Implementing a Head Injury Assessment Protocol in Pediatric Mental Health Facility: A Quality Improvement Project

Helen Liu

Oregon Health & Science University

NURS 703: DNP Project

Dr. Sharon Norman

April 23, 2022

Author Note

We have no conflicts of interest to disclose.

Table of Contents

Abstract

Background

Among adolescents and young adults, nonsuicidal self-injury has a prevalence between 7.5-46.5%, with 21-44% in the form of head banging, a behavior that can carry complications ranging from concussions to neurodegenerative diseases.

Local problem

At a Pacific Northwest pediatric mental health facility, the current head injury protocol does not reflect current evidence-based practices and has low adherence.

Methods

The framework for this project is Institute for Healthcare Improvement's Model for Improvement, incorporating Plan-Do-Study-Act. There was a need for a standardized head injury assessment, guidelines for those who sustain a head injury but do not meet concussion criteria, and education sessions regarding protocols for the psychiatric technicians.

Intervention

The current protocol was modified to reflect current evidence which included assessment and activity restrictions. The revised protocol was implemented after psychiatric technicians completed education on the updated protocol. Measures were completion rates of head injury assessments and psychiatric technicians' knowledge of the revised protocol. Knowledge of the protocol was assessed with a pre- and post-education session evaluation. Chart reviews measured adherence to the protocol by tracking documentation rates of baseline and follow-up assessments after a head injury was sustained. Run charts were used to track and display data.

Results

Post-implementation, there was an increase in adherence to the evidence-based head injury assessment protocol. Psychiatric technicians demonstrated increased knowledge of protocol after education.

Conclusions

Evidence-based protocols can be successful in reducing the risk of complications and improve health outcomes. Education sessions are an efficient way to teach information.

Keywords: nonsuicidal self-injury, head banging, concussions, pediatric mental health, quality improvement, evidence-based protocol

Introduction

Problem Description

Head banging is a self-injurious behavior in which individuals hit their head with parts of their body or onto surfaces. The action may not always be repetitive, purposeful, or carry a suicidal intent. These characteristics can determine whether it is nonsuicidal self-injury or one of its differential diagnoses. According to the American Psychiatric Association (2013), nonsuicidal self-injury (NSSI) is 'intentional self-inflicted damage to the surface of his or her body… with the expectation that the injury will lead to only minor or moderate physical harm" (p. 803). Differentials include stereotypic movement disorder, which is a "repetitive, seemingly driven, and apparently purposeless motor behavior" (p. 77) and suicidal behavior disorder is "a suicide attempt… does not involve self-injury directed to the surface of the body undertaken to induce relief from a negative feeling/cognitive state or to achieve a positive mood state" (p. 801).

NSSI is most common among adolescents and young adults, with a prevalence between 7.5-46.5% among adolescents (Cipriano et al., 2017). This systematic review further found an average age of onset is between 12-14 and is associated with various comorbidities including borderline personality disorder and eating disorders. Of those who self-harm, 21-44% takes the form of head banging (Chester & Alexander, 2018). Head banging can have short- and long-term complications. On the minor end, there can be symptoms such as altered mental status, nausea and vomiting, and headache as a result of traumatic brain injuries (TBI) (Buttaravoli & Leffler, 2012). On the more severe end, there can be brain injury, hematomas, and hemorrhages (Fasano & Galluccio, 2018; Gulinaeu-Morel et al., 2019). There is also an increased risk for conditions such as second impact syndrome, cerebral edema, and the development of neurodegenerative diseases (Keough et al., 2020). Cognitive injuries can negatively affect mental health treatment

as the patient has difficulties with memory, attention, and executive function (Chester & Alexander, 2018).

In a local short term, residential inpatient psychiatric facility (Subacute), the current protocol that applies to head banging and injuries is out of date and does not reflect the most current evidence-based practices. The protocol has minimal guidance in assessment or complications of TBIs. In addition to the lack of standardized practice among the nurses, there is low adherence to the protocol, with inconsistent assessment frequency and documentation. These were determined to be the focus of this project after developing and analyzing a cause-and-effect diagram (see Appendix A). Reasons why assessments were not completed in the pre-intervention period are listed in Table 1. From July 2021 to September 2021, baseline assessments were completed 66.67% of the time and follow-up assessments were completed 25% of the time. When the assessment is performed, there is no standardized practice among the nurses.

Available Knowledge

A literature search identified 24 manuscripts. Seven papers were related to psychiatric diagnoses and comorbidities commonly associated with head banging and subsequent head injuries. Seventeen papers were related to concussions and the assessment of management of concussions. The majority of the studies carried low levels of evidence, including six level IV cohort and cross sectional studies (Gioia et al., 2008; Keough et al., 2020; Moran et al., 2018; Nakhjavan-Shahraki et al., 2017; Wilmoth et al., 2020; Yorke et al., 2017), four level V meta-analyses (Kukielka, 2020; Gwyther et al., 2017; McAvoy et al., 2020; Timberlake et al., 2020), two level VI descriptive analyses (Chester & Alexander, 2018; Monto et al., 2018) and six level VII case and clinical reports and expert opinions (Fasano & Gulluccio, 2018; Gulineau-Morel et al., 2019; Halstead, 2018; Halstead et al., 2018; Najerm et al., 2018; Scorza & Cole, 2019). The

remaining manuscripts included one level III clinical review (Matsuzak et al., 2018) and five level I papers that include one systematic review (Cipriano et al., 2017), three clinical practice guidelines (Croke, 2019; Putman & Zysk, 2019; Lumba-Brown et al., 2018), and the Diagnostic and Statistical Manual of Mental Disorders or the DSM-5 (American Psychiatric Association [APA], 2013).

A combination of individual factors and environmental factors are the strongest predictor for head banging (Cipriano et al., 2017). Individual factors are internal and include emotional dysregulation and psychiatric disorders in which children are unable to appropriately express their emotions whether it be underexpressing or overexpressing. In those who have autism, 63% head bang (Kukielka, 2020). Environmental factors are external and include childhood trauma and disrupted parental attachment.

There are various drivers that motivate people to head bang and self harm. Mental or emotional distress can lead to suicidal ideation and the use of maladaptive coping skills for regulation (Chester & Alexander, 2018; Cipriano et al., 2017). This can be a learned behavior after having experienced a relief of positive or negative emotions from past self harm behaviors and can feel like a compulsion or addiction (APA, 2013, Gwyther et al., 2017). Head banging can also be a result of psychiatric or neurologic conditions such as psychosis or autism, in which the behavior does not necessarily carry an intent to seriously injure (Chester & Alexander, 2018; Kukielka, 2020).

Complications of head banging can affect medical, psychiatric, and social health. Medical injuries include those visible to the naked eye such as cuts, bruises, and bleeds and intracranial injuries such as cerebral hemorrhages and edema, white matter necrosis, diffuse axonal injury, and chronic traumatic encephalopathy (Chester & Alexander, 2018; Fasano & Galluccio, 2018).

Intracranial complications can lead to cognitive dysfunctions such as impaired memory and attention, difficulties in managing emotions that manifest as increased irritability, impulsivity, aggression, and depressed mood (Chester & Alexander, 2018). When cognitive functions are impaired, psychiatric treatment can be delayed and lose effectiveness as the patient cannot make necessary connections between behaviors and consequences (Chester & Alexander, 2018). A history of NSSI increases the likelihood of substance abuse, risky sexual behaviors, eating disorders, and suicide attempts (Cipriano et al., 2017; Monto et al., 2018). It is unclear how these complications are affected by the frequency or severity of head banging such as in those who engage in repetitive head banging (Keough et al., 2020).

There is a lack of focus on assessment for TBIs (Chester & Alexander, 2018) despite the finding that 75% of TBIs are concussions or mild TBIs (mTBIs) (Najerm et al., 2018). Clinical practice guidelines for diagnosis and treatment of mTBIs in children emphasize the use of assessment for diagnosis instead of imaging (Croke, 2019). Other options that aid in assessment include gathering a thorough history for risk factors, symptom rating scales, and physical exam, which is important to use for a baseline measurement, assessment after injury, and monitoring during recovery. While gathering history, it is important to pay attention to a history of previous concussions and head banging behaviors (Keough et al., 2020) as these can contribute to treatment plans. Recommendations for the physical exam are: strong recommendation for an ocular test for nystagmus, extraocular movements, saccades, smooth pursuits, and convergence and accommodation; balance exam for gait; medium recommendation for orthostatic blood pressures if dizziness present; mild recommendation for in-depth physical that includes a fundoscopy and neurological exam for other clinical concerns (Matuszak et al., 2018; Putman & Zysk, 2019; Scorza & Cole, 2019).

The vestibular ocular motor screening (VOMS) tool is used after head injuries to elicit symptoms that are common with concussions (Yorke et al., 2017). It has a high internal consistency for ages 9-19, with a Cronbach alpha between 0.92-0.97 (Moran et al., 2018). During the assessment, patients are asked whether they are experiencing symptoms of headaches, dizziness, nausea, or fogginess on a 11-point Likert rating scale. A positive score is 2 or more symptoms on any VOMS subscale and/or 5 or greater measurement on near point of convergence (NPC) distance.

