = 2,
(5) the pre-and-post survey:1= need further basic instruction, 2= confidence to perform with close supervision and coaching, and 3= confidence to perform independently,
(6) serious illnesses: chronic respiratory disease= 1, heart disease= 2, kidney disease= 3, liver disease= 4, cancer= 5, other= 6,
(7) race: White= 1, African American= 2, Asian= 3, American Indian or Alaska Native= 4, Native Hawaiian or other Pacific Islander = 5, Other= 6
(8) Likert scale-based survey questions: not at all helpful= 1, slightly helpful= 2, moderately helpful= 3, very helpful= 4, extremely helpful= 5

Note. Database/ dashboard of data collection.

Appendix M

Figure 1

The Human Subject Protection Training Certificate

10/21/23, 8:21 AM Mentis

UNIVERSITY OF TEXAS ARLINGTON

Human Subjects Protection Training (HSP): Training Completion Certificate

This document certifies that Joy Enesude Isebor completed the training entitled “Human Subjects Protection Training (HSP)” on October 21st, 2023.

Training Start time: 10/21/2023 06:08 AM; Training End Time: 10/21/2023 08:20 AM

The Office of Regulatory Services
817-272-3723

regulatoryservices@uta.edu

Note. Certificate of completion attained for completing the human subject protection training.

Appendix N

Table 1

SWOT Analysis Table

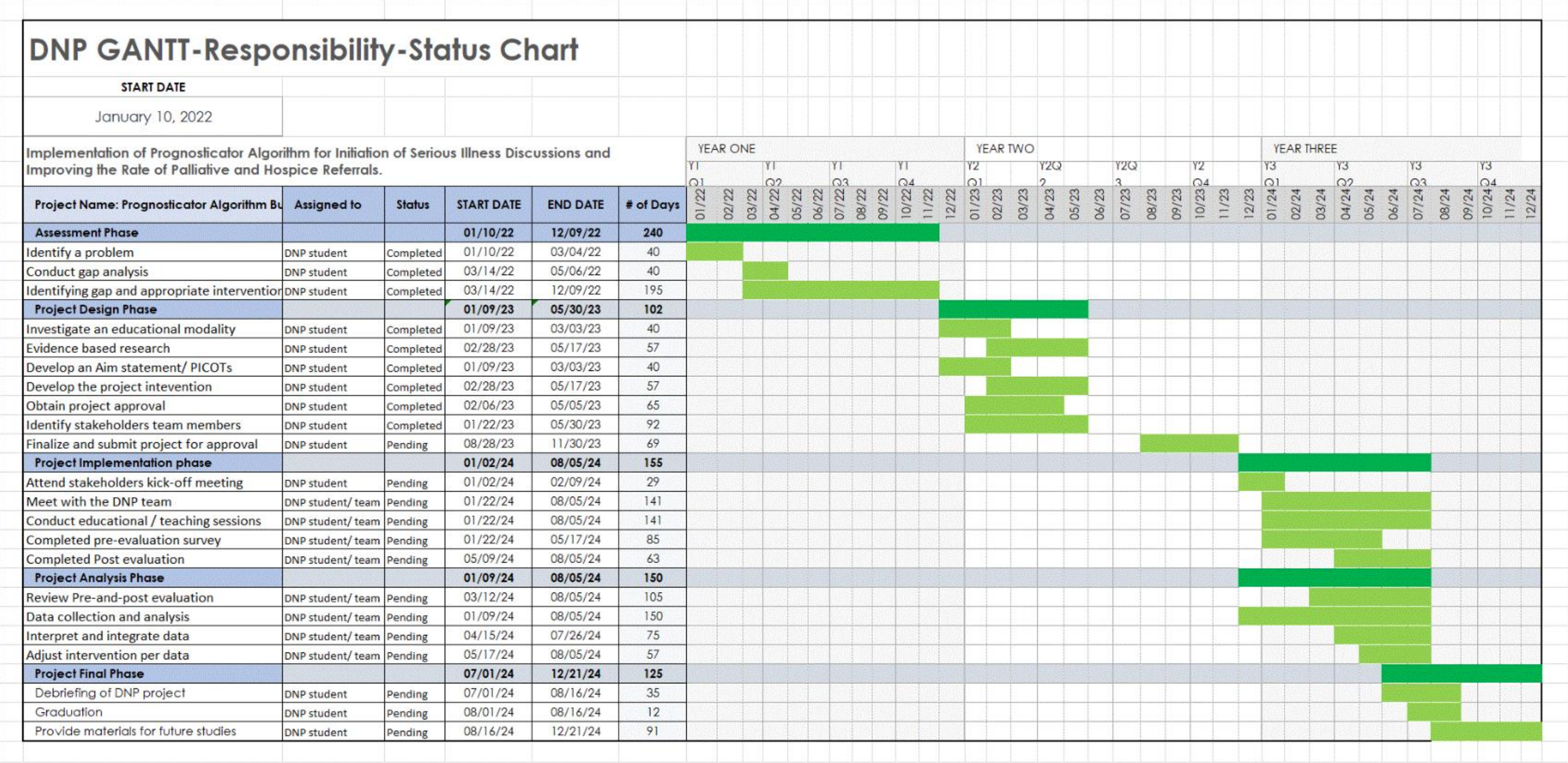
Strengths	Weaknesses
1. Promoting a transdisciplinary team in an organization 2. The capability of performing necessary EoL and GoC interventions promptly 3. Identifying staff strengths and skills 4. Promoting rate of referrals 5. Promote unity and interpersonal interactions in the workplace	1. Sensitive topic to initiate 2. Provider/patient's religion and beliefs 3. Lack of effective communication among team members 4. Absence of the maximum usage of staff's skills and knowledge
Opportunities	Threats
1. Increasing the number of patients that complete their advance care planning 2. Decrease the rate of ER visit and in-patient admission 3. Development of interdisciplinary collaborations 4. Improve patient's quality of life 5. Increase awareness and acceptance of serious illness discussion	1. Decreased patients' satisfaction for patient that are not ready for the discussions 2. Decrease productivity and poor communication among provider who are not comfortable initiating the discussions 3. Increase organizational chaos

Note. This table reflects the strengths, weaknesses, opportunities, and threat that may be experienced during the project execution.

Appendix O

Table 1

Gantt Chart



DNP GANTT-Responsibility-Status Chart

START DATE

January 10, 2022

Implementation of Prognosticator Algorithm for Initiation of Serious Illness Discussions and Improving the Rate of Palliative and Hospice Referrals.

Project Name: Prognosticator Algorithm Bu	Assigned to	Status	START DATE	END DATE	# of Days
Assessment Phase			**01/10/22**	**12/09/22**	**240**
Identify a problem	DNP student	Completed	01/10/22	03/04/22	40
Conduct gap analysis	DNP student	Completed	03/14/22	05/06/22	40
Identifying gap and appropriate interventior	DNP student	Completed	03/14/22	12/09/22	195
Project Design Phase			**01/09/23**	**05/30/23**	**102**
Investigate an educational modality	DNP student	Completed	01/09/23	03/03/23	40
Evidence based research	DNP student	Completed	02/28/23	05/17/23	57
Develop an Aim statement/ PICOTs	DNP student	Completed	01/09/23	03/03/23	40
Develop the project intevention	DNP student	Completed	02/28/23	05/17/23	57
Obtain project approval	DNP student	Completed	02/06/23	05/05/23	65
Identify stakeholders team members	DNP student	Completed	01/22/23	05/30/23	92
Finalize and submit project for approval	DNP student	Pending	08/28/23	11/30/23	69
Project Implementation phase			**01/02/24**	**08/05/24**	**155**
Attend stakeholders kick-off meeting	DNP student	Pending	01/02/24	02/09/24	29
Meet with the DNP team	DNP student/ team	Pending	01/22/24	08/05/24	141
Conduct educational / teaching sessions	DNP student/ team	Pending	01/22/24	08/05/24	141
Completed pre-evaluation survey	DNP student/ team	Pending	01/22/24	05/17/24	85
Completed Post evaluation	DNP student/ team	Pending	05/09/24	08/05/24	63
Project Analysis Phase			**01/09/24**	**08/05/24**	**150**
Review Pre-and-post evaluation	DNP student/ team	Pending	03/12/24	08/05/24	105
Data collection and analysis	DNP student/ team	Pending	01/09/24	08/05/24	150
Interpret and integrate data	DNP student/ team	Pending	04/15/24	07/26/24	75
Adjust intervention per data	DNP student/ team	Pending	05/17/24	08/05/24	57
Project Final Phase			**07/01/24**	**12/21/24**	**125**
Debriefing of DNP project	DNP student	Pending	07/01/24	08/16/24	35
Graduation	DNP student	Pending	08/01/24	08/16/24	12
Provide materials for future studies	DNP student	Pending	08/16/24	12/21/24	91

