Implementing Behavioral Screening Protocols to Reduce Violence in the Emergency Department

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Abstract

Problem and Purpose: The opioid crisis and lack of mental health resources for patients are two leading causes of elevated levels of violence in the emergency department. As a result, a rise in patient aggressive behavior including verbal and/or physical attacks against emergency department staff has occurred. This increase in violence led to a new restraint protocol and a subsequent increase in restraint orders, though restraint use is not recommended evidence-based practice. The purpose of this quality improvement project was to implement a behavioral assessment protocol for identifying aggressive patient behaviors and reduce physical restraint use in the emergency department at a community hospital.

Methods: The protocol was implemented through a quality improvement project using two behavior identification tools to reduce possible violent incidences against staff thus reducing restraint orders. A modified Dynamic Appraisal Situational Aggression was given to every patient in the emergency to self-identify potential aggressive behavior. The Violence Assessment Tool was completed by the nurse on patients when their score on the modified Dynamic Appraisal Situational Aggression was greater than three. Anytime the Violence Assessment Tool has to be completed, the nurse was required to evaluate the combined tool scores for level of risk. Risk reduction and de-escalation strategies were implemented based on the identified risk level.

Results: The data reflects a successful implementation of the protocol with 95% of the emergency department nurses completing the protocol when required, along with patients completing the modified Dynamic Appraisal Situational Aggression at a rate of 98% upon intake. Analysis of the data's clinical component reflects successful reduction of restraint orders from 27.5% to 1.5% percent.

Conclusions: The project can be replicated across all departments in the hospital, specifically acute settings and mental health. Educating all new staff regarding the implementation protocol and the de-escalation methods is recommended. In addition, adding a flag to the electronic medical record to alert nurses that a patient completing the modified Dynamic Appraisal Situational Aggression has met the threshold and the completion of the Violence Assessment Tool is necessary. Both recommendations will allow for the results of the project to be sustained and replicated.

Introduction

Violent and/or aggressive behavior by patients towards health care providers occurs in various settings, both outpatient and inpatient. The emergency department (ED) is the intake point for many patients in crisis whose behavior may shift towards aggression directed towards the clinical staff responsible for their care. Aggression is defined by the motivation of a person to cause harm to another person through their behavior (Brugman et al., 2015). While violence predictor tools exist and are used worldwide, this project focused on the use of a behavioral assessment screening protocol to screen for aggressive or violent behavior in the ED. The protocol included the combination of both patient and provider input into two tools, the modified Dynamic Appraisal Situational Aggression (DASA) and the Violence Assessment Tool (VAT).

The Community Needs Health Assessment (CNHA, 2018) reported geographic, socioeconomic, or cultural norms and unaddressed physical health issues are all factors related to patient mental or behavioral health. In the region surrounding the community hospital there is a distinct lack of mental health services and primary care provider access, with a ratio of 400 patients to each mental health provider and 990 patients to each primary care provider. The region also saw one of the largest elevations in drug related deaths in 2017. Patients with issues related to excessive drinking were reported by 16 percent of adults (CNHA, 2018). Both issues have led to an alarming number of ED visits in the region, exceeding state targets by a rate of 2,952.4 per 100,000 residents for ED mental health visits and 1,290.4 per 100,000 for ED addiction-related visits (CNHA, 2018). Patients with substance abuse issues or mental health problems are statistically more likely to engage in violent behavior when compared to the population as a whole (Maagerø-Bangstad, Sælør, & Ness, 2019).

The ED at the community hospital saw an increase in violence and aggressive behavior in patients and required an evidence-based practice solution. For example, several nurses had been bitten, kicked and punched, as well as threatened and verbally abused (Personal communication with emergency room staff, Feb 15, 2019). As a result, the number of restraint orders in the ED had increased to an average of 100 per month in the three months prior to the quality improvement (QI) project implementation. The purpose of the QI project was to implement a behavioral screening protocol tool, involving both patient and provider, to reduce the number of restraint orders and restraint use at a community hospital ED.

Literature Review

This literature review examined the evidence focusing on successful implementation of aggressive behavior tools to reduce the incidence of assaultive events in the ED. Four studies were evaluated during this literature review, related to identification and de-escalation of violent behavior in patients presenting to the ED (Appendix A). The three reviewed studies were directly related to assessment tools, with information gathered from both patient data and staff interviews.

The first study also known as the RATIVE study used systematic review and metanalysis to review the properties and predictive properties of different tools that have been used to predict imminent violence. Imminent violence for the purposes of the RATIVE study is within the next 24 hours (Dickens et al., 2019). For the purposes of this study 50 papers were included in a narrative review and 31 papers related primarily to the Broset Violence Checklist and the DASA were included in the meta-analyses. The narrative synthesis or systematic review grouped data into clusters representing characteristics of good psychometric tools. Descriptive statistics (frequencies, means) were calculated creating Area under the Curve (AUC'*s*) representing

predictive efficacy. The final outcome categories were: “any aggression”, “physical aggression against people”, “physical aggression against objects”’, “verbal aggression”, and “self-harm”. AUC values were converted to Cohen’s *d* values, then to Hedge’s *g* values to reduce potential bias. Meta-analyses of predictive validity studies were also conducted. Hedge’s *g* values, weighted by inverse variance, were pooled in a random-effects model including the standard error (SE) of study effect sizes given that prediction was for events rather than individuals, these were calculated based on aggressive vs. non-aggressive events.