There is no preferred symptom scale, but the chosen scale needs to be age appropriate. The Acute Symptom Evaluation (ACE) has a moderate to high internal consistency and Cronbach α of 0.82 and includes a component that screens for risk factors for prolonged recovery (Gioia et al., 2008). The Sport Concussion Assessment Tool 5th edition (SCAT5) is a validated commonly used tool with two versions, one for those 5-12 years old and one for those above 13 years old (Gulineau-Morel et al., 2019; Scorza & Cole, 2019). While this 22-item assessment has high validity and reliability, with a Cronbach α of 0.94, shorter versions that consist of 3 to 14 items are sufficiently reliable and valid with Cronbach α values between 0.90 to 0.94 (Wilmoth et al., 2020).

Clinical decision aids such as the PECARN Pediatric Head Injury/Trauma Algorithm and Return to Play, Activity, and Learning protocols guide management and recovery plans (Croke, 2019; Gulineau-Morel et al., 2019). PECARN is designed for pediatrics and is validated for screening low and high risk children with TBIs (Nakhjavan-Shahraki et al., 2017). Validated scales used for assessment can be used to track recovery and monitor for any changes (Gulineau-Morel et al., 2019; Lumba-Brown et al., 2018). The time for complete recovery is unknown, but the average length of time for symptom resolution is between 3-4 weeks (Halstead, 2018;

McAvoy et al., 2020). Brief cognitive rest for the first 1-2 days with a subsequent gradual return to activity helps prevents prolonged recovery (Halstead et al., 2018; Halstead, 2018; McAvoy et al., 2020).

A limitation of the guidelines and recommendations for concussions is they were based on sports concussions and emergency room visits (Gulineau-Morel et al., 2019; Putman & Zysk, 2019). They may not be applicable for inpatient pediatric psychiatric populations. There is a lack of information in regards to management and prevention of head banging, though there is some promise in making the environment more supportive, targeting functions behind head banging through dialectical or cognitive behavioral therapy (DBT/CBT) or medications, and harm minimization (Chester & Alexander, 2018; Timberlake et al., 2020).

Rationale

The Institute for Healthcare Improvement developed the Model of Improvement for establishing aims, measures, and changes in an organization. It incorporates the use of the Plan-Do-Study-Act (PDSA) cycles for testing the identified changes. This model is ideal for small scale quality improvement projects because it allows for quick identification of problems, implementation of small changes and measuring the effectiveness of those changes (Health Resources and Service Administration [HRSA], 2011).

Subacute currently has a concussion protocol, but it primarily focuses on management of head injuries. After identifying the aims, measures, and interventions, the PDSA cycle allows for assessment of issues with the interventions and can track any adjustments made to correct for those issues. In a short period, multiple PDSA cycles can be utilized to refine the intervention.

Specific Aims

1. By January 2022, 90% of children between ages 5-17 who are admitted to Subacute will receive a standardized concussion assessment within 24 hours of intake.
2. By January 2022, 80% of children between ages 5-17 who have sustained head injuries will receive a follow-up assessment 24 hours after time of injury.
3. By January 2022, 80% of psychiatric technicians who are working at Subacute will demonstrate increased knowledge of the standardized protocol which will be assessed with a pre- and post- education session evaluation.

Methods

Context

This project was conducted in a 24-bed, short-term, residential inpatient psychiatric facility in the Pacific Northwest from September 18, 2021 to December 31, 2021. This program provides children and teens ages 5-17 with family and individual therapy, medication management, and skills building. In 2021, 214 children were admitted to the program with an average length of stay of 24 days per patient. Common psychiatric diagnoses of this patient population include but are not limited to attention deficit hyperactivity disorder (ADHD), major depressive disorder (MDD), generalized anxiety disorder (GAD), disruptive mood dysregulation disorder (DMDD), schizophrenia, bipolar disorder, and post traumatic stress disorder (PTSD). Many of these diagnoses present with emotional dysregulation and subsequent self harm behaviors. The most common manifestation of self-injurious behaviors is superficial cutting of parts of one's body, but these behaviors can also present as head banging, which can lead to TBIs depending on severity and frequency of the action. However, head banging is not the only way that can lead to head injuries. Playing, exercising, sports, and falls is also another way that can result in TBIs.

According to the original protocol, all patients admitted to this facility should receive a neurologic assessment within 24 hours of admission in order to assess their baseline status prior to any injuries. An order for "concussion protocol" is placed in the patient's electronic health record (EHR) when an incident was determined to be a head injury and the patient is at risk for a mTBI. Depending on the findings during the assessment, there are three stages to classify patients. Stage 1 is the most restrictive in terms of activity and stage 3 is the least restrictive. The stage that a patient is identified as depends on the severity of symptoms. Follow up assessments were conducted 2 hours, 8 hours, 24 hours, 36 hours, and 48 hours after injury to determine if there should be any changes in the stage. The psychiatric technicians spend the most time with the patients and informally receive education regarding protocols, but there is no standard for training psychiatric technicians on protocols. There is also a high turnover rate among psychiatric technicians, so leadership is looking into how to standardize the delivery of education sessions.

Interventions

The primary intervention for this project was the development and implementation of an evidence-based standard head injury protocol that encompasses updated evidence-based recommendations for assessment and management of head injuries thus potentially reducing the risk of complications (see Appendix B). The assessment portion of the standardized head injury protocol consists of the SCAT5 symptom scale and VOMS. Assessments were conducted and recorded in the patient's EHR within 24 hours of intake/admission, within 30 minutes of injury, and 24 hours after injury. To address the barrier of patient refusals, the baseline assessment was incorporated into the intake assessment. To ensure that the head injury assessments did not disrupt workflow, a SmartPhrase in the EHR was created and incorporated into the existent

intake note. The management portion and whether an order for "concussion protocol" needs to be placed in the EHR were based on the assessment post-injury. If the patient met criteria for high risk of mTBI, nursing placed an order for "concussion protocol" and initiated a limitation of activities. Patients then received follow up assessments every 24 hours with a gradual return to activities. A SmartPhrase was also created for follow-up assessment notes. The entire protocol, written in a Word document, was uploaded into a folder containing facility protocols on a shared computer drive, accessible to all staff that work at the facility.

The nurses were informed and taught about the updated protocol and standardized head injury assessment during a nursing meeting. The psychiatric technicians received education on the updated head injury protocol through a 15 to 20-minute educational session consisting of a PowerPoint taught face-to-face. The presentation consisted of case-based scenarios with both hypothetical and real-life examples unique to the facility, and promoted active learning in participants through encouragement of analytical thinking and participation in case study discussion. A pre- and post-education evaluation was administered to determine effectiveness of the education session (see Appendix C).

Study of Intervention(s)

The study of the impact of the intervention included semi-structured interviews with psychiatric technicians and nurses in order to adjust the protocol and educational presentation as needed. Psychiatric technicians and nurses were queried regarding the original and updated protocol in an attempt to determine if the updated protocol provided improved clarity and decreased miscommunication. Concurrent chart review revealed trends, patterns, and previously undetected barriers.

Measures

The outcome measures for this project are the number of baseline and 24 hour follow up assessments completed and the psychiatric technicians' gain scores from the pre- and post-education evaluations. Process measures include the number of children admitted and need a baseline assessment during intake, the number of children who need a follow-up assessment after a head injury and the number of psychiatric technicians who attend the education session and complete the evaluations. A balancing measure is the percentage of daily tasks completed to ensure the protocol does not disrupt current workflow and cause more work for nursing and the psychiatric technicians.

Analysis

During the implementation period, collected data for assessment completion rates was analyzed weekly, documented in tables, and displayed through run charts for the nurses and the medical director. The changes in number of assessments needed and completed for each patient was calculated in absolute numberers and percentages. Factors such as barriers to why assessments were not completed within the observed week were taken into account when considering what changes to make for the next PDSA cycle. Once the project's observation period was over, an equal variance *t*-test was performed to compare the means of pre- and post-intervention completion rates. Due to certain weeks without data, tables and run charts were displayed as monthly absolute numbers and percentages.

Once education for psychiatric technicians and pre- and post-session evaluations were completed, scores were calculated in absolute numbers and a paired *t*-test was performed to compare the scores of the pre- and post-evaluations. Gain scores were calculated from pre- and post-evaluation scores to indicate whether scores increased, decreased, or did not change. Further statistical analyses were performed between gain scores and demographic information collected

to determine any third variables. A one-way between subjects ANOVA was conducted to compare the effect of shift times on gain scores for education and evaluations given during end of morning, beginning of swing, and beginning of night shifts conditions. Statistical tests to calculate *p*-values were performed to compare both gain scores versus years of work experience and gain scores versus education level. Analyzed data were displayed in a table and bar chart.

Ethical Considerations

Patients at Subacute were informed of the protocol and the reason why a head injury assessment was being conducted. Patient information was de-identified and stored on an encrypted device. All the staff at Subacute were informed of the project during group meetings and through electronic communication. Psychiatric technicians' participation in the pre- and post-education session evaluations was voluntary. The evaluations were de-identified and does not involve patient data. Responses were stored on an encrypted device. The participating site gave consent to the project by signing a letter of support (see Appendix D). This project was submitted to the Oregon Health and Science Investigational Review Board (Study #00023251) and was deemed to not be human research (see Appendix E). Appendix F is an outline of the project timeline.

Results

Three months of pre-intervention data ($n = 45$) was compared to three months of post-intervention data ($n = 43$). Table 2 lists characteristics between the two groups, which shows similar demographic information in terms of age, length of stay, causes of and severity of head injuries, and number of children admitted who displayed head banging self-injurious behaviors. The biggest difference between the two groups is the absolute count of incidents of head injuries with 37 in the pre-intervention period and 82 in the post-intervention period. The greatest

contributor to this difference is the absolute number of injuries due to head banging behaviors, with an increase from 33 pre-intervention to 77 post-intervention despite the percentages remaining similar, 89.19% versus 93.90% respectively.

Over the course of this project, baseline assessment completion rates did increase (see Table 3 and Figure 1), but the increase did not prove to be significant ($p = .100$). The follow-up assessment completion rates also increased (see Table 4 and Figure 2) and this was a significant increase ($p = .044$).

A barrier to follow-up assessment completion rates identified during the first PDSA cycle, which did not exist in the pre-intervention period, was the lack of communication and reporting of injuries from psychiatric technicians to nursing staff. Reasons for this include subjective definition of "head injury" and "injury" in general and lack of knowledge of facility's reporting guidelines for injuries due to high staff turnover rate among psychiatric technicians and nurses. The second PDSA cycle consisting of an education session on injury reporting guidelines was conducted to further increase follow-up assessment completion rates. As seen in Figure 2, there was increase following the second education session from 62.50% at the end of PDSA-1 to 87.50% at the end of PDSA-2. Out of the eight needed assessments, the one assessment not completed was due to lack of reporting. The significance of the increase in completion rates could not be calculated due to only having one week's worth of data in December due to a COVID-19 positive status among staff, which resulted in a temporary halt in intakes and subsequent decreasing patient census.

Prior to implementation of the updated protocol, 42 psychiatric technicians attended an education session delivered across two days in October 1-2 and all participated in a pre- and post-session evaluation. Figure 3 shows that gain scores included positive changes, no changes,

and negative changes, with 66.67% demonstrating a positive increase in scores. Figure 4 illustrates the number of correct answers per question, and shows that the psychiatric technicians, as an entire group, scored higher in the post-education evaluation, an increase that proved to be significant ($p < .001$). An unforeseen barrier of the pre- and post-session evaluation was the necessity of a smartphone to scan the provided barcode and take the evaluation since the it was only accessible electronically. One psychiatric technician only owned a mobile phone, but a compatible device was provided to complete the evaluation. All the psychiatric technicians who attended the sessions completed the evaluations and there were no other barriers to participation.

There was no third variable found to be affecting gain scores (see Table 5 for psychiatric technician demographics and statistical analyses). There was no significant correlation between gain scores and shift groups ($p = .297$), total months of work experience ($p = .951$), months of work experience only in the facility ($p = .804$), or education level ($p = .054$).

Discussions

Summary

The implementation of an evidence-based head injury protocol was effective in increasing in both baseline and follow-up assessment completion rates. Baseline assessments increased from 68.89% pre-intervention to 93.02% post-intervention, although this was not a significant increase, the aim of the project to reach at least 90% baseline completion rate was achieved. On the other hand, follow-up assessment completion rates significantly increased from 30.30% pre-intervention to 67.53% post-intervention, however they did not reach the aim of 80% completion rate. Despite being unable to assess the full extent of how effective the second PDSA cycle was on completion rates due to lack of data, there was an increase when comparing rates before and after the cycle started.

An education session on the updated protocol was effective in increasing psychiatric technicians' gain scores. Although the aim was not met, with only 66.67% positive gain scores, the overall increase in post-education scores among psychiatric technicians was significant. An analysis between demographic data and gain scores did not demonstrate any correlation.

An unexpected result found amongst the data was the increase in the number of head injurious incidents from 37 pre-intervention to 82 post-intervention. The acuity of the children admitted in both groups are approximately similar with one less child admitted with head banging behaviors post-intervention when compared to pre-intervention. An explanation could be the post-intervention group was slightly more acute, with longer lengths of stays and increased severity of head banging behaviors. Another possible explanation is that the updated protocol and education session increased awareness of head banging behaviors among the staff, which increased documentation and assessments of incidents. There could have been an implication that all head banging results in a head injury and should be managed as such.

Some contextual changes were made to the protocol to prior to the implementation of the updated protocol, which could have affected the outcomes. Incorporating the baseline assessment into the intake assessment could have increased patient compliance due to the child entering a new environment. It has been noted that children are less likely to refuse the intake assessment versus the next day, 24 hour nursing assessment, which when the baseline assessment was usually conducted per the previous protocol. The creation of the SmartPhrase in the EHR to allow for ease of note writing could have also contributed to increased completion rates in that an automatic embedment into an existing note template could have made it easier to remember to conduct the assessment. The visibility of weekly run charts for the nurses could have also provided motivation and reminders to continue to conduct assessments.

This project was implemented during the COVID-19 pandemic and the facility had protocols in place if a patient of staff tested positive for COVID-19 in the building. These protocols include a temporary halt in intakes and facility wide testing of all staff and patients who had come in contact with COVID-19 positive individual. It usually takes two weeks before the program is given permission to start admitting new patients again. During this period, the census decreases because patients are still being discharged, which decreases the number of psychiatric technicians needed in the building to work. This can result in resignations and further staff shortage, which further decreases patient census and acuity. This situation happened three times during the pre-intervention and post-intervention period for this project. A lower patient census, lower patient acuity, and weeks without intakes resulted in some weeks without data. However, even with lower patient census and acuity, the sample population in the pre-intervention period is similar to that in the post-intervention period. Patient acuity can be inferred from characteristics of children with self-injurious head banging behaviors. Leadership is aware of this and is constantly working on hiring to fill open positions.

Based on the literature search, this project is the first to develop a head injury assessment tool, incorporate it into a facility-wide protocol for head injuries, and implement the protocol for a pediatric mental health population. It also provides information on the characteristics of self-injurious head banging in this population, which could supplement future projects.

Interpretation

An evidence-based head injury standard protocol was effective in increasing adherence to the protocol as evidenced by an increase in both baseline and follow-up assessment completion rates. Evidence-based practice (EBP) incorporates the best available research results into clinical practice. It standardizes care based on current evidence and improves patient outcomes (Abu-

Baker et al., 2021). However, one of the biggest barriers to its theoretical success in actual clinical practice is implementation and adherence. The results of the updated head injury protocol at Subacute demonstrates increased adherence and suggests a successful implementation into the program. The protocol standardizes how assessment exams are conducted and the frequency of assessments, which contributes to prevention, early diagnosis, and appropriate management, which all function to decrease complications of head injuries. The results of this protocol are consistent with strengths noted by what Kendall and Frank (2017) term "evidence-based treatment protocols." Among the strengths they discuss, they also note that these protocols can better facilitate uniform training among staff, by simply having details in a written form.

The use of a face-to face brief education session as an active learning teaching style with case-based scenarios was effective in increasing psychiatric technicians' knowledge. This finding is consistent with prior studies on the effect on similar types of education on knowledge. Shigli et al. (2016) found that PowerPoint presentations were effective as a teaching tool to deliver information and increase knowledge in students. Although Bock et al. (2021) did not find any difference between face-to-face learning versus e-learning in teaching theoretical knowledge, results do indicate that both methods did increase knowledge in their respective groups. This indicates that, if necessary to reach more psychiatric technicians in future protocol iterations, an e-learning option would may be as effective as face-to-face learning. However, for knowledge that includes clinical skills, a blended e-learning and face-to-face method is best. Because Subacute is unique in how the program is structured, the patient population it serves, and subsequent special situations that occur, the presentation had to adopt a mixed traditional lecture and case-based learning (CBL) style. Case-based learning (CBL) has been shown to be an effective type of active learning that improves participants' knowledge (Schoonover et al., 2019).

The cost of developing and a standard assessment tool and implementing it as part of an updated protocol is that it does take time to teach the nurses and psychiatric technicians. It also requires the nurses to assess and document every possible head injury incident that happens since they need to determine the presence of an actual injury and whether a follow-up assessment is required. Despite the extra time needed, the updated protocol does not appear to have disrupted work flow. It is noted that the beginning of the post-intervention period was coincidentally timed with the arrival and training of a group of travel nurses, who stayed throughout the data collection period, which may have also affected adherence and barriers observed.

The disadvantage of having a new group of nurses, in addition to the constant turnover of psychiatric technicians, was an increase in lack of communication caused by tension between the two groups. An outcome of this conflict was the change in primary barriers to assessment completion rates. Though the barriers of refusals and lack of nurses in the building was addressed with a change in the timing of assessments and onboarding travel nurses respectively, the rates of psychiatric technicians not notifying nursing about head injurious incidents and documentation inconsistency increased. This change could be due to other barriers having been successfully addressed, but it also be due to more systematic issues with communication between disciplines and unclear guidelines about what constitutes an injury and what needs to be reported and assessed by nursing.

Limitations

The number of participants for this project was limited to one subacute pediatric mental health facility in the Pacific Northwest. The participant size was small, made even more so in the context of COVID-19 and staff shortage among psychiatric technicians and nurses. The protocol was developed with this specific patient population in mind and the unique situations that the

patients and staff can be in, which makes the findings not very generalizable to other populations or facilities. However, the protocol has been easily adjusted throughout the implementation period, so it may be possible to adapt the protocol to larger populations such as an inpatient pediatric psychiatric hospitals or less acute group homes serving pediatrics with mental health conditions.

Because there was no standard for training the psychiatric technicians on protocols and the varied shifts work, it was difficult to organize education sessions throughout the implementation period. Due to this, the education session was only delivered across two days during a weekend just prior to the implementation of the updated protocol. The reasoning behind a weekend education session was Saturday and Sunday marked a switch in the week between the two main groups of psychiatric technicians, so these two days should reach the majority of the full-time psychiatric technicians. Unfortunately, the education sessions were not able to reach on-call or new staff hired afterward. In addition, the existence of bias was high given that the sessions were delivered face-to-face and encouraged real-time feedback and discussion, which contributed to minor adjustments to both the PowerPoint and oral presentations as sessions were given throughout the two days.

Conclusions

The results of this quality improvement project demonstrates that the implementation of an evidence-based protocol can be successful in reducing the risk of complications and improve outcomes. Future attempts to develop quality improvements on facility protocols may be equally as successful. This project also revealed a persistent barrier to completion rates of both baseline and follow-up assessments – inconsistent documentation or the lack of it among nursing. While this project only delved into its effects on head injury assessments, there is adequate concern that

effects are further reaching. Currently, at this facility, shift notes are required to be done by psychiatric technicians. Nurses can decide if a patient care activity performed is significant enough to require a nursing progress note, but nurses do not have to write a shift note due the nurse-to-patient ratio, which can be as high as 1:24 with a full census. Documentation is important for patient safety, which is important for not just members of the patient's care team, but also for accreditation and auditing commissions. Further research is needed to determine possible root causes. A proposed next step to address this is developing and implementing standard nursing shift notes.

Education sessions proved to be an efficient way to inform staff of new information as shown by the use of it for both PDSA cycles. It is a tool to consider using for future need to spread and teach information. An issue that arose while attempting to deliver education sessions for the updated protocol was the lack of a standard training or education process for psychiatric technicians. Currently, when protocols are made or updated, psychiatric technicians are given an informal announcement with brief information. When a patient is on the protocol, the psychiatric technicians caring for the patient are expected to look up the protocol on the shared facility database where all protocols are uploaded and kept. A proposed next step to address this is the development of a standard training or education process of the protocols for the psychiatric technicians, which would be part of their onboarding process.

This quality improvement project revealed the effectiveness of evidence-based protocols and education sessions in a pediatric mental health facility. The adaptability of the protocol to unforeseen outcomes and barriers has future implications in its possible ability to expand to bigger populations outside of the sample population in this project. The reveal of a potential systemic issue has increased awareness, with development in progress to address it.

References

Abu-Baker, N.N., AbuAlrub, S., Obeidat, R.F., & Assmairan, K. (2021). Evidence-based practice beliefs and implementations: A cross-sectional study among undergraduate nursing students. *BMC Nursing, 20*(13), 1-8. https://doi.org/10.1186/s12912-020-00522-x

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed). American Psychiatric Publishing.

Bock, A., Kniha, K., Goloborodko, E., Lemos, M., Rittich, A.B., Mohlhenrich, S.C., Rafai, N., Holzle, F., & Modabber, A. (2021). Effectiveness of face-to-face, blended and e-learning in teaching the application of local anesthesia: A randomized study. *BMC Medical Education, 21*(137), 1-8. https://doi.org/10.1186/s12909-021-02569-z

Buttaravoli, P. & Leffler, S.M. (2012). *Minor emergencies* (3rd ed). Saunders. https://doi.org/10.1016/B978-0-323-07909-9.00010-6

Chester, V. & Alexander, R.T. (2018). Head banging as a form of self-harm among inpatients within forensic mental health and intellectual disability services. *The Journal of Forensic Psychiatry & Psychology, 29(*4), 557-573. https://doi.org/10.1016/j.eurpsy.2017.01.883

Cipriano, A., Cella, S., & Cotrufo, P. (2017). Nonsuicidal self-injury: A systematic review. *Frontiers in Psychology, 8*(1946), 1-14. https://doi.org/10.3389/fpsyg.2017.01946

Croke, L. (2019). Mild TBI in children: Guidance from the CDC for diagnosis and treatment. *American Family Physician, 99*(7), 462-464.

Fasano, A. & Galluccio, V. (2018). Brain injury due to head banging in Tourette. *Parkinsonism and Related Disorders, 49*, 114-115. https://doi.org/10.1016/j.parkreldis.2018.01.011

Gioia, G.A., Collins, M., & Isquith, P.K. (2008). Improving identification and diagnosis of mild traumatic brain injury with evidence: Psychometric support for the acute concussion

evaluation. *Journal of Head Trauma Rehabilitation, 23*(4), 230-242. DOI: 10.1097/01.HTR.0000327255.38881.ca

Gulineau-Morel, R.N., Zinkus, T.P., & Pichon, J.L. (2019). Pediatric head trauma: A review and update. *Pediatrics in Review, 40*(9), 468-481. https://doi.org/10.1542/pir.2018-0257

Gwyther, A.R.M., Walters, A.S., & Hill, C.M. (2017). Rhythmic movement disorder in childhood: An integrative review. *Sleep Medicine Reviews, 35*, 62-75. https://doi.org/10.1016/j.smrv.2016.08.003

Halstead, M.E. (2018). Return to learn. In B. Hainline & R.A. Stern (Eds.), *Handbook of Clinical Neurology* (Vol. 158., pp. 199-204). Elsevier. https://doi.org/10.1016/B978-0-444-63954-7.00020-3

Halstead, M.E., Walter, K.D., Moffat, K., & Council on Sports Medicine and Fitness. (2018). Sport-related concussion in children and adolescents. *Pediatrics, 142*(6), 1-24. https://doi-org.liboff.ohsu.edu/10.1542/peds.2018-3074

Health Resources and Services Administration. (2011). *Quality improvemen*t. U.S. Department of Health and Human Services. https://www.hrsa.gov/sites/default/files/quality/toolbox/508pdfs/qualityimprovement.pdf

Kendall, P.C. & Frank, H.E. (2017). Implementing evidence-based treatment protocols: Flexibility within fidelity. *Clinical Psychology Science and Practice, 25*(4), e12271. https://doi.org/10.1111/cpsp.12271

Keough, L., Gardner, S., & Kirby, A. (2020). Development and implementation of a brain rest protocol in nonintellectually challenged youth with head-banging behaviors. *Journal of the American Psychiatric Nurses Association, 26*(3), 282-287. https://doi.org/10.1177/1078390319897988

Kukielka, E. (2020). An analysis of nonsuicidal self-injury among children and adolescents in inpatient psychiatric hospitals and units in Pennsylvania. *Patient Safety, 2*(3), 30-41. https://doi.org/10.33940/data/2020.9.3

Lumba-Brown, A., Yeates, K.O., Sarmiento, K., Breiding, M.J., Haegerich, T.M., Gioia, G.A., Turner, M., Benzel, E.C., Suskauer, S.J., Giza, C.C., Joseph, M., Broomand, C., Weissman, B., Gordon, W., Wright, D.W., Moser, R.S., McAvoy, K., Ewing-Cobbs, L., Duhaime, A., … Timmons, S.D. (2018). Centers for disease control and prevention guideline on the diagnosis and management of mild traumatic brain injury among children. *JAMA Pediatrics, 172*(11), 1-30. DOI: 10.1001/jamapediatrics.2018.2853

Matuszak, J.M., McVige, J., McPherson, J., Willer, B., & Leddy, J. (2018). A practical concussion physical examination toolbox: Evidence-based physical examination for concussion. *Sports Health, 8*(3), 260-269. https://doi.org/10.1177/1941738116641394

McAvoy, K., Eagan-Johnson, B., Dymacek, R., Hooper, S., McCart, M., & Tyler, J. (2020). Establishing consensus for essential elements in returning to learn following a concussion. *Journal of School Health, 90*(11), 849-858. https://doi-org.liboff.ohsu.edu/10.1111/josh.12949

Monto, M.A., McRee, N., & Deryck, F.S. (2018). Nonsuicidal self-injury among a representative sample of US adolescents, 2015. *AJPH, 108*(8). 1042-1048. https://doi.org/10.2105/AJPH.2018.304470

Moran, R.N., Covassin, T., Elbin, R.J., Gould, D., & Nogle, S. (2018). Reliability and normative reference values for the vestibular/ocular motor screening (VOMS) tool in youth athletes. *The American Journal of Sports Medicine, 46*(6), 1475-1480. https://doi-org.liboff.ohsu.edu/10.1177/0363546518756979

Najerm, D., Rennie, K., Ribecco-Lutkiewicz, M., Ly, D., Haukenfrers, J., Liu, Q., Nzau, M., Fraser, D.D., & Bani-Yaghoub, M. (2018). Traumatic brain injury: classification, models, and markers. *Biochemistry and Cell Biology, 96*(4), 391-406. https://doi.org/10.1139/bcb-2016-0160

Nakhjavan-Shahraki, B., Yousefifard, M., Hajighanbari, M.J., & Oraii, A. (2017). Pediatric emergency care applied research network (PECARN) prediction rules in identifying high risk children with mild traumatic brain injury. *European Journal of Emergency Surgery, 43*, 755-762. https://doi-org.liboff.ohsu.edu/10.1007/s00068-017-0811-9

Putman, G. & Zysk, P. (2019). *Clinical practice guidelines for management of concussion (mild traumatic brain injury) in the pediatric and adolescent patient*. Society of Pediatric Nurses. http://www.pedsnurses.org/d/do/3764

Schoonover, K., Herber, A., Heusinkvelt, S., Yadav, H., Burton, M.C. (2019). Case-based powerpoint to improve knowledge and comfort of having code status discussions by physician assistant and nurse practitioner students. *Journal of Palliative Care, 34*(4), 215-217. https://doi.org/10.1177/0825859718810725

Scorza, K.A. & Cole, W. (2019). Current concepts in concussion: Initial evaluation and management. *American Family Physician, 99*(7), 426-434.