Note. This Gantt Chart shows activities completed and pending for the DNP project.

Appendix P

Table 1

DNP Project Budget

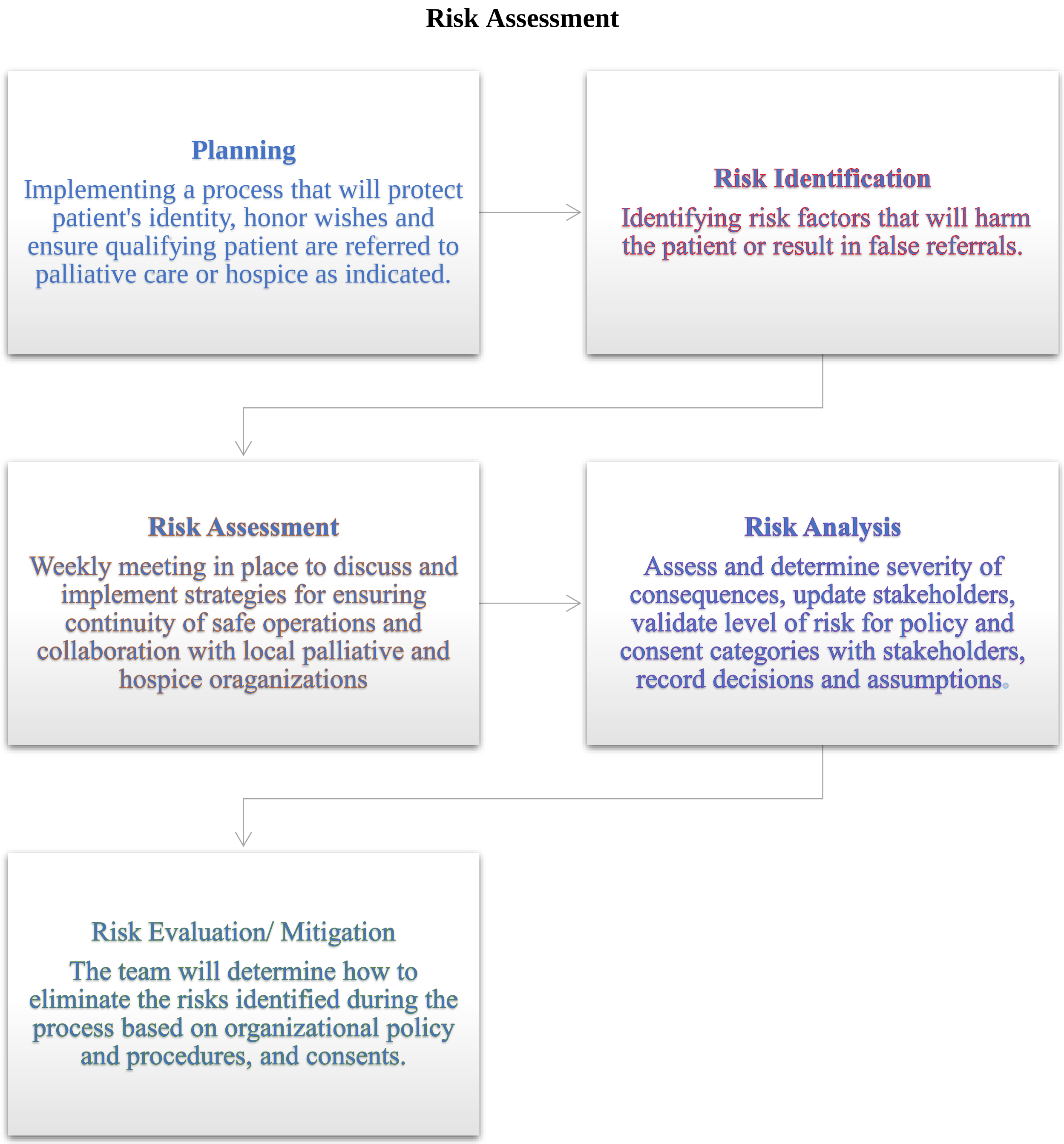
EXPENSES		**REVENUE**	
Direct		**Billing**	$0
Salary and benefits: (1) NP Educator/ Preceptor	$0	Grants	$0
Supplies: Supplies – research document printing and lamination, project cards, and handouts	$219.00	Institutional budget support: Supplies, salaries and benefits, and overhead	$0
Services			
Statistician: paid by DNP student	$0		
Indirect			
Overhead: Overhead - use of educational room x 1hr x 8wks	$225.00		
Total Expenses	$444.00	Total Revenue	$0

Note. This table reflects the expenses and revenue incurred in the course of completing the DNP project.

Appendix Q

Figure 1

Risk Assessment Chart



Note. This figure shows the flow of risk assessment for the DNP project.

Appendix R

Table 1

Organizational Readiness/ Responsibility

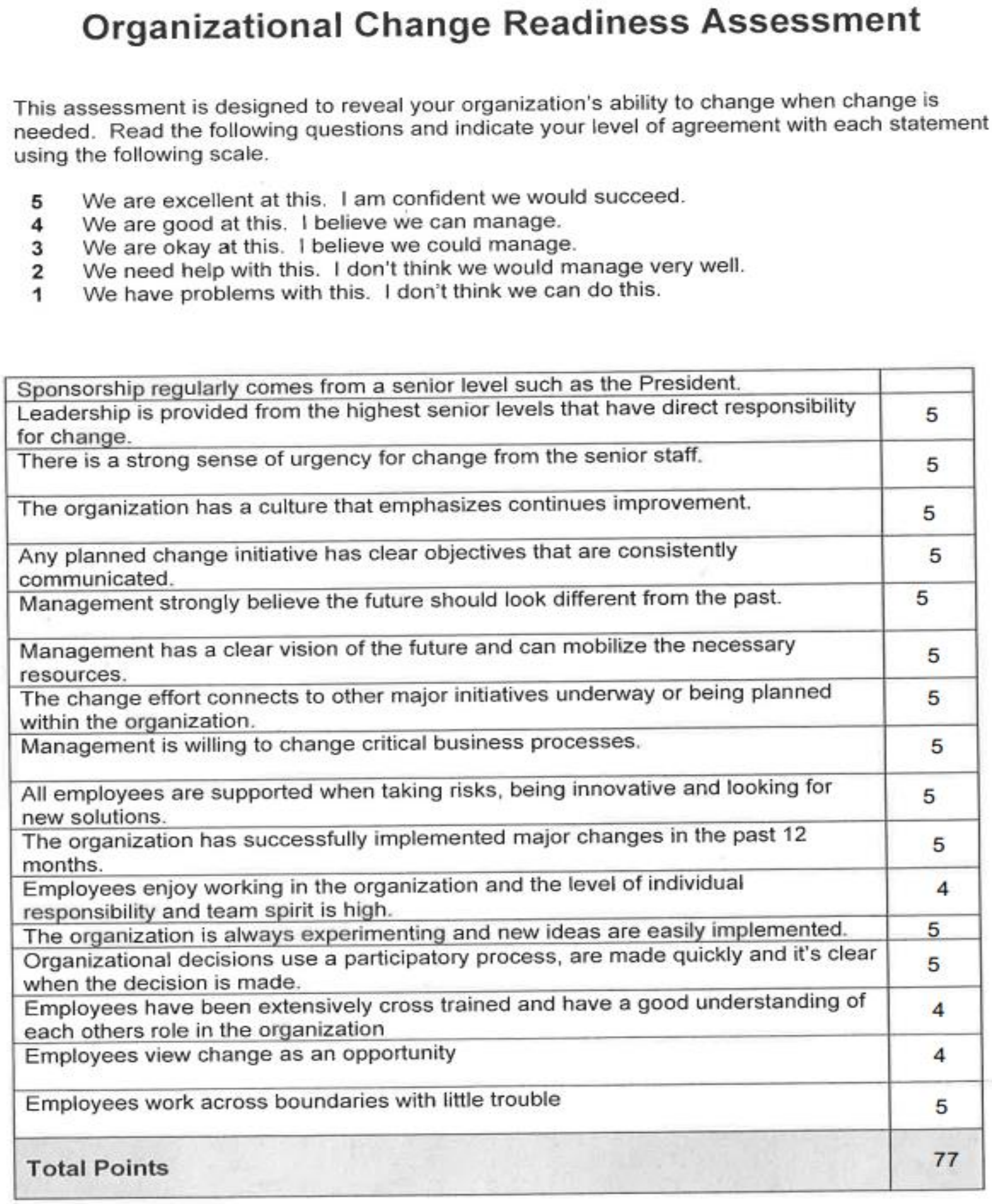
Communication	Purpose	Medium	Frequency	Responsible Persons
Meeting with the organization's management team	Obtain information on organizational goals, policies, and procedures. Review project objectives and PDSA cycles.	Zoom	Monthly	DNP student, CMO, RCMO, Pod leader, practice site manager
DNP student team meetings	Discuss necessary content, education, modality, schedule, and evaluate techniques.	Zoom or in-person at the office	Weekly	DNP student and team members
Training sessions	Education and training to providers utilizing evidence-based practice.	Zoom or in-person	Weekly	DNP students and providers
Data collection and update meetings	Collection pre-and-post evaluation data for analysis.	Zoom or in-person	Weekly evaluations	DNP student, team members, risk management and quality improvement unit.

Note. This table reflects the organizational readiness for the DNP project.

Appendix S

Table 1

Organizational Readiness Assessment



Organizational Change Readiness Assessment

This assessment is designed to reveal your organization's ability to change when change is needed. Read the following questions and indicate your level of agreement with each statement using the following scale.

5 We are excellent at this. I am confident we would succeed.
4 We are good at this. I believe we can manage.
3 We are okay at this. I believe we could manage.
2 We need help with this. I don't think we would manage very well.
1 We have problems with this. I don't think we can do this.

Sponsorship regularly comes from a senior level such as the President.	
Leadership is provided from the highest senior levels that have direct responsibility for change.	5
There is a strong sense of urgency for change from the senior staff.	5
The organization has a culture that emphasizes continues improvement.	5
Any planned change initiative has clear objectives that are consistently communicated.	5
Management strongly believe the future should look different from the past.	5
Management has a clear vision of the future and can mobilize the necessary resources.	5
The change effort connects to other major initiatives underway or being planned within the organization.	5
Management is willing to change critical business processes.	5
All employees are supported when taking risks, being innovative and looking for new solutions.	5
The organization has successfully implemented major changes in the past 12 months.	5
Employees enjoy working in the organization and the level of individual responsibility and team spirit is high.	4
The organization is always experimenting and new ideas are easily implemented.	5
Organizational decisions use a participatory process, are made quickly and it's clear when the decision is made.	5
Employees have been extensively cross trained and have a good understanding of each others role in the organization	4
Employees view change as an opportunity	4
Employees work across boundaries with little trouble	5
Total Points	77

Note. This table reflects the organizational readiness assessment for the DNP project.