After running these tests, the RATIVE study concluded that only the Dynamic Appraisal of Situational Aggression and the Brøset Violence Checklist were subject to implementation research in which the tools were largely rated as having utility for, and being acceptable to, user-participant (Dickens et al., 2019). After removing any outliers, the Brøset Violence Checklist had Hedges’ g values of 1.35 with a confidence interval (CI) of [1.15-1.56] for prediction of aggression against people and g = 1.24 with a CI of [0.99-1.50] for any aggression. Applying the same process to the Dynamic Appraisal of Situational Aggression *g* = 1.04 with a CI of [0.69-1.39] when predicting aggression against people and 0.88 with a CI of [0.62-1.15] when predicting any type of aggression. Moderator analyses revealed pooled effect sizes for both schemes were decreased by low study bias risk and increased by patient forensic vs. civil legal status.

The Fordham Risk Assessment Tool (FRST) focused on 210 patients in the psychiatric unit of an urban hospital. Using a flowchart model, the FRST was designed to help the clinician determine if a patient requires a more complete violence risk assessment in an in-patient setting (Rosenfeld et al., 2017). The patients screened were previously diagnosed with varied psychiatric issues such as mood disorders, psychotic disorders, substance abuse disorders, and personality

disorders. Of this initial group of 210, a cohort of 78 patients were determined to require additional screening after being evaluated and identified as displaying risk factors for violent behavior. These factors included violent ideation, threats or severe violent behavior. Thirteen of the 14 high-risk individuals (92.8%) were identified as needing a violence risk assessment by the FRST, as were 39 of 52 moderate-risk individuals (75.0%). Sensitivity was 92.8%, 95% CI [.64, .99], in identifying high risk individuals, and 78.8%, 95% CI [.67, .88], in differentiating high- or moderate-risk patients from low risk (Rosenfeld et al., 2017). The authors concluded that the FRST was a viable method for identifying aggressive behavior.

The third study performed by Pich, Kable, and Hazelton in 2017, examined violence in the ED from the nurse's perspective. The Violence in Emergency Nursing and Triage (VENT) study was distributed to all members of the College of Emergency Nurses' Australia (CENA), 537 responses were returned. The highest risk of violence was 82% and identified in patients 35 years of age and younger. Similar to the RATIVE study by Dickens et al., pacing, tone of voice, and agitation were all identified as violence warning signs. The warning signs accompanied clinical presentations such as substance abuse, mental health issues, and the largest differential percentage of 94% linked to alcohol intoxication. However, mental health issues were a strong category with 77% as well, with escalation of violent episodes linked to both exacerbation of sensory overload and extended wait times. Triaging was determined to be the highest risk nursing activity. The odds of having experienced a violent episode were almost three times higher for nurses engaged in the triaging of patients. Since, the majority of triage occurs in the ED, this speaks to a need for identification of mental health issues through efficient assessment and triage, as well as expedited transfer to a safe and non-threatening environment with access to psychiatric staff.

Collectively, all three studies confirmed the need for early assessment of potential violent behavior in patients presenting to the ED to prevent injury to patient and clinicians involved in their care. Using the information from these studies, this QI project combined many of the tools to implement the Behavioral Screening Protocol in the ED. From the RATIVE study, the Broset Violence Assessment Checklist was used in the form of the Violence Assessment Tool which was created specifically from the Broset for the ED. Also, from the RATIVE study, the DASA was used in modified form to be completed from the patient perspective. The VENT study provided many of the de-escalation techniques that nurses were reminded to use from prior trainings. Given that all three of these things worked individually to a certain extent. The QI project put forth the question what if they were all combined.

Theoretical Framework

Kurt Lewin's Theory of Planned Change was chosen as the theoretical framework for this project. The Theory of Planned Change (TPC) uses the three pillars of driving forces, restraining forces, and equilibrium to create a streamlined and compact model for change management (Lewin, 1947). This is further distilled into a triumvirate of stages, consisting of unfreezing, movement, and refreezing which flow in a linear manner to produce the desired change. Applying that to the proposed project, we begin with unfreezing, which simply focuses people to find new methods of functioning to cease utilizing counterproductive methods which impede their progress (Lewin, 1947). This correlates with the need for stakeholder identification after a literature review of evidence-based practices regarding aggressive behavior management tools and those stakeholders championing change.

Movement is the next stage in the sequence, which directs the parties involved to begin all necessary movement towards the desired change. This stage will involve reviewing the

evidence for the behavioral assessment protocol, adapting the tool to allow for both patient and provider input, