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Implementation of a Standardized Suicide Screening Process in a University Student Health Clinic: A Quality Improvement Project

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Clinic: A Quality Improvement Project

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Abstract

Background: Suicide is a leading cause of death among college age students, prompting the need for evidence-based screening tools like the Columbia Suicide Severity Rating Scale (C-SSRS) to enable early detection and timely intervention. Inconsistencies in suicide screening may pose a risk of missed intervention opportunities. This Doctor of Nursing Practice project specifically aimed to improve the quality and consistency of suicide screening in a university student health clinic by implementing the C-SSRS tool into the clinic workflow during mental health appointments. **Methods:** Employing a quality improvement framework, this scholarly project followed the Institute for Healthcare Improvement Model for Improvement and the Plan-Do-Study-Act cycle. The C-SSRS was chosen as the evidence-based screening tool following a literature review and stakeholder meetings. **Interventions:** The project implemented a standardized suicide screening process using the C-SSRS during mental health appointments. Interventions included staff education, electronic health record template development, and clinic rounding for staff support. Staff attitudes were surveyed at the end of implementation. **Results:** Monthly mental health appointments increased during implementation. The C-SSRS was used in 98.06% of appointments. The tool assisted clinicians in the identification of 220 low-risk, 27 moderate-risk, and 6 high-risk patients. Some discrepancies between patients' C-SSRS risk levels and documented care plans using the clinic's suicide risk decision tool were found. **Conclusion:** The project successfully integrated the C-SSRS into the clinic workflow, enhancing standardization and identification of at-risk patients. Continued improvement efforts are recommended for improved documentation efficiency and data collection methods.

Keywords: College health, Columbia Suicide Severity Rating Scale (C-SSRS), mental health, quality improvement, suicide, suicide screening

Implementation of a Standardized Suicide Screening Process in a University Student

Health Clinic: A Quality Improvement Project

In 2021, approximately 1.7 million Americans attempted suicide resulting in 48,000 deaths (The Centers for Disease Control and Prevention [CDC], 2023c). Suicide is the third leading cause of death among individuals ages 15 to 24 in the United States (U.S.), which includes the college student population (CDC, 2023a). The American College Health Association (2023) National College Health Assessment found that of 33,199 students surveyed, 27.6% reported high risk suicidal ideation (SI) or behaviors and 2.5% reported a suicide attempt over the preceding 12 months of evaluation. Additionally, the 2021-2022 Healthy Minds Study surveyed 95,860 U.S. college students and found within the past year, 15% reported SI, 6% had a suicide plan, and 2% attempted suicide (The Healthy Minds Network, 2022). Additionally, the societal impact of suicide carries a large economic burden, with suicides and suicide attempts costing the U.S. over $500 billion in medical costs, work loss costs, value of statistical life, and quality of life costs (CDC, 2023b).

The main risk factors for suicide are depression or other mental health disorders, a previous suicide attempt, substance abuse, family history of suicide, stressful life events, such as losing a loved one, and interpersonal stressors, including shame, bullying, and discrimination (National Institute of Mental Health [NIMH], 2023). Additionally, the COVID-19 pandemic brought social and educational disruption to college students, which negatively impacted many students' mental health. In a mixed methods study by Lee et al. (2021), 83.8% of the 200 U.S. college students surveyed reported an increase in anxiety, depression, or loneliness related to the COVID-19 pandemic during the 2020 spring semester. To implement effective suicide prevention in the college student population, accurate and early identification of at-risk

individuals is necessary (Frick et al., 2021). The Columbia-Suicide Severity Rating Scale (C-SSRS) is an evidence-based suicide screening tool that supports suicide risk assessment through a series of simple questions that can help providers identify those at risk for suicide, assess the severity and immediacy of that risk, and gauge the level of support the person needs (The Columbia Lighthouse Project, 2016a).

Problem Description

Suicide is widely considered a preventable cause of death, highlighting the significance of effective mental health support and intervention strategies. Because suicide is a complex, multi-dimensional health outcome, risk reduction involves the early identification and assessment of individuals with SI (Moutier, 2021). Using an evidence-based suicide screening tool, such as the C-SSRS, not only facilitates early detection but also leads to timely intervention, ultimately preventing suicides (The Columbia Lighthouse Project, 2016a).

Missed Suicide Screening Opportunities

Contact with a healthcare provider is common before a suicide attempt, which highlights the importance of suicide screening, prevention strategies, and timely intervention (Stene-Larsen & Reneflot, 2019). A systematic review of 44 studies from 2000 to 2017 examined the rates of contact with healthcare providers prior to suicide (Stene-Larsen & Reneflot, 2019). Among individuals 25 years and younger, the average rate of contact with a healthcare provider before suicide was 71% 12 months prior, 66% three months prior, 33% one month prior, and 30% one week prior to suicide (Stene-Larsen & Reneflot, 2019). A longitudinal study from 2000 to 2010 within eight Mental Health Research Network healthcare systems examined the timing of health services received in the year prior to suicide (Ahmedani et al., 2014). From 2000-2010, 85% of

the individuals who died by suicide made a healthcare visit within four weeks of death

(Ahmedani et al., 2014).

Supporting Evidence for Timely Intervention

Evidence-based, timely intervention is needed for healthcare professionals to deliver

quality suicide prevention care (Stallman & Allen, 2021). A systematic review identified six

acute suicide prevention interventions:

- pharmacotherapy to improve positive mood states,

- routine observations either constantly or intermittently depending on the situation,

- contracting for safety in which the patient verbally or in writing vows not to harm
  themselves,

- crisis response planning including risk assessment, supportive listening, provision of
  crisis resources, and referral to a mental health professional,

- safety planning in collaboration with a health professional to make their environment
  safer,

- care-collaborate-connect, which was developed from the patient's perspective of "care
  about me, collaborate with me, and connect me with additional support" (Stallman &
  Allen, 2021).

Other intervention strategies for suicide prevention included suicide risk education directed at

healthcare professionals and the general public, cognitive-behavioral therapy to decrease suicidal

behavior risk, and active outreach following a suicide attempt or SI crisis (Mann et al., 2021).

Using an evidence-based suicide screening tool can increase the identification of who is at high

risk and when (Mann et al., 2021). Determination of suicide risk is needed to effectively link

suicidal individuals to timely interventions (Mann et al., 2021).

Project Site Problem

A Tennessee university student health clinic experienced an 85% increase in mental health visits within the last year. Before implementing this Doctor of Nursing Practice (DNP) scholarly project, the suicide screening process in the clinic was not standardized. After interviewing stakeholders and learning about their suicide screening process, the need to implement an evidence-based suicide screening tool into the clinic workflow was identified. Despite strong evidence and clinical recommendations advocating for the use of an evidence-based suicide screening tool, a quality gap remained between these guidelines and clinical practice.

Available Knowledge

The initial step in effective suicide prevention involved identifying individuals at risk of suicide (Brodsky et al., 2018). Evidence-based practice recommendations addressed the fluctuating nature of suicide risk, which required consistent and ongoing risk assessment, intervention, monitoring, and follow-up (Brodsky et al., 2018). The National Action Alliance for Suicide Prevention created the Zero Suicide (ZS) Model framework, which coordinated a multilevel approach to implementation of evidence-based suicide prevention practices in clinical care (Brodsky et al., 2018). Included in the ZS model was the C-SSRS, a validated and reliable tool that measures current and past SI, attempts, and preparatory and self-harming behaviors (Brodsky et al., 2018). The C-SSRS was endorsed as a reliable suicide screening tool by the U.S. Department of Defense, the Food and Drug Administration, the National Institutes of Health, the Substance Abuse and Mental Health Services Administration, World Health Organization, and the CDC (The Columbia Lighthouse Project, 2016a).

The C-SSRS

A systematic review of 206 articles identified 20 instruments used to assess suicide risk, with the two most common being the C-SSRS and the Beck Scale for Suicide Ideation (BSI) (Andreotti et al., 2020). The C-SSRS is a suicide screening tool consisting of four sections and 18 total items with the primary objective of assessing the potential risk of suicide in individuals, regardless of whether they exhibit suicidal tendencies or not, making the C-SSRS a more comprehensive tool compared to the BSI (Andreotti et al., 2020; Gipson et al., 2015). Modifications to the C-SSRS were provided to allow for adaptation to specific settings, although the core questions did not change (The Columbia Lighthouse Project, 2016b). As shown in Figure 1, a six-question screening version of the C-SSRS was developed to help screeners quickly classify suicide risk based on an individual's answers (The Columbia Lighthouse Project, 2016a). Initially developed in the U.S., this tool has been adapted into over 100 languages, with many translations undergoing linguistic validation, allowing the C-SSRS to be most accessible (Andreotti et al., 2020; Gipson et al., 2015; Yershova et al., 2016).

When reviewing the literature, numerous studies cited a 2011 report by Posner et al. Although this report is dated, it remained a valuable source of information regarding the validity and internal consistency of the C-SSRS (Posner et al., 2011). The full version of the C-SSRS, which evaluated the four subscales of severity of ideation, intensity of ideation, behavior subscale and lethality subscale, was assessed in three multisite studies, including a treatment study of 124 adolescents who attempted suicide, a medication efficacy trial including 312 adolescents with depression, and a study of 237 adults presenting to an emergency department for psychiatric complaints (Posner et al., 2011). In the first study of 124 adolescents who attempted suicide, baseline C-SSRS ratings, which were conducted before any treatment was administered and were based on the worst-point lifetime SI, proved to be significant predictors

(Posner et al., 2011). The ratings were associated with an increased risk of suicide attempts

during treatment, with an odds ratio of 1.45 (95% CI, 1.07 - 1.98, $p = 0.02$) (Posner et al., 2011).

Furthermore, an assessment of the C-SSRS intensity subscale was conducted at two time points:

one reflecting the period since the last visit and another for the past week. The internal

consistency of the intensity subscale was high, yielding a Cronbach's alpha of 0.937 for the

period since the last visit and 0.946 for the past week (Posner et al., 2011). This report

highlighted that the C-SSRS is a valuable tool for evaluating SI and suicidal behavior in both

clinical and research settings (Posner et al., 2011).

Supporting Evidence for the C-SSRS

In a mixed methods study to assess the accuracy of the C-SSRS compared to the BSI, 202

participants ages 18 to 40 with schizophrenia spectrum disorders were administered the C-SSRS,

followed by the BSI (Cha et al., 2023). The C-SSRS had a sensitivity of 84.1% and a specificity

of 83.9%, compared to the BSI rates of 83.5% and 81.7% (Cha et al., 2023). Although both tools

have the capability to identify lifetime occurrence of either a single suicide attempt or multiple

attempts, the C-SSRS gathered more data concerning suicidal actions compared to the BSI (Cha

et al., 2023). Unlike the BSI, the C-SSRS differentiated between actual suicide attempts,

interrupted attempts, and aborted attempts, which were predictive of future suicide attempt risk,

making them critical factors for assessment (Cha et al., 2023; Interian et al., 2018).

A research study examined the utility of the Patient Health Questionnaire-9 (PHQ-9)

suicide-risk item with the C-SSRS to identify suicide risk in adolescents and young adults with

Type 1 Diabetes (Moss et al., 2022). Out of 133 participants, 15 screened positive for suicide

using the C-SSRS, whereas only eight screened positive using the PHQ-9. The PHQ-9 under-

identified suicide risk in 46.7% of participants. However, a pilot study was conducted to examine

the utilization of the C-SSRS for suicide screening in combination with an assessment of

depression severity through the PHQ-9 in 30 adolescents ages 14 to 18 with a psychiatric chief

complaint (Weatherly & Smith, 2019). Among the participants, 65% had previously been

diagnosed with depression, and within this subgroup, 83% had a positive C-SSRS score,

indicating that clinical depression is a risk factor for suicide (Weatherly & Smith, 2019). Based

on these results, patients at risk for suicide were connected to appropriate care quickly and

effectively. Integrating the C-SSRS and PHQ-9 together in a suicide and depression screening

process offered an efficient approach to enhance access to appropriate mental health services

(Weatherly & Smith, 2019).

Rationale

A study by Frick et al. (2021) found that implementation of a standardized suicide-

screening program in a Chicago university student health center improved clinician

documentation consistency, increased mental health referrals, and improved staff learning

outcomes related to growth in knowledge and comfort with suicide screening and intervention.

The recommendations for mental health referrals following project implementation increased

from 2.11% to 7.33%, indicating that the interventions had a beneficial effect on suicide

screening and early intervention (Frick et al., 2021). To guide the development and

implementation of the project interventions, the Institute for Healthcare Improvement (IHI)

Model for Improvement was the chosen framework.

Specific Aims

The global aim of this quality improvement (QI) project was to prevent suicide in the

college student population. This scholarly project specifically aimed to improve the quality and

consistency of suicide screening in a university student health clinic by implementing the C-

SSRS tool into the clinic workflow during 100% of mental health, sleep disturbance, and athletic

physical appointments by December 2023. By appropriately screening patients for suicide using

an evidence-based tool, clinicians can detect patients at risk, initiate early intervention, and

ultimately prevent suicide.

Methods

Theoretical Framework

This scholarly project was a QI design that followed the IHI Model for Improvement as

the project framework. This model, illustrated in Figure 2, seeks to accelerate improvement by

asking three questions: "What are we trying to accomplish?", "How will we know that a change

is an improvement?", and "What change can we make that will result in improvement?" (IHI,

2023b). These questions guided the project team in setting aims, establishing measures, and

selecting changes. QI work requires clear and intentional aims that are specific, measurable,

achievable, relevant, and time-specific. Additionally, measures inform the QI team whether the

changes made are leading to improvement. To select changes, the project team developed, tested,

and implemented interventions to determine if the change should be adopted, adapted, or

abandoned. Although not all changes result in improvement, all improvement requires change

(IHI, 2023c).

PDSA Cycle

The Plan-Do-Study-Act (PDSA) cycle is a systematic method used in QI processes to

achieve continuous improvement. As shown in Figure 3, the PDSA cycle facilitated the project

team in strategizing interventions, conducting small-scale pilot tests, analyzing data, and

iteratively refining the interventions (IHI, 2023c). "Plan" is the initial phase in which a problem

or opportunity for improvement is identified and clear objectives are set (IHI, 2023d). The "do"

phase involves implementing the changes or actions identified in the first step, which can be

done on a small scale (IHI, 2023d). After implementing the changes, data are collected and

analyzed to evaluate their impact during the "study" phase (IHI, 2023d). This step helps the

project team identify whether the changes resulted in improvement, had no effect, or caused

other issues in the system. Finally, the "act" phase determines, based on findings from the

"study" phase, whether the changes tested should be adopted, adapted, or abandoned (IHI,

2023d). The PDSA cycle is a continuous and iterative process and is repeated with new tasks or

changes until the project's aim is met (IHI, 2023d).

Supporting Evidence for the IHI Model for Improvement in Healthcare

The IHI Model for Improvement is used internationally across different healthcare

settings to drive and sustain improvements in healthcare quality, enhance patient care, reduce

errors, and address health equity. A successful QI initiative requires the team to understand a

system, define the problem, apply tools to create change, and track data longitudinally to assess

the impact of changes made (Coughlin & Posencheg, 2023). Boudreaux et al. (2016) followed

the Model for Improvement to improve suicide risk screening and detection in the emergency

department. The project team used PDSA cycles to integrate the screening protocol into routine

care and monitoring performance. The result was an improvement in suicide screening from 26%

to 84% and an increase in suicide risk detection from 2.9% to 5.7% (Boudreaux et al., 2016).

Coughlin and Posencheg (2023) stated the Model for Improvement is the most frequently used

QI methodology in neonatology and used this framework to successfully reduce the number of

days to first skin-to-skin contact in premature infants at a California hospital. Boland (2020)

described how following the Model for Improvement and PDSA cycle reduced violence by 40%

in six London psychiatric inpatient facilities and reduced costs related to violence by $194,000.

Patel et al. (2022) highlighted how the Model for Improvement framework and PDSA cycle can increase health equity in value-based care, specifically the Oncology Care model, to identify and overcome barriers to health equity. Across diverse healthcare settings, the IHI Model for Improvement can be used as a guiding framework for QI initiatives, highlighting the model's value and relevance in improving healthcare and patient outcomes.

Context of Project Site

The project site was a student health clinic at a Tennessee university that provided non-emergent outpatient medical care for all currently enrolled undergraduate and graduate students, faculty, and staff. Specifically, the clinic provided assessment and treatment for non-emergent illnesses and injuries, mental health consultations, immunizations, physical exams, laboratory services, travel health, and allergy shots. The clinic was open Monday through Friday between the hours of 8:00 a.m. and 4:30 p.m. and was staffed with three to four nurse practitioners (NPs) and five registered nurses (RNs) daily. The clinic treated students from diverse backgrounds. Data from the university's 2022 school year indicated there were 7,384 undergraduate students and 1,526 graduate students enrolled. Of the student population, 32.9% were male, 66.9% were female, 0.1% were unknown, and 0.1% were unreported. In 2022, the campus population was 77% white non-Hispanic, 21% minority race and ethnicity, which included Hispanic, African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, and two or more races, 1% international, and 1% unknown.

Furthermore, the student health clinic staff worked closely with the university's counseling services to provide convenient access to in-person, professional mental health assessment, emergent care, and short-term solution focused treatment, as well as referral to off-campus specialists and services as needed. The university provided information to students on

how to schedule an appointment with counseling services and recommended seeing a university

counselor prior to visiting with health services. When a student scheduled an appointment with

health services, the initial mental health evaluation was a 40-minute appointment with an NP in

which a care plan was created, which might have included a mental health related medication

prescription and a plan to continue or seek care with counseling services. Additionally, a 40-

minute mental health follow-up appointment was scheduled to provide close monitoring of

mental health medications at regular intervals.

In addition to in-person health care consultations, the university provided students with

remote care options, including a free, confidential, and virtual physical and mental health support

system that was always accessible to students as well as on-demand access to a mental health

professional within three to seven minutes. Additionally, Therapy Assistance Online, a collection

of online tools designed to provide students with effective, evidence-based resources for mental

health care, was freely offered. The university also provided students with college focused and

general mental health resources, such as links to the National Alliance on Mental Health, NIMH,

and Help Guide, which provided recommendations for treatment and self-help suggestions.

Clinic Suicide Screening Process Prior to Project Implementation

Prior to project implementation, students who scheduled a mental health appointment at

the clinic electronically completed the PHQ-9 and Beck Anxiety Inventory (BAI) through their

personal student health portal to screen for depression and anxiety, and the NP reviewed this

information prior to starting the visit. During the visit, the NP also verbally screened the patient

for suicide. However, there was variability of the suicide screening questions and documentation.

According to clinic stakeholders, some providers were more comfortable than others discussing

suicide with patients based on years of experience providing mental health care. The

inconsistency in method and depth of suicide screening contributed to a quality gap and

increased the risk for missed opportunities to identify suicidal patients for early intervention.

Interventions

During the project planning phase from January 2023 through April 2023, the project

leader met with the project faculty advisor, clinic director, assistant clinic director and lead NP,

and clinical data coordinator to determine if the C-SSRS would be an appropriate suicide

screening tool to fit the needs of the clinic patient population and provider workflow. The project

team also collaborated and met with the university's counseling services director and assistant

director to learn about their C-SSRS screening process during counseling appointments, as their

department had already implemented the C-SSRS into their clinic visit workflow. The project

implementation period was from August 23, 2023, through December 4, 2023. A Gantt chart,

shown in Figure 4, was created to show the project timeline and plan the order in which tasks

were completed. A logic model, illustrated in Figure 5, was developed to depict connections

between resources required, actions taken, and future outputs and outcomes related to this

project. The implementation action items included the following:

- implementing a structured suicide screening process using the C-SSRS,

- providing an educational module on the C-SSRS for the clinic staff on August 8, 2023,

- developing the C-SSRS screener version and documentation electronic health record
  (EHR) templates,

- clinic rounding to support NPs during the project implementation phase.