Shigli, K., Agrawali, N., Nair, C., Sajjan, S., Kakodkar, P., & Hebbal, M. (2016). Use of powerpoint presentation as a teaching tool for undergraduate students in the subject of gerontology. *The Journal of Indian Prosthodontic Society, 16*(2), 187-192. DOI: 10.4103/0972-4052.167940

Timberlake, L.M., Beeber, L.S., & Hubbard, G. (2020). Nonsuicidal self-injury: Management on the inpatient psychiatric unit. *Journal of the American Psychiatric Nurses Association, 26*(1), 10-26. https://doi.org/10.1177/1078390319878878

Wilmoth, K., Magnus, B.E., McCrea, M.A., & Nelson, L.D. (2020). Preliminary validation of an abbreviated acute concussion symptom checklist using item response theory. *The American Journal of Sports Medicine, 48*(12), 3087-3093. https://doi-org.liboff.ohsu.edu/10.1177/0363546520953440

Yorke, A.M., Smith, L., Babcock, M., & Alsalaheen, B. (2017). Validity and reliability of the vestibular/ocular motor screening and associations with common concussion screening tools. *Sports Health, 9*(2), 174-180. https://doi.org/10.1177/1941738116678411

Table 1

Reasons why assessments were not completed in the pre-intervention and post-intervention periods

Assessment	Pre-intervention			Post-intervention		
	Reason	*n*	%	Reason	*n*	%
Baseline	Unknown, no documentation	11	78.57	Unknown, no documentation	2	100.00
	Patient refused	3	21.43			
Total		14			2	
Follow-up	Nursing not notified	10	43.48	Nursing not notified	14	56.00
	Patient refused	6	26.09	Unknown, no documentation	7	28.00
	No nurse in the building	4	17.39	Patient discharged home	3	12.00
	Unknown, no documentation	2	8.70	Patient refused	1	4.00
	Patient sent to the ED	1	4.35			
Total		23			25	

Table 2

Characteristics of children admitted between July 1 to December 31, 2021.

Characteristic	Total	Pre-intervention	Post-intervention
General			
n	88	45	43
Average age (year)	14.6	14.7	14.6
Average length of stay (day) [a]	21.2	20.7	21.7
Head injury incident			
n	119	37	82
Cause			
Self-injurious behaviors (head banging)	110 (92.44%)	33 (89.19%)	77 (93.90%)
Fell	4 (3.36%)	0 (0.00%)	4 (4.88%)
Hit by ball	5 (4.20%)	4 (10.81%)	1 (1.22%)
Children with self-injurious behaviors (head banging)			
n	21	11	10
Length of stay (day)	24.8	22.7	27.3
Severity (frequency)			
Mild (< 1 per week)	13 (61.90%)	7 (53.64%)	6 (60.00%)
Moderate (≥ 1 per week, but not daily)	6 (28.57%)	2 (18.18%)	4 (40.00%)
Severe (≥ 1 per day)	2 (9.52%)	2 (18.18%)	0 (0.00%)
Primary diagnoses [b]			

Table 2 (continued)

Major depressive disorder	14 (66.67%)	7 (63.64%)	7 (70.00%)
Generalized anxiety disorder	4 (19.05%)	3 (27.27%)	1 (10.00%)
Post-traumatic stress disorder	1 (4.76%)	0 (0.00%)	1 (10.00%)
Obsessive-compulsive disorder	1 (4.76%)	0 (0.00%)	1 (10.00%)
Attention deficit hyperactivity disorder	1 (4.76%)	1 (9.09%)	0 (0.00%)

[a] Two children were still admitted at the end of the observation period and so did not have length of stay data. [b] Diagnoses are primary working diagnoses at time of admit and do not include other psychiatric comorbidities.

Table 3

Baseline assessments completion rates

Month	Assessments Needed	Assessments Completed	Percentage of Assessments Completed
		Pre-intervention	
July	18	16	88.89
August	9	5	55.56
September	18	10	55.56
Total	45	31	68.89
		Post-intervention	
October	17	15	88.24
November	18	18	100.00
December	8	7	87.50
Total	43	40	93.02

Note. Some months had weeks without data due to COVID-19 outbreaks among staff, which resulted in temporary halts in intakes and subsequent decrease in census.

Table 4

Follow-up assessment completion rates

Month	Assessments Needed	Assessments Completed	Percentage of Assessments Completed
		Pre-intervention	
July	1	0	0.00
August	8	4	50.00
September	24	6	25.00
Total	33	10	30.30
		Post-intervention	
October	37	25	67.57
November	32	20	62.50
December	8	7	87.50
Total	77	52	67.53

Note. Some months had weeks without data due to COVID-19 outbreaks among staff, which resulted in temporary halts in intakes and subsequent decrease in census.

Table 5

Demographic characteristics of psychiatric technicians collected during education session

Characteristic		Pre-education score		Post-education score		Gain score		
	n = 42	M	SD	M	SD	M	SD	*p*
Shift								.297
Day Front	6	36.7	23.4	73.3	16.3	0.5	0.3	
Day Back	8	37.5	16.7	52.5	23.8	0.2	0.4	
Swing Front	6	53.3	27.3	66.7	27.3	0.3	0.4	
Swing Back	13	36.9	18.0	63.1	21.4	0.4	0.3	
Night Front	5	32.0	11.0	56.0	21.9	0.3	0.4	
Night Back	4	35.0	25.2	45.0	19.1	0.1	0.3	
Highest level of education								.054
Technical or occupational certificate	1	40.0	0.0	40.0	0.0	0.0	0.0	
Some college coursework completed	4	30.0	11.5	50.0	25.8	0.3	0.4	
Associate degree	3	21.3	33.5	46.7	11.5	0.1	0.2	
Bachelor degree	32	39.4	20.6	61.3	20.9	0.3	0.3	

Table 5 (continued)

Master's degree	2	50.0	14.1	100.0	0.0	1.0	0.0	
Years of work experience								
Total								.951
Less than or equal to 1	23	40.0	19.1	61.7	20.8	0.3	0.4	
Greater than 1 but less than 2	7	34.3	19.0	57.1	24.3	0.3	0.4	
Greater than or equal to 2	12	38.3	23.3	60.0	25.6	0.3	0.4	
In facility only								.804
Less than or equal to 1	18	43.3	17.1	62.2	23.7	0.3	0.4	
Greater than 1 but less than 2	8	35.0	17.7	57.5	22.5	0.3	0.3	
Greater than or equal to 2	16	35.0	23.7	60.0	21.9	0.3	0.3	
Total	42	38.6	19.9	60.5	22.3	0.3	0.4	< .001

Figure 1

Run table of baseline assessment completion rates

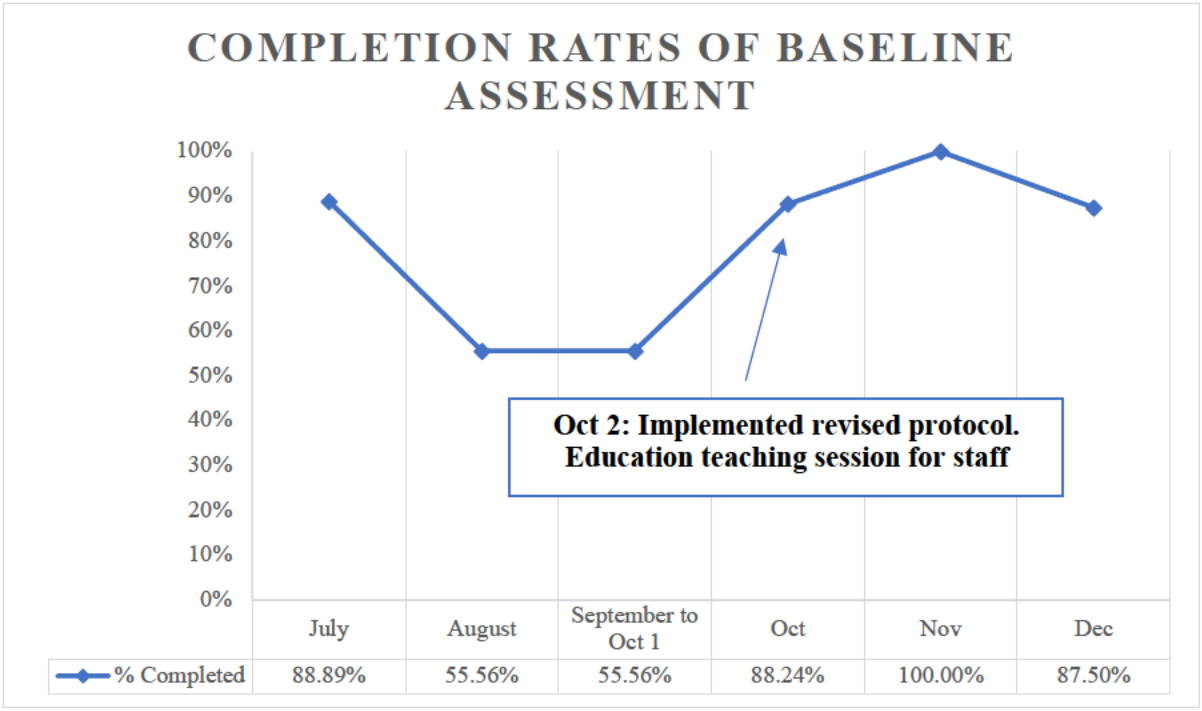


Figure 2

Run chart of follow-up assessment completion rates

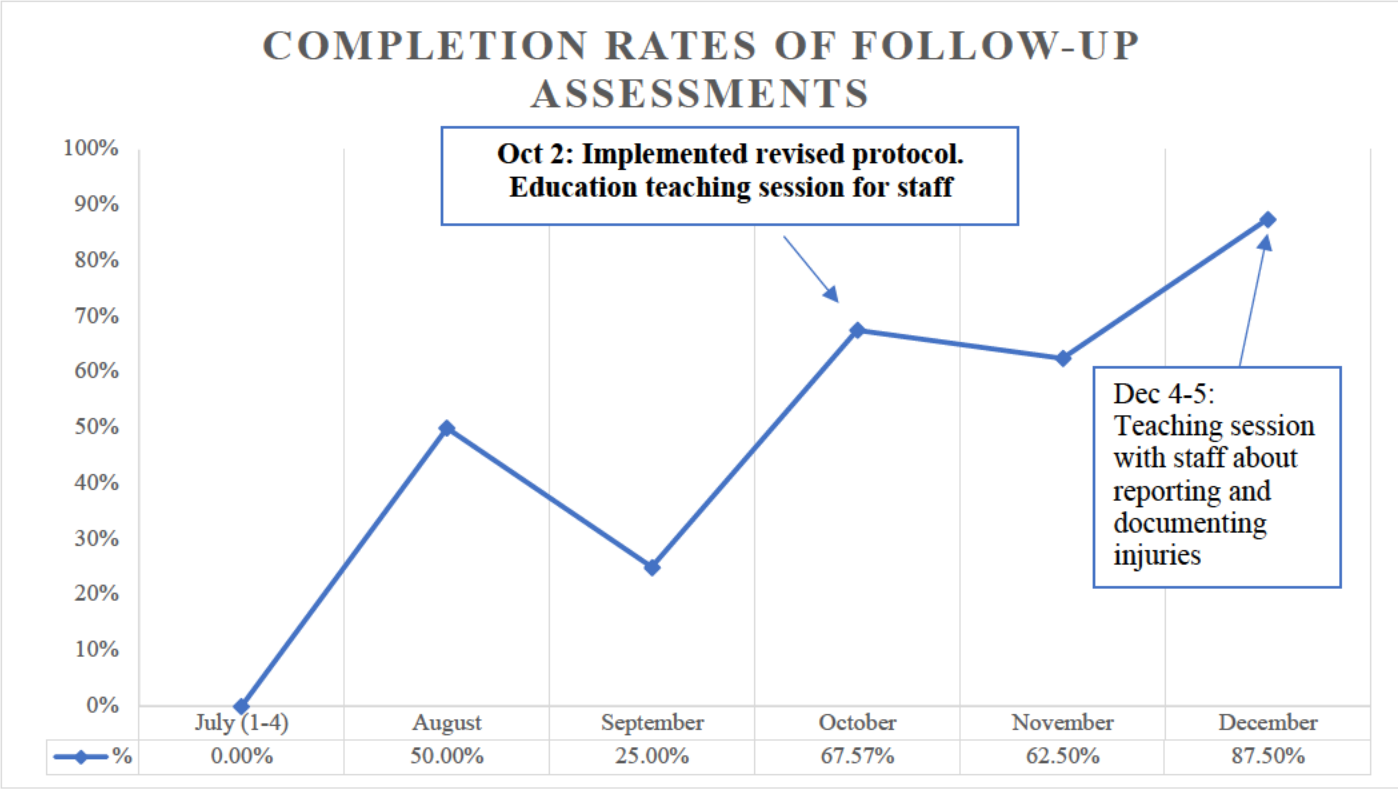
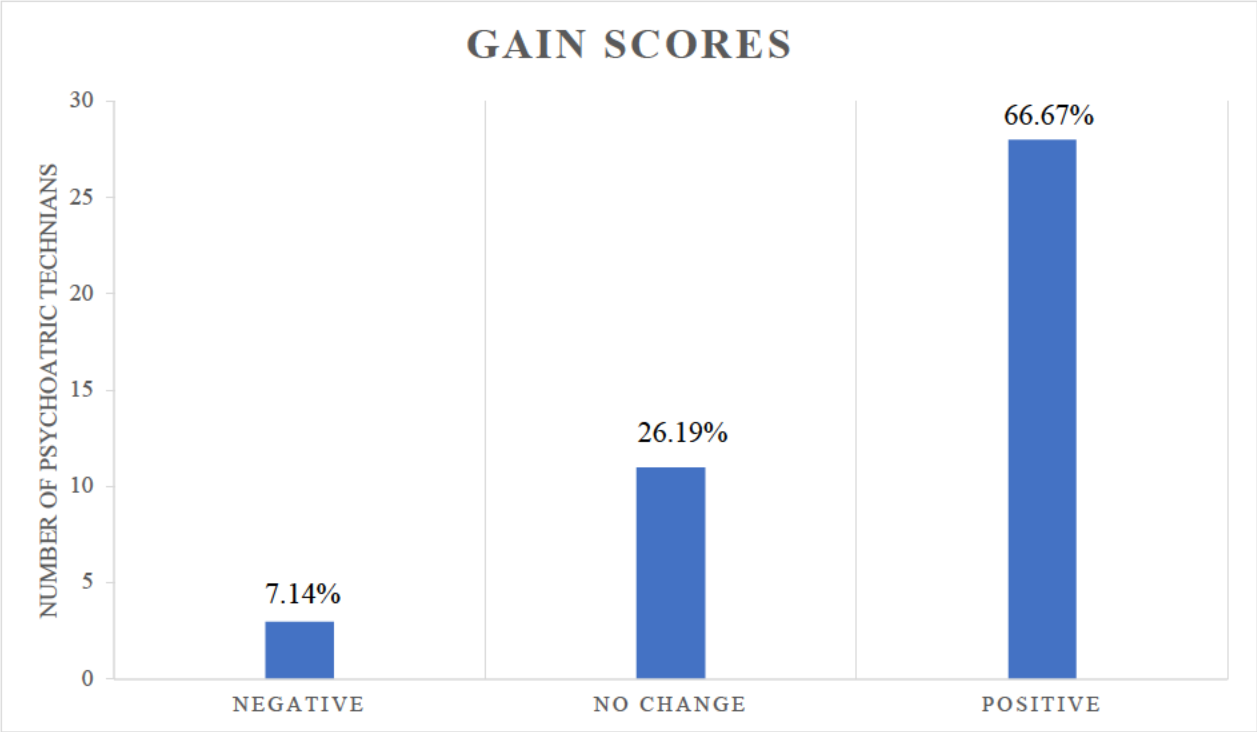


Figure 3

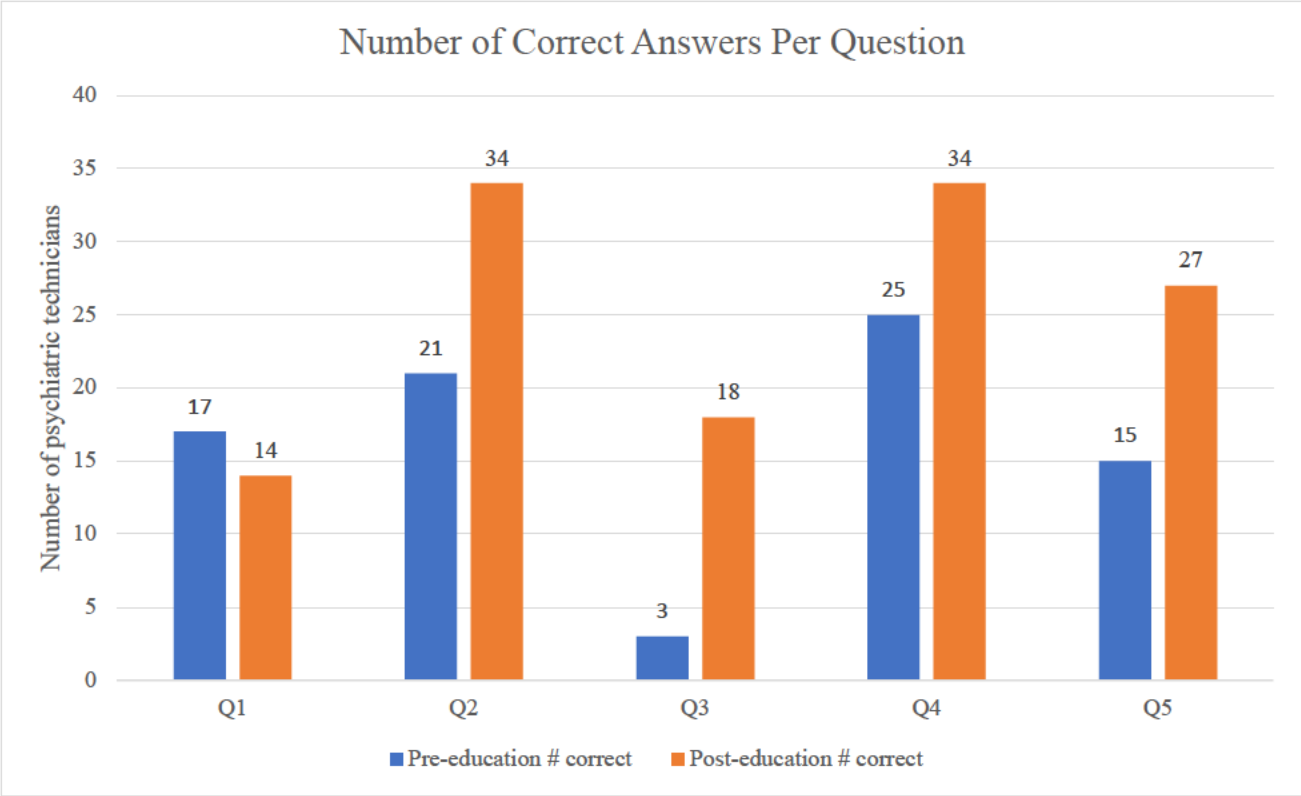
Gain scores from the psychiatric technicians' pre- and post-education session evaluations



Note. Gain scores are categorized as a negative change, no change, or positive change between pre-education and post-education scores. The y-axis is the absolute number of psychiatric technicians in those categories.

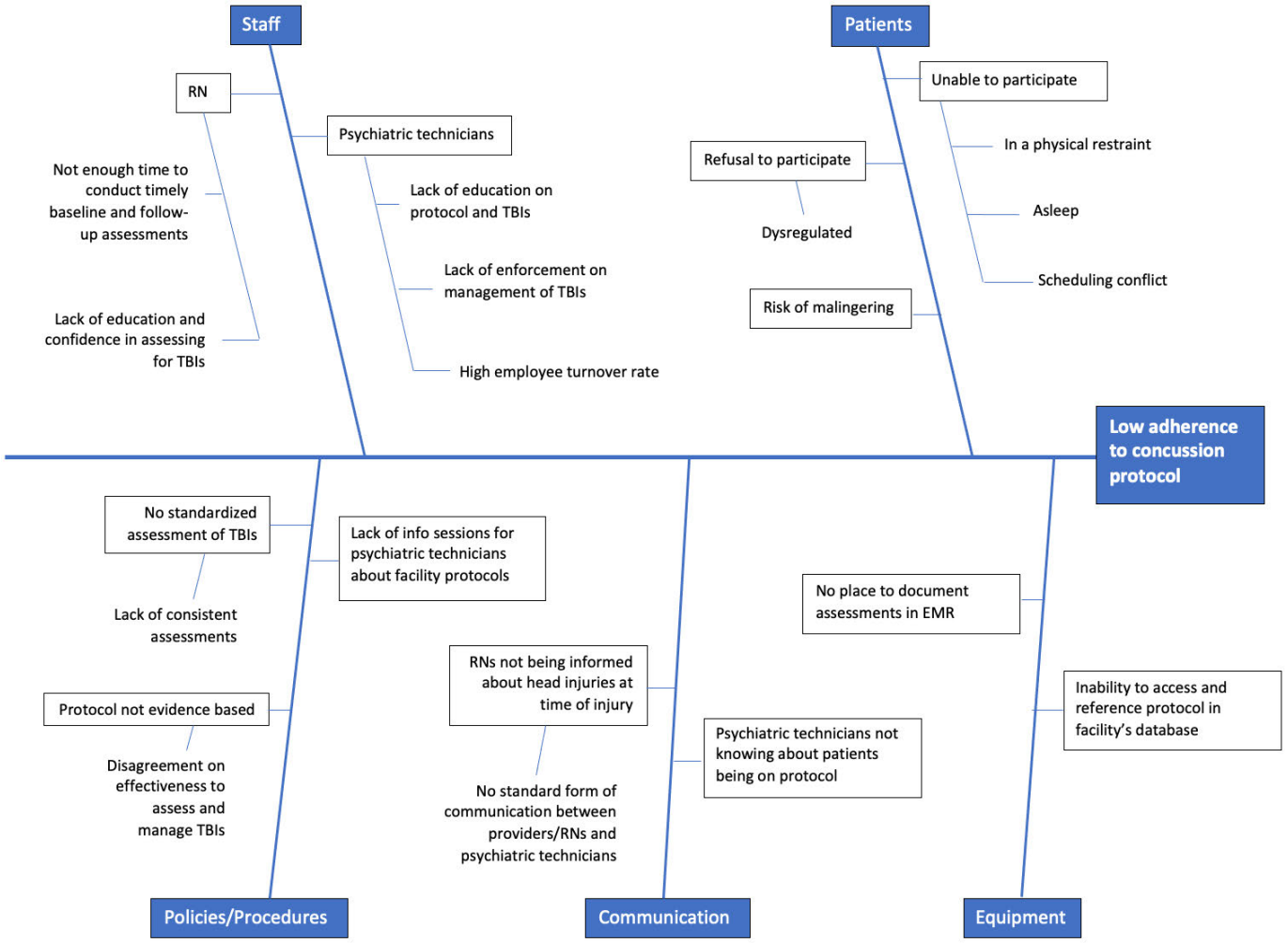
Figure 4

Number of psychiatric technicians who answered each question correctly pre-education versus post-education



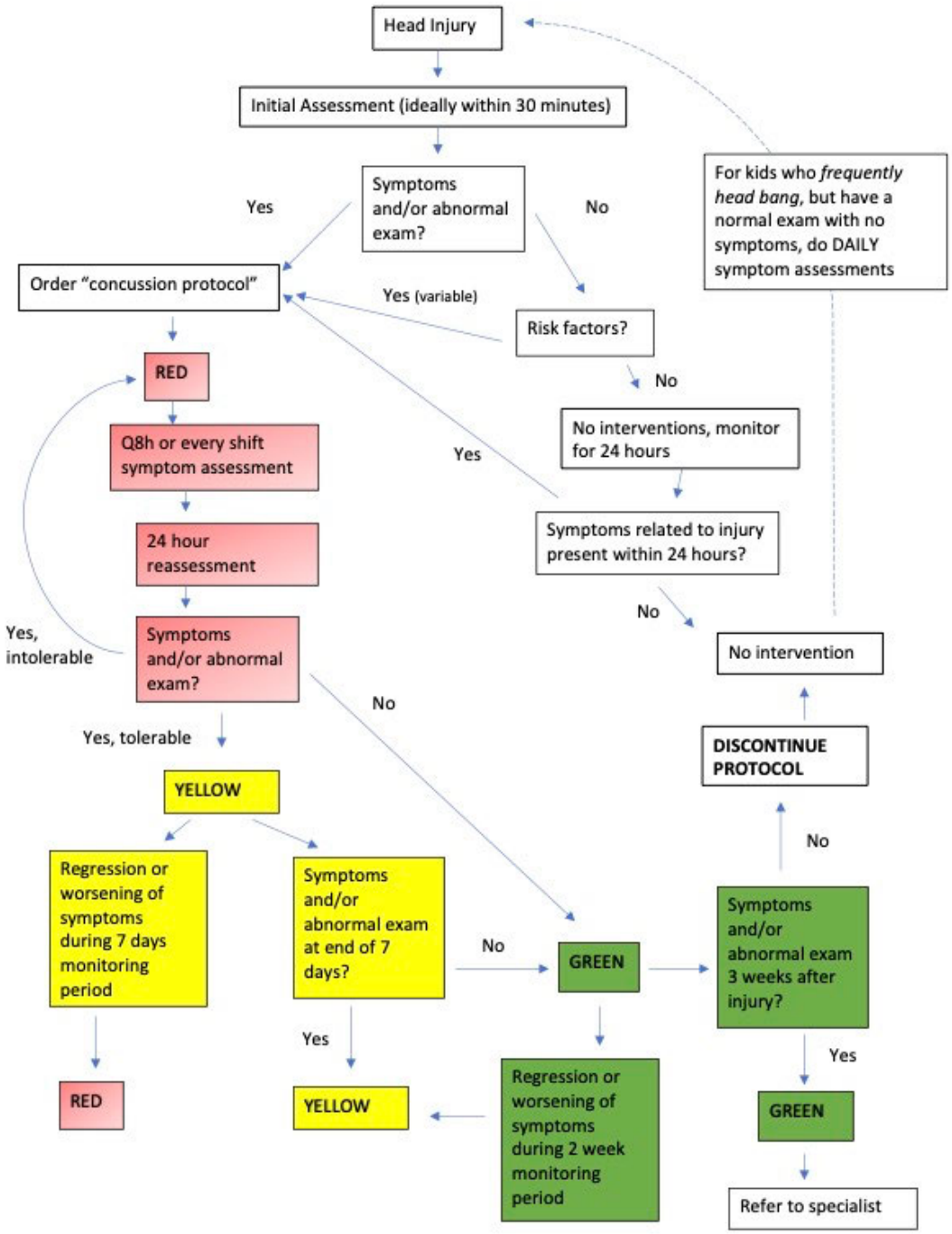
Appendix A

Cause and Effect Diagram



Appendix B

Head Injury Protocol and Assessment Tool



Risk Factors

Concussion History? Y/N	**Headache History? Y/N**	**Developmental History**	**Psychiatric History**
Previous #: 1, 2, 3, 4, 5, 6+	Prior treatment for headache?	Learning disabilities: Y/N	Anxiety: Y/N
Longest symptom duration: Days, weeks, months, years	History of migraine headache -Personal: Y/N -Family: Y/N	Attention-deficit/hyperactivity disorder: Y/N	Depression: Y/N
If multiple concussions, less force caused re-injury? Y/N			Sleep Disorder: Y/N

Sport Concussion Assessment Tool 5th edition (SCAT5) symptom scale

Symptom	Not at all/Never	A little/Rarely	Somewhat/Sometimes	A lot/Often
Difficulty concentrating	0	1	2	3
Feeling slowed down	0	1	2	3
Feeling like "in a fog"	0	1	2	3
Total # of symptoms				Out of 3
Symptom severity score				Out of 9

Vestibular ocular motor screening (VOMS)

	Completed without difficulty or symptoms?	Nystagmus?	Symptoms elicited	Symptom scale (0-10)
Extraocular muscles (EOMs)	Y/N	Y/N		
Smooth pursuit	Y/N	Y/N		
Convergence/ accomodation	Y/N	Y/N		
Vertical Saccade	Y/N	Y/N		
Horizontal Saccade	Y/N	Y/N		

Appendix C

Pre- and Post- Educational Session Evaluation

1. A child falls while spinning on the vortex. You don't think you see them hit their head or lose consciousness. They say they are fine and that nothing hurts and begin to climb back onto the vortex. What should immediately be your next action?
    A. Nothing. The child says they are fine.
    B. Stop them from going on the vortex.
    C. Call nursing to assess.
    D. Hold a conversation with the child about concussions and risks of head injuries.

2. Nursing tells you that they have put in an order for "concussion protocol." Where's the first place you should look for the child's concussion staging and activity restrictions/allowance?
    A. An inbasket in EPIC
    B. Kardex/Patient Information in EPIC
    C. Huddle board in Teams
    D. Nursing orders in EPIC

3. Three hours later after injury, the child complains of a headache. In what situation would a headache be the most worrisome?
    A. Headache that is worse while standing
    B. Headache associated with nausea and vomiting
    C. Headache while watching TV for 30 minutes
    D. Headache that child reports is 100/10 while distractedly playing cards with a peer

4. What is the average recovery time for concussions?
    A. 1-2 days
    B. 3-7 days
    C. 1-3 weeks
    D. 4-5 weeks

5. You remember that a child on your unit is on "concussion protocol," but aren't sure what exactly the child is or is not allowed to do and you do not have immediate access to a computer to check. What is the general rule of thumb?
    A. Activity as tolerated
    B. 30 minutes activity, 10 minutes break, 30 minutes activity, repeat
    C. No activities that will cause another head injury
    D. A & C
    E. All of the above

Appendix D

Clinical Site Letter of Support

Letter of Support from Clinical Agency

Date: *05/21/2021*

Dear *Helen Liu*

This letter confirms that I, *Kari Goldstein* allow *Helen Liu* (OHSU Doctor of Nursing Practice Student) access to complete his/her DNP Final Project at our clinical site. The project will take place from approximately *July 2021* to *April 2022*

This letter summarizes the core elements of the project proposal, already reviewed by the DNP Project Preceptor and clinical liaison (if applicable):

- **Project Site(s):** *Albertina Kerr Subacute: 832 NE 162nd Ave, Building F., Portland, OR 97230*
- **Project Plan: Use the following guidance to describe your project in a brief paragraph.**
  - **Identified Clinical Problem:** Patients experience head injuries which places them at risk of a concussion (mTBI). This leads to the need for an evidence-based standardized concussion toolkit and protocol in which there is more emphasis on assessing for mTBIs.
  - **Rationale:** A standardized protocol will lead to increased adherence to the assessment for mTBIs and provide clarity for psychiatric technicians on protocol content and signs and symptoms to monitor.
  - **Specific Aims:**
    1. 90% of patients will receive standardized assessment for baseline measurement within 24 hours of intake
    2. 80% of psychiatric technicians will demonstrate increased knowledge of protocol content and signs and symptoms of concussions
  - **Methods/Interventions/Measures:**
    Intervention: The assessment portion of the standardized concussion toolkit will consist of: post-concussion symptom inventory (PCSI); screening ocular exam, specifically testing EOMs, nystagmus, saccades, smooth pursuits, and convergence/accommodation; dual task gait paradigm test (steady state walking while doing serial 3s) to test gait and neurocognitive abilities. Assessments will be conducted within 24 hours of intake/admission, at the time of injury, and 30 minutes after injury. Assessments will determine if limited activities are required per concussion protocol. Once on the protocol, patients will receive follow up assessments every 24 hours. Once symptoms resolve, there may be a gradual return to activities and play. Any reappearance of symptoms will place the patient back on activity limitations. In summary, the toolkit will consist of the PCSI and levels of activity permitted based on initial and ongoing assessments.
    Methods/Measures:
    1. Chart review pre and post toolkit implementation to measure whether patients received this standard assessment within 24 hours of intake/admission.
    2. A questionnaire completed pre- and post- education session (either on paper or online questionnaire) by the psychiatric technicians to measure their knowledge of the protocol and signs and symptoms of mTBI
  - **Data Management:**
    1. This measure will be recorded as yes/no whether patient received an assessment. An additional measurement may be barriers to why an assessment was not completed within the 24-hour timeframe. Patient data will be de-identified. Data collected will be password protected on Excel spreadsheet on an encrypted device.
    2. Pre- and post- educational session scores will be compared. Questionnaires will be de-identified. No patient data involved. Data collected will be password protected on Excel spreadsheet on an encrypted device. Adjustments to the presentation may occur to improve presentation and understanding of psychiatric technicians.
  - **Site(s) Support:** The study site will allow provide a space and times to allow for chart review, data collection, and presentation of the toolkit and protocol to the psychiatric technicians.

During the project implementation and evaluation, *Helen Liu* will provide regular updates and communicate any necessary changes to the DNP Project Preceptor.

Our organization looks forward to working with this student to complete their DNP project. If we have any concerns related to this project, we will contact *Helen Liu* and *Sharon Norman* (student's DNP Project Chairperson).

Regards,

DNP Project Preceptor — Nurse Manager of Youth and Family Services (Job Title)

Signature — 5/28/2021 (Date Signed)

Appendix E

IRB Letter of Determination

OREGON HEALTH & SCIENCE UNIVERSITY

IRB MEMO

Research Integrity Office
3181 SW Sam Jackson Park Road - L106RI
Portland, OR 97239-3098
(503)494-7887 irb@ohsu.edu

NOT HUMAN RESEARCH

September 15, 2021

Dear Investigator:

On 9/15/2021, the IRB reviewed the following submission:

Title of Study:	Implementing a Head Injury Assessment Protocol In Pediatric Mental Health Facility: A Quality Improvement Project
Investigator:	Sharon Norman
IRB ID:	STUDY00023251
Funding:	None

The IRB determined that the proposed activity is not research involving human subjects. IRB review and approval is not required.

Certain changes to the research plan may affect this determination. Contact the IRB Office if your project changes and you have questions regarding the need for IRB oversight.

If this project involves the collection, use, or disclosure of Protected Health Information (PHI), you must comply with all applicable requirements under HIPAA. See the HIPAA and Research website and the Information Privacy and Security website for more information.

Sincerely,

The OHSU IRB Office

Appendix F

Project Timeline

	Jul-Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Finalize project design and approach (703A)	X							
Complete IRB determination or approval (703A)	X							
Data collection		X						
PDSA Cycle 1 (703B)			X	X				
PDSA Cycle 2 (703B)					X			
Final data analysis (703B)						X	X	
Write sections 13-17 of final paper (703B)						X	X	X
Prepare for project dissemination (703B)								X