Educational Module for Clinic Staff

The educational module, led by the project leader, consisted of a 20-minute PowerPoint presentation discussing the new suicide screening process steps and how to download and use the free Columbia Protocol mobile phone application to input the patient's C-SSRS answers. The mobile phone application assisted the NPs in determining the patient's suicide risk as low, moderate, or high based on their C-SSRS answers of "yes' or "no" to each question. However, NPs were reminded that this process did not replace their clinical judgement if they felt a patient was at a higher risk than their answers or risk category placed them in. NPs were encouraged to continue verbally asking patients about SI in addition to the screening and if the patient answered "yes" to any screening questions, NPs were encouraged to assess further. Additionally, the project leader guided NPs through an example patient encounter exercise to highlight the importance of asking about suicide using the C-SSRS. A brief paper survey, consisting of three open-ended questions, was administered to NPs at the end of the educational module to collect feedback on the presentation.

Development of EHR Templates

An electronic template including questions one, two, and six of the C-SSRS, shown in Figure 1, became available in the patient's portal 15 minutes prior to their appointment, along with the PHQ-9 and BAI forms. Once the patient completed the three forms, NPs were notified through a color status change in the EHR. If a patient had not filled out the forms before their appointment, the clinic RN guided them to complete the forms electronically. In cases where electronic completion was not possible, paper copies were provided for the patient and then scanned into the EHR for the NP to review.

Suicide Risk Decision Process

If the patient answered "no" to all C-SSRS questions, the NP documented the patient as low-risk in the "plan" section of the mental health EHR template and no further action was needed. However, if during the visit, the patient reported differently, the NP rescreened the patient using the Columbia Protocol mobile phone application. If the patient answered "yes" to any C-SSRS questions, the NP opened the Columbia Protocol mobile phone application and input the patient's answers. The application calculated the patient as low, moderate, or high-risk for suicide. This process was implemented during all mental health, sleep disturbance, and athletic department physical exam appointments. Figure 6 illustrates the suicide risk categories and decision process in more detail.

Clinic Rounding and Surveying

During the implementation phase, the project leader performed weekly, then bi-weekly rounding in the clinic for two months to provide support and answer questions regarding the new suicide screening process. Because the project leader was not a clinic employee, the project leader met with the clinical data coordinator and assistant clinic director on two occasions to review the EHR templates, using a test patient, to have a thorough understanding of how to locate the patients' C-SSRS answers to best support NPs with any difficulties they had. Furthermore, an anonymous Qualtrics survey consisting of four Likert scale questions and one free text question was emailed to NPs at the end of the implementation period to assess staff attitudes toward the suicide screening process and to obtain feedback on whether NPs felt the new process caused appointments to last longer, since data on appointment length could not be accurately collected from the EHR.

Study of the Interventions

A project team meeting was held on September 7, 2023, to discuss the data extraction and evaluation method. The clinical data coordinator accessed the EHR on a secure university computer and extracted data on three separate occasions: September 29, 2023, October 31, 2023, and December 4, 2023. The monthly data extraction dates were chosen to assess for changes in frequency of visit type and risk category as the semester progressed. Additionally, monthly data evaluation allowed the project leader to monitor the use of the C-SSRS and plan of care documentation by the NPs. The data extracted included the date of clinic visit, type of visit, use of the C-SSRS template (yes or no), risk category (low, moderate, or high), and plan of care. The clinical data coordinator de-identified all data and the project leader did not have access to the EHR throughout the project. The data were exported to an Excel document by the clinical data coordinator and emailed as a secure document to the project leader. Neither direct nor indirect identifiers were collected or recorded for data purposes. The de-identified data were stored on the project leader's password-protected laptop.

Measures

Outcome, process, and balancing measures were developed using the IHI Model for Improvement framework. An outcome measure is used to assess the end result of a process and determine how the process impacted the system (IHI, 2023a; Ogrinc et al., 2022). For this QI project, the outcome measure was the percentage of the C-SSRS screening template used in mental health, sleep disturbance, and athletic department physical exam appointments from August 23, 2023, through December 4, 2023. This measure was calculated by dividing the number of times the C-SSRS was used to screen for suicide in the appointment categories by the total number of the appointment categories during the implementation period. At the end of data

collection, the project leader calculated the total number of each appointment type and determined if evaluating each appointment type separately brought value to the project results.

Next, process measures evaluate actions that are directed or known to influence the end result and measure if the steps in the process are performing as planned (IHI, 2023a; Ogrinc et al., 2022). The process measures for this project were the number of low, moderate, or high suicide risk results based on patients' C-SSRS answers, the number of times the plan of care was documented in the EHR by NPs, and the number of discrepancies between patients' C-SSRS answers and clinical judgement or plan of care by NPs.

Finally, balancing measures provide a check on other parts of the system as change is being made to watch for unintended or undesired consequences (Ogrinc et al., 2022). The balancing measure assessed whether NPs perceived that the suicide screening process increased the visit length of mental health, sleep disturbance, and athletic department physical exam appointments. Feedback was obtained through the Qualtrics survey at the end of the implementation phase, which added qualitative context to the project.

Analysis

Descriptive statistics were used to measure the percentage of the C-SSRS screening template used in mental health, sleep disturbance, and athletic department physical exam appointments from August 23, 2023, through December 4, 2023. Using Microsoft Excel, Pivot tables were created monthly to analyze the percentage of times the C-SSRS was used in the selected appointments, the number of times NPs documented a low, moderate, or high suicide risk based on patients' C-SSRS answers, the number of times the plan of care was documented in the EHR, and how often there was a discrepancy between patients' C-SSRS answers and clinical judgement or plan of care by NPs. These data were displayed in bar charts. Data from the

anonymous Likert-scale survey sent to clinic NPs at the end of project implementation were cleaned and assigned numerical values. Descriptive statistics were calculated to understand the central tendency and spread of responses. The data were displayed through a bar chart. Additionally, a qualitative analysis on the open-ended question was performed to gain deeper insight into NPs' thoughts and reasons behind their Likert scale responses.

Ethical Considerations

Prior to implementation, the university's Institutional Review Board (IRB) approved this project as "QI – Not Human Subjects Research." The project leader signed a confidentiality agreement with the university's student health clinic and completed the Health Insurance Portability and Accountability Act (HIPAA) and Collaborative Institutional Training Initiative (CITI) modules through the university. This QI project did not implement interventions that fell outside of the regular duties expected within the student health clinic setting. Additionally, the suicide screening process implemented in this project did not alter the referral or suicide crisis management processes that previously existed in the clinic, as the goal of this project was to standardize the suicide screening process using an evidence-based tool. The screening tool did not replace the NP's clinical judgement. Furthermore, the project leader did not have access to the EHR or personal patient information and was not present in any patient appointments. All data were accessed and deidentified by the clinical data coordinator before exporting information to the project leader. Scholarly project team members did not have any conflicts of interest to disclose.

Results

Intervention Modification

Over the course of this initiative, modifications to interventions were made to best support the clinic workflow during mental health appointments. Specifically, the project leader worked with the assistant director and lead NP to create a mental health care plan template in the EHR to simplify the documentation process. Additionally, the process for categorizing and documenting suicide risk level based on patients' C-SSRS answers evolved over time. Initially, if a patient was considered low risk based on their C-SSRS answers, no further action was required. On September 7, 2023, the project team determined that it was best practice for NPs to document the patient as low risk while also providing the patient with mental health and counseling resources based on recommendations from the Columbia Lighthouse Project (2016a). The mental health care plan template was introduced to NPs on September 21, 2023. Training was provided by the assistant clinic director to NPs during clinic hours. On October 4, 2023, the project leader met with the assistant director and lead NP to review the mental health care plan template and support NPs with the intervention modifications.

Measures and Outcome Details

The implementation phase consisted of 284 appointments. Overall, 258 (90.85%) appointments were successfully completed, with 26 (9.15%) appointments marked as "no-shows." The C-SSRS was used in 253 (98.06%) out of 258 appointments. Of the 258 completed appointments, 82 (31.78%) were initial mental health appointments and 176 (68.22%) were follow-up mental health appointments. There were zero sleep disturbance or athletic department sports physical appointments. Of the five appointments (1.94%) lacking documentation of the C-SSRS, two patients were promptly connected with the campus crisis counselor, two lacked a care plan note, and one received a medication refill. No sleep disturbance or athletic department physical exam appointments were completed. The monthly appointment type and frequency is

shown in Figure 7. The suicide risk level was documented 253 (98.06%) times out of 258

appointments. As shown in Figure 8, there were 220 (86.96%) low risks, 27 (10.67%) moderate

risks, and six (2.37%) high risks documented.

NPs documented the plan of care 254 (98.45%) times out of 258 appointments. Of the

four appointments without a care plan documented, two instances involved low-risk patients, and

in two cases, the C-SSRS was not utilized. The plan of care documentation varied, so the data

was hand-sorted and seven codes, termed care codes, were assigned to categorize the data based

on the common themes observed throughout the free-text documentation by NPs. The care codes

and definitions are displayed in Table 2. Of the seven care codes, there were 58 (22.83%)

existing medication management, 19 (7.48%) mental health resources shared, 51 (20.08%)

initiate medication, 102 (40.16%) existing medication management and counseling, 1 (0.39%)

inpatient, 19 (7.48%) crisis counselor, and 4 (1.57%) psychiatric referral care plans documented,

as illustrated in Figure 9. Of 254 care plans, there were 83 (32.68%) discrepancies between

patients' C-SSRS risk level and NPs' plan of care documentation, based on the clinic suicide risk

decision tool illustrated in Figure 6. The monthly discrepancies are shown in Figure 10. To assess

NPs' attitudes toward the suicide screening process, an anonymous Likert scale survey was sent

via email on November 29, 2023. The survey consisted of four 5-point Likert scale questions,

two free-text questions, and one yes or no question. Seven (100.00%) NPs responded to the

survey. Survey responses are illustrated in Figure 11 and shown in Table 1. One hundred percent

of NPs reported they did not feel the suicide screening process caused appointments to take

longer. An NP provided an additional comment, which stated:

> I had a patient this semester who was admitted to Vanderbilt Psych for observation
>
> because of how she completed the Columbia Screener. She did not share her SI with the

nurse who completed her intake, and had I not reviewed her screening results before I entered the room, I would not have used our time together to prioritize an appropriate response to SI and direct her to the appropriate resources. The screening tool improved ALL aspects of healthcare quality: safety, efficiency, effectiveness, patient-centeredness, timeliness, AND I left clinic that afternoon sure that my patient was safe and that I had done the best I could. This peace of mind is priceless. With the high risk and high acuity of our patients right now, adding this tool to our practice and knowing that ALL providers are using it, unburdens my heart and supports my practice.

Intervention Impact: Context, Associations, and Unexpected Events

During the implementation phase, the total number of mental health appointments increased monthly from August through November, with the highest volume in November. Additionally, the frequency of discrepancies of patients' C-SSRS answers and NPs' documented plan of care increased monthly from August through November. Based on the clinic suicide risk decision tool, among 83 discrepancies, the largest observed was that for 67 (80.72%) patients categorized as low risk, the NP did not include a counseling referral or provide mental health resources in their documentation. Additionally, out of the 83 discrepancies, 16 (19.28%) patients identified as moderate risk lacked documentation that the NP had contacted the crisis counselor. There were zero (0.00%) high risk patients with a documentation discrepancy. Finally, an unexpected suicide occurred on campus during the implementation phase, which reinforced the importance and timeliness of the project.

Discussion

The purpose of this scholarly project was to improve the quality and consistency of suicide screening in a university student health clinic by implementing the C-SSRS tool into the clinic workflow during all mental health, sleep disturbance, and athletic physical appointments. Total mental health appointments steadily increased from August to November 2023. Specifically, a 71% increase in total mental health appointments occurred from September to October. Additionally, as monthly mental health appointments increased, so did the acuity of suicide risk levels based on patients' C-SSRS answers. The largest increase occurred from October to November, with the number of patients classified as moderate-risk increasing from seven to 15. The increase in appointment volume and suicide risk acuity level could be attributed to the pressure of midterm exams, demanding class workloads, and heightened stress levels experienced by students in the middle of the semester. There were no sleep disturbance or athletic department sports physicals during the implementation phase.

Association of Project Interventions and Outcomes

The project interventions, specifically the C-SSRS educational module and clinic rounding, facilitated NPs in integrating the C-SSRS screening tool and mental health care plan template into the clinic workflow. Within the first month of implementation, the C-SSRS was used in 100% of mental health appointments, demonstrating the tangible benefits derived from the educational module and clinic rounding. NPs documented the suicide risk level using the C-SSRS template in 98% of mental health appointments, further supporting the positive impact of the educational module, clinic rounding, and staff training on the template. While the mental health care plan template helped streamline the documentation process, variability in NPs' plan of care documentation remained, primarily because most used free text.

A surprising finding was the number of discrepancies between patients' C-SSRS risk level and NPs' plan of care documentation, based on the clinic suicide risk decision tool. On September 7, 2023, the project team modified the documentation process for low-risk patients, asking NPs to document the patient as low risk while also providing mental health and counseling resources. This change was communicated to clinic staff via email by the assistant clinic director/lead NP. Prior to September 7, there were four documentation discrepancies for low-risk patients and two for moderate-risk patients. After implementing the new documentation process, 63 discrepancies were identified for low-risk patients, and 14 for moderate-risk patients throughout the remaining implementation phase. The total documentation discrepancies increased monthly from September through November. Discrepancies could have been attributed to the high volume of mental health appointments daily, time constraints between appointments, inefficient documentation workflow, or clinician burnout (Budd, 2023). Furthermore, the standardized suicide screening process did not replace NPs' clinical judgment. The determination of patients' suicide risk level and the selection of an appropriate care plan was also influenced by the provider's direct encounter with the patient and their clinical judgment.

A similar QI initiative by Frick et al. (2021) implemented a standardized suicide screening process at a Chicago university's primary care center, which examined EHR adaptations, documentation consistency, and mental health referral tracking. Before the initiative, clinicians documented 11 suicide risk progress notes, which increased to 93 post-implementation (Frick et al., 2021). Check boxes were incorporated to record documentation and plan of care in the EHR progress notes for suicidal patients, which improved NP documentation quality and consistency. Despite being conducted at a larger university with more expansive student healthcare services, the standardization and consistency of clinician documentation, achieved

through educational training and implementation of a standardized suicide screening process, aligned with the findings from the current QI project. Frick et al. (2021) identified 66 mental health referral recommendations prior to program implementation and 237 following implementation. These findings are comparable to the current QI project's results, where 145 patients were connected to timely mental health care, including campus counseling, mental health resources, inpatient care, crisis counselor connection, and psychiatric referral.

Social Impact and Contextual Considerations

This scholarly project resulted in NPs successfully screening 253 patients for suicide using an evidence-based tool, including 27 moderate-risk and six high-risk patients, and promptly connecting them with the appropriate resources. The standardized suicide screening tool assisted NPs in identifying at-risk patients and facilitating timely connections with the resources they required. The addition of a crisis counselor to the campus counseling center played an important role in this project, enabling the timely connection of 19 patients who required immediate support. This facilitated a safe and comprehensive determination of next steps based on the patient's suicide risk-level and needs. Additionally, collaborating with the university's campus counseling center provided additional support, given their prior use of the C-SSRS for suicide screening even before the initiation of this project. Health services and campus counseling serve many shared clients. Therefore, implementing the C-SSRS at both locations not only fosters a sense of cohesive care but also enables the monitoring of suicide-risk trends among individuals.

Project Strengths and Limitations

A key project strength was strong stakeholder engagement and participation throughout the entire project. This collaborative approach facilitated the establishment of a shared vision,

alignment of goals, secured project buy-in and commitment, and provided valuable feedback for continuous improvement across multiple PDSA cycles. Additional strengths included improved quality and consistency in suicide screening during mental health appointments, enhanced staff education regarding the C-SSRS, the establishment of a comprehensive data collection process for stakeholders to review and monitor as needed, and the refinement of the process for promptly connecting patients with appropriate mental health resources. This project had several limitations. A key limitation to the generalizability of this project is the context of the university, which has an established, on-campus health services center and comprehensive counseling center offering free services to students. It is important to recognize that not all college campuses share the same abundance of resources, potentially limiting the feasibility and sustainability of similar projects in other settings.

Utilization of the Columbia Protocol mobile phone application for entering patients' C-SSRS answers proved to be an additional step that was time consuming for NPs and ultimately did not yield the anticipated level of utility. The purpose of using the application was to categorize patients as low, moderate, or high suicide risk based on their C-SSRS score and to rescreen patients during the encounter if an error was made during the initial completion of the C-SSRS through their portal. An NP provided a comment in the survey stating, "integrating scoring into the EHR would be beneficial and save time." Streamlining technology to improve the efficiency of identifying patients' suicide risk level was considered for sustainability purposes. Finally, the entire project, including planning, implementation, data collection, and analysis was constrained by the academic calendar of this scholarly project. Both project implementation and data collection were confined to a single semester.

Implications for Practice and Actionable Recommendations

Sustainability is an important aspect of QI, encompassing an ongoing, systematic effort to improve outcomes and system performance while providing excellent direct patient care (Mortimer et al., 2018). A stakeholder meeting was held on March 19, 2024, to discuss project findings and identify a sustainability plan. Sustainability recommendations followed an "adopt, adapt, abandon" approach, as shown in Figure 12. To advance this QI initiative, several key factors were discussed. These included ongoing collaboration with health services and counseling to maintain and extend the suicide screening process and mental health resource connections. Stakeholders were encouraged to create a policy delineating the suicide screening process, documentation expectations, and resource connections. Adjusting the frequency of data collection from monthly to quarterly or bi-annually was determined to be more feasible. Stakeholders agreed that standardizing the care plan documentation template to minimize free text might help with suicide risk level identification, documentation, and evaluation. Finally, stakeholders are currently exploring the possibility of hiring a psychiatric NP to serve as a mental health expert. This addition could further strengthen the initiative and decrease the mental health appointment load for other NPs in the clinic. The project team plans to disseminate through writing, an oral presentation, and poster presentations to share key findings with clinic staff, counseling services, community health partners, and professional colleagues interested in improving college mental health.

Conclusion

In conclusion, this DNP scholarly project successfully introduced a standardized suicide screening process in a university student health clinic, which enhanced the quality and consistency of suicide screening, EHR documentation, and prompt connection to mental health resources. The implementation of the C-SSRS, in combination with NPs' clinical judgement

skills, decreased the risk for missed opportunities to identify suicidal patients for early

intervention. To implement an effective suicide prevention measure, accurate and early

identification of at-risk individuals is necessary (Frick et al., 2021). From late August through

early December, 253 patients were screened for suicide using the C-SSRS. Clinic NPs embraced

the screening process and adjusted to the documentation workflow, even amid a high

appointment volume semester. However, a monthly rise in documentation discrepancies between

patients' C-SSRS risk levels and NPs' plan of care documentation highlighted the necessity for

additional staff education and the development of a more streamlined EHR template for

documentation. Additionally, the occurrence of an unexpected suicide on campus during project

implementation further underscored the importance and urgency of the project. Using an

evidence-based suicide screening tool, such as the C-SSRS, not only facilitates early detection

but also leads to timely intervention, ultimately preventing suicides (The Columbia Lighthouse

Project, 2016a).

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Table 1

Anonymous 5-Point Likert Scale Survey Responses from NPs (N = 7)

Question	Neither Agree nor Disagree		Agree		Strongly Agree	
	n	%	*n*	%	*n*	%
The Columbia suicide screener is clear and easy to understand.	0	0.0	3	42.9	4	57.1
The Columbia suicide screener effectively helps in identifying individuals at risk of suicide.	0	0.0	3	42.9	4	57.1
The Columbia suicide screener is quick and efficient to use in a busy healthcare setting.	1	14.3	3	42.9	3	42.9
I feel adequately trained and confident in using the Columbia suicide screener.	0	0.0	5	71.4	2	28.6

Note. All fields for Strongly Disagree and Disagree were 0 (0.0%).

Table 2

EHR Mental Health Care Plan Documentation: Care Code Terms and Definitions

Care Code Term	Definition
Existing Medication Management	An established patient on medication for mental health purposes presented to the clinic for continuation or adjustment of current medication and/or dosage
Mental Health Resources Shared	NP provided patient with information on campus counseling, virtual mental health care, and off-campus mental health resources
Initiate Medication	New patient presented to the clinic for mental health purposes and was started on a new medication
Existing Medication Management and Counseling	An established patient presented to the clinic for active medication management and received information on counseling and virtual mental health resources
Inpatient	Patient presented to the clinic for mental health purposes and needed inpatient psychiatric care
Crisis Counselor	NP promptly connected the patient with the campus crisis counselor either by telephone or by escorting the patient to campus counseling
Psychiatric Referral	NP determined the patient needed further evaluation and/or care management by psychiatry and referral was completed

Figure 1

COLUMBIA-SUICIDE SEVERITY RATING SCALE
Screen Version - Recent

	Past month	
Ask Questions 1 and 2	**YES**	**NO**
1) *Have you wished you were dead or wished you could go to sleep and not wake up?*		
2) *Have you actually had any thoughts of killing yourself?*		
If YES to 2, ask questions 3, 4, 5, and 6. If NO to 2, go directly to question 6.		
3) *Have you been thinking about how you might do this?* E.g. "*I thought about taking an overdose but I never made a specific plan as to when where or how I would actually do it….and I would never go through with it."*		
4) *Have you had these thoughts and had some intention of acting on them?* As opposed to "*I have the thoughts but I definitely will not do anything about them."*		
5) *Have you started to work out or worked out the details of how to kill yourself? Did you intend to carry out this plan?*		

	YES	NO
6) *Have you ever done anything, started to do anything, or prepared to do anything to end your life?* Examples: Took pills, tried to shoot yourself, cut yourself, or hang yourself, took out pills but didn't swallow any, held a gun but changed your mind or it was grabbed from your hand, went to the roof but didn't jump, collected pills, obtained a gun, gave away valuables, wrote a will or suicide note, etc. **If YES, ask: *Was this within the past three months?***		

☐ Low Risk
☐ Moderate Risk
■ High Risk

Note. From *The Columbia Protocol for Healthcare and Other Community Settings,* by The Columbia Lighthouse Project, 2016. (https://cssrs.columbia.edu/the-columbia-scale-c-ssrs/cssrs-for-communities-and-healthcare/#filter=.general-use.english). In the public domain.

Figure 2

The Institute for Healthcare Improvement Model for Improvement
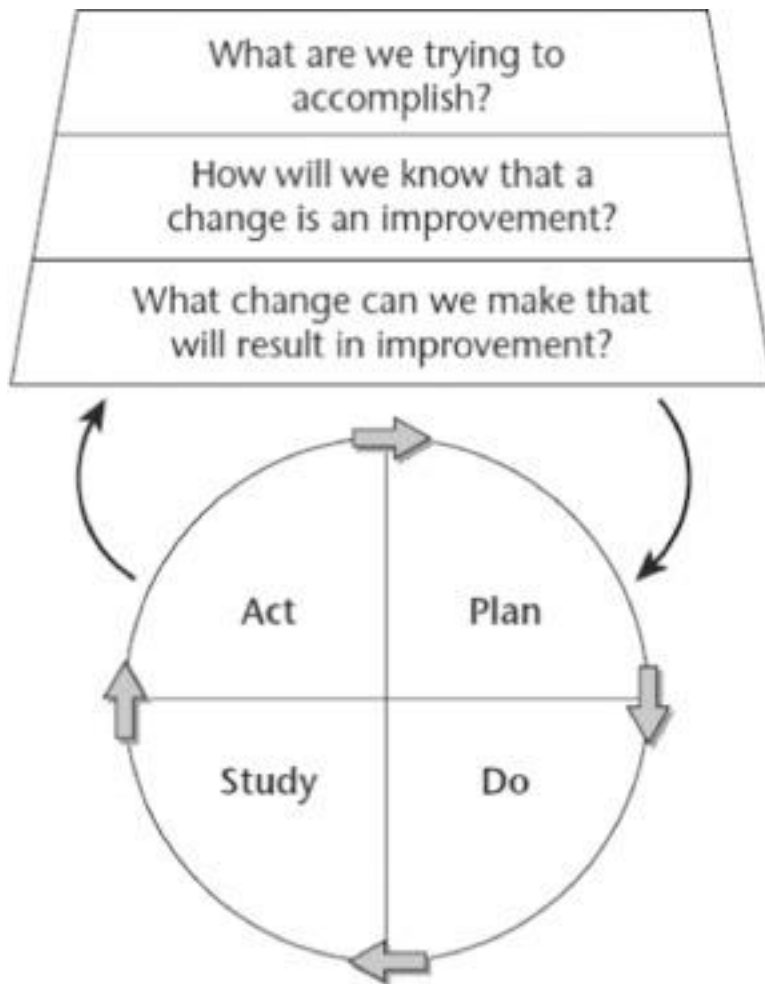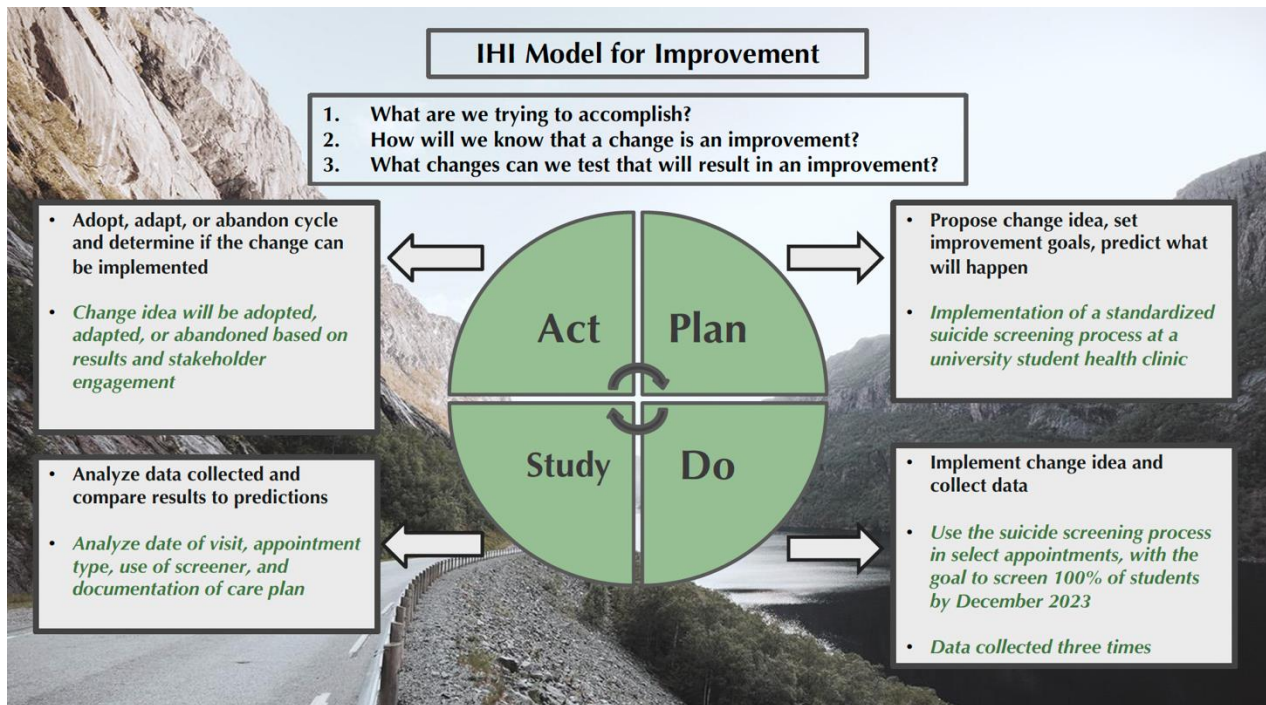

Note. From *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* (p. 24), by G. L. Langley, R. Moen, K. M. Nolan, T. W. Nolan, C. L. Norman, and L. P. Provost, 2009, Jossey-Bass (https://books.google.com/books?id=kE4aEnZgBO8C&printsec=frontcover#v=onepage&q&f=false). Copyright 2009 by G. L. Langley, R. Moen, K. M. Nolan, T. W. Nolan, C. L. Norman, and L. P. Provost. Reprinted with permission.

Figure 3

Main Project Elements Within the Model for Improvement

Note. This figure demonstrates how the IHI Model for Improvement was used to guide and develop the project's main change ideas. Adapted from *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* (p. 24), by G. L. Langley, R. Moen, K. M. Nolan, T. W. Nolan, C. L. Norman, and L. P. Provost, 2009, Jossey-Bass (https://books.google.com/books?id=kE4aEnZgBO8C&printsec=frontcover#v=onepage&q&f=false). Copyright 2009 by G. L. Langley, R. Moen, K. M. Nolan, T. W. Nolan, C. L. Norman, and L. P. Provost. Reprinted with permission.

Figure 4

Scholarly Project Gantt Chart
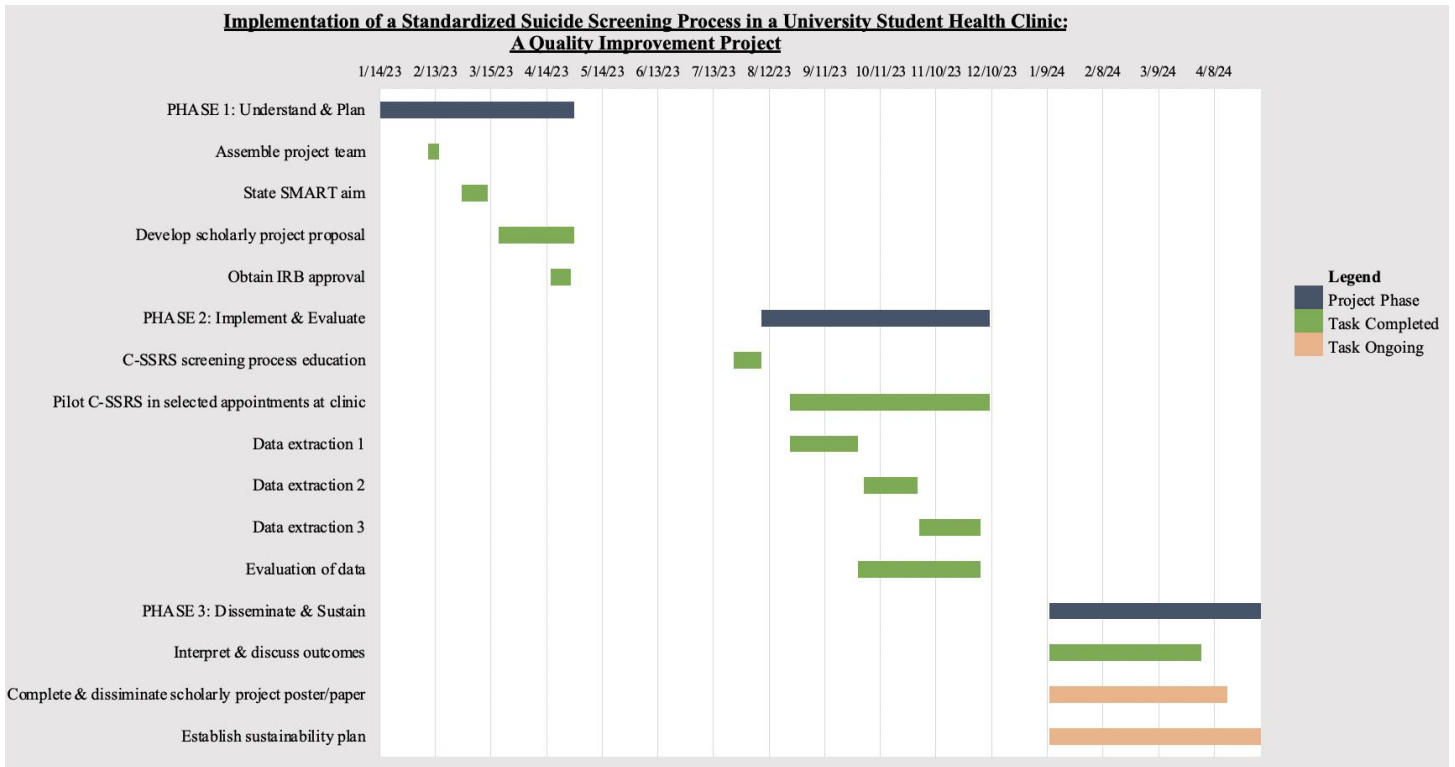
Note. The Gantt chart visually displays the project across three phases and shows the timeline for each main task.

Figure 5

Suicide Screening Process Logic Model
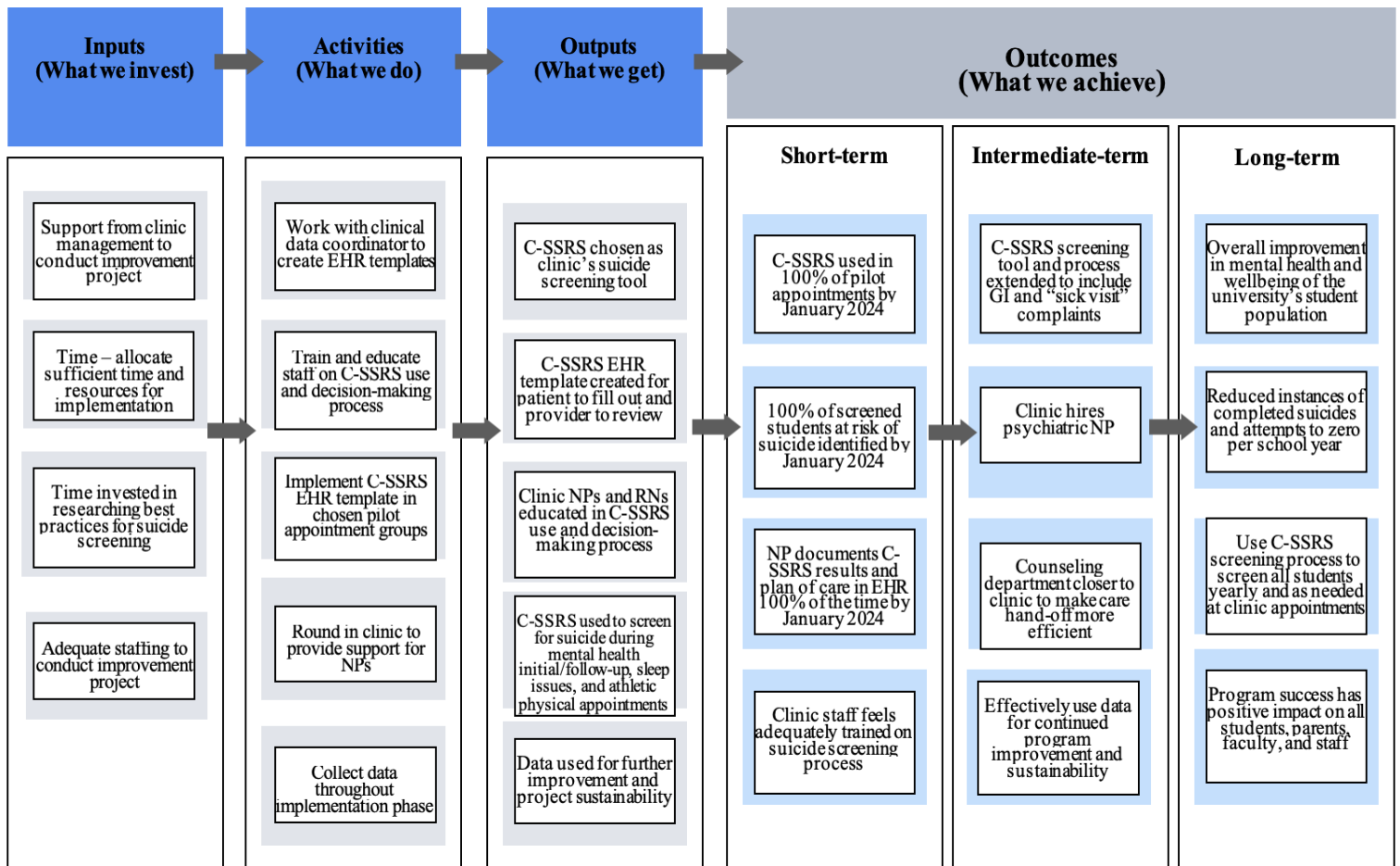
Figure 6

Columbia Protocol Mobile App Risk Categories and Clinic Suicide Risk Decision Tool
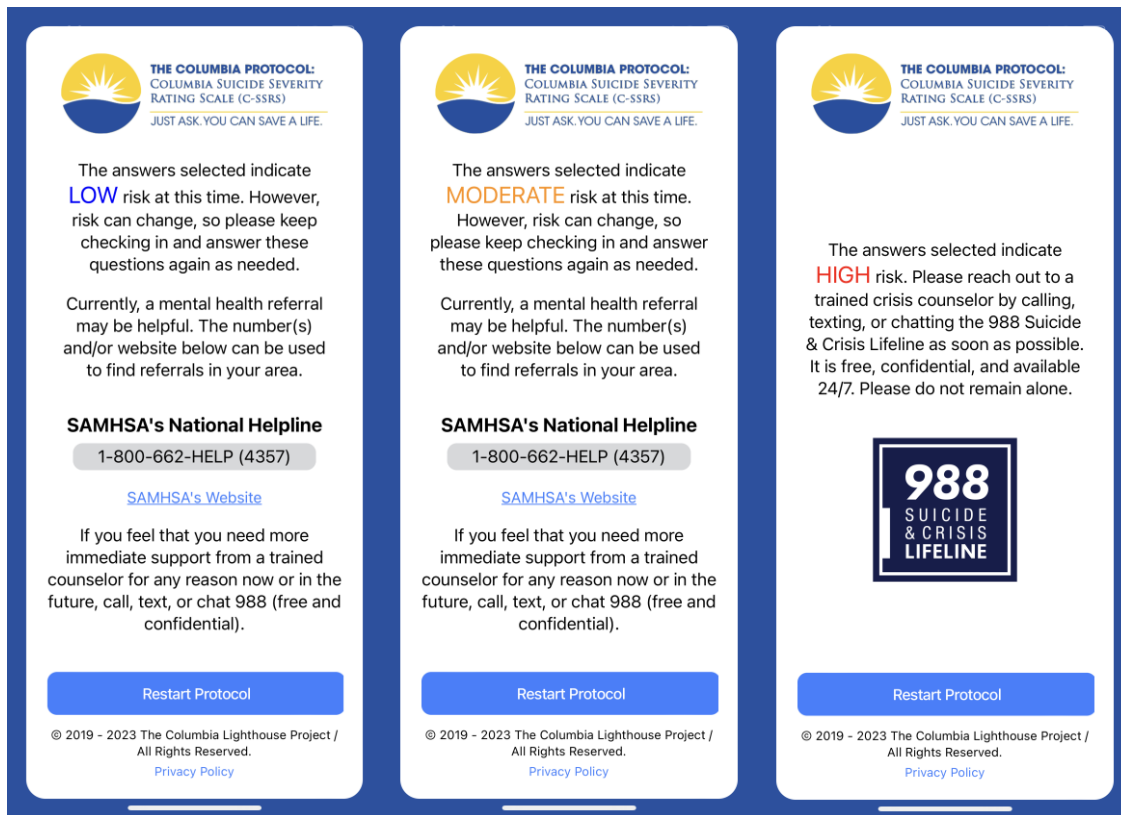
Note. From *The Columbia Protocol: Columbia Suicide Severity Rating Scale (C-SSRS) Mobile Application,* by The Columbia Lighthouse Project, 2016.
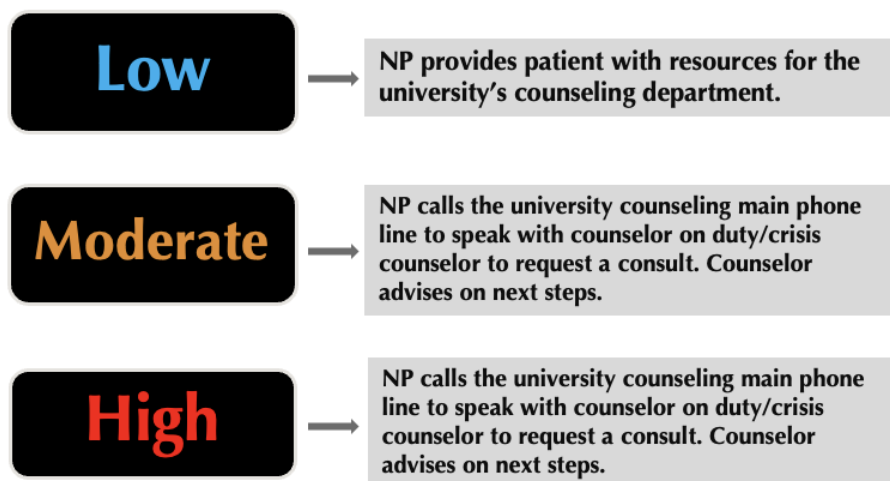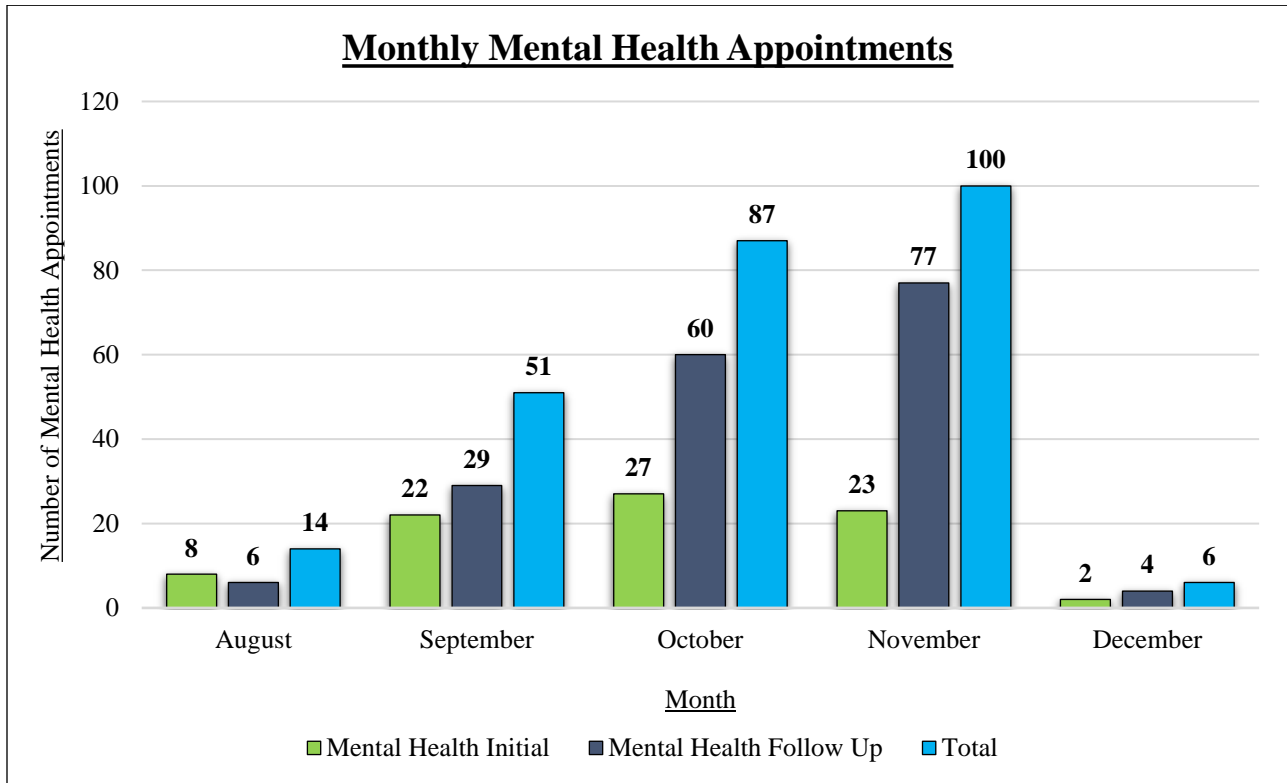
(https://apps.apple.com/us/app/columbia-protocol/id1450966911). In the public domain.

Figure 7

Monthly Mental Health Appointments from August 23, 2023 – December 4, 2023

Note. There were no sleep disturbance or athletic department physical exam appointments during

the data collection period.

Figure 8

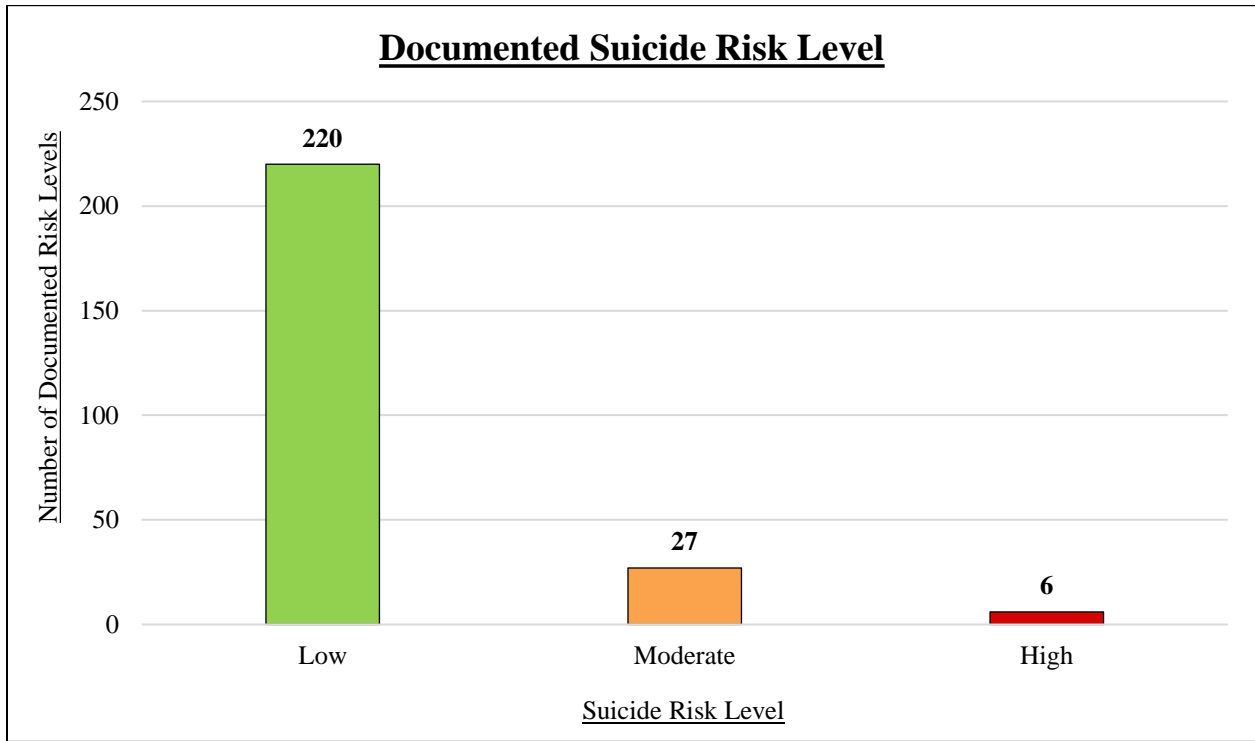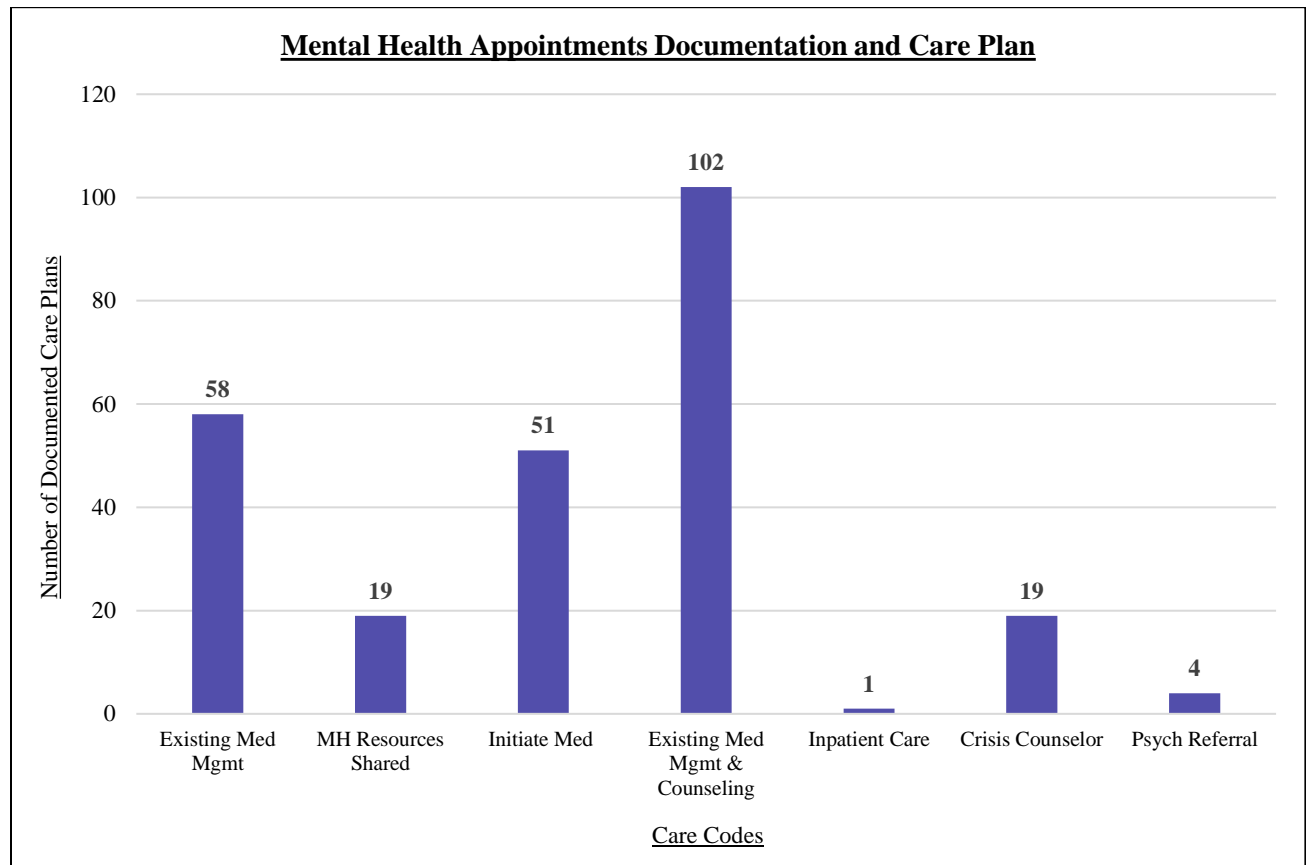*Documented Suicide Risk Levels Based on Patients' C-SSRS Answers*

Figure 9

Type and Frequency of Mental Health Care Plans Documented by NPs

Note. Existing Med Mgmt = Existing Medication Management; MH Resources Shared = Mental

Health Resources Shared; Initiate Med = Initiate Medication; Existing Med Mgmt & Counseling

= Existing Medication Management and Counseling; Psych Referral = Psychiatric Referral.
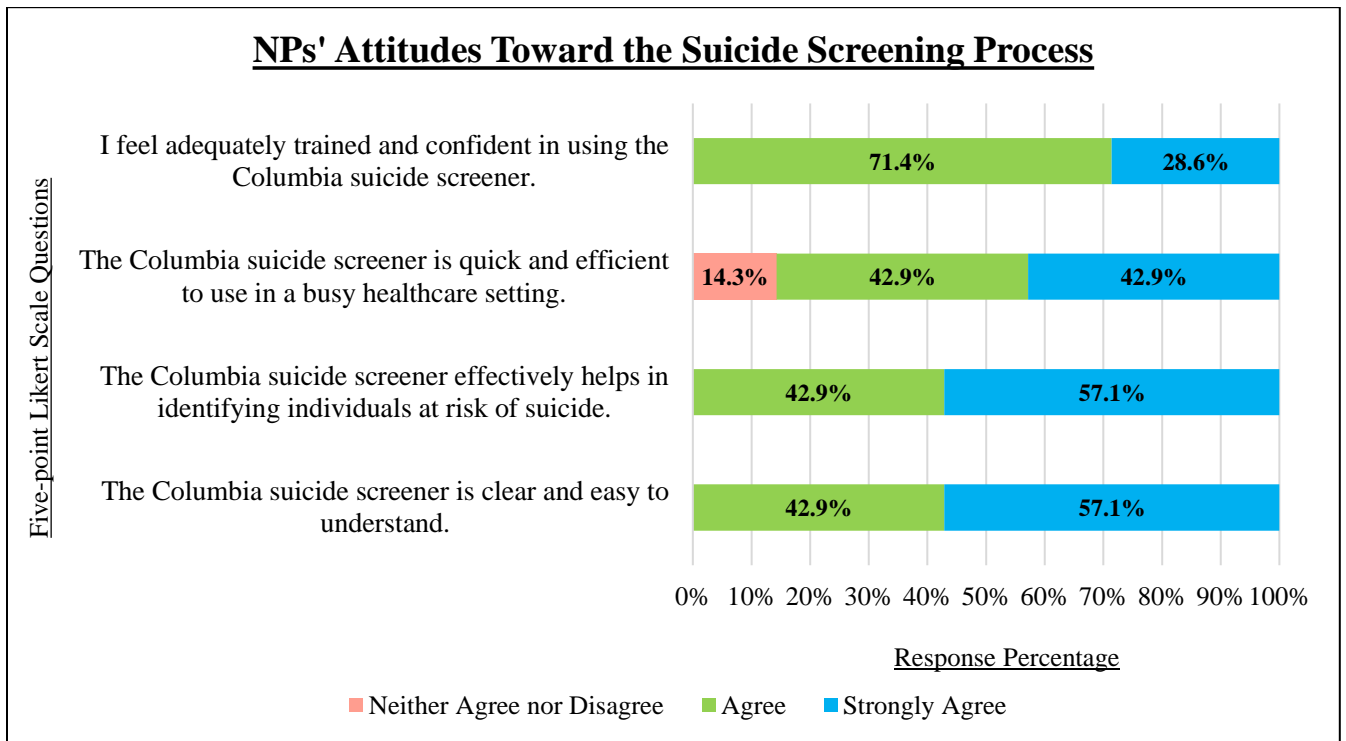
Figure 10

Monthly Discrepancies of Patients' C-SSRS Answers and NPs' Documented Plan of Care
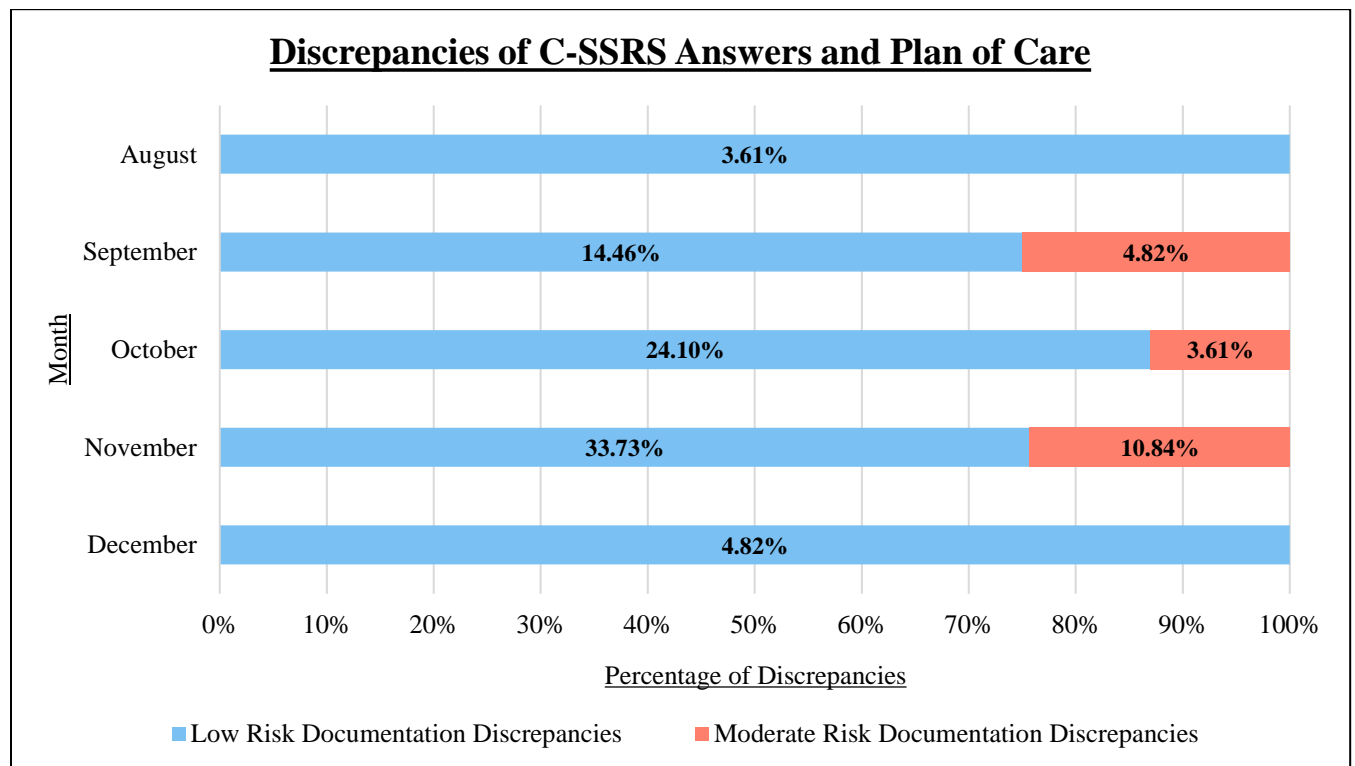
Note. In total, there were 83 discrepancies. There were 67 (80.72%) patients categorized as low risk in which the NP did not include a counseling referral or provide mental health resources in their documentation. There were 16 (19.28%) patients identified as moderate risk, where it was not documented that the NP had contacted the crisis counselor. There were zero (0.00%) high risk patients with a documentation discrepancy. This figure illustrates the monthly percentages of low and moderate risk patients with documented plan of care discrepancies based on the clinic suicide risk decision tool illustrated in Figure 6.

Figure 11

Anonymous 5-Point Likert Scale Survey Responses from NPs

Note. All fields for Strongly Disagree and Disagree were 0 (0.0%).

Figure 12

"Adopt, Adapt, Abandon" Actions for Project Sustainability

Adopt	**Adapt**	**Abandon**
C-SSRS as screening tool to screen for suicide in mental health appointments. Use C-SSRS in all mental health initial and follow-up appointments. If patient scores as moderate or high risk on C-SSRS, call crisis counselor and/or walk patient to counseling if the NP's clinical judgement aligns.	Adjust the mental health plan EHR template to include seven "care codes" with free text option for each, plus an "other" option so NPs can document important information easily and efficiently. The care codes will improve data collection and tracking efficiency. Establish a policy for the suicide screening process, documentation, and mental health resource connectivity process. Identify a champion to continue the process.	To streamline technology, abandon the Columbia mobile app to determine patient's suicide risk level. Instead, create a scoring system in the EHR to eliminate this step and save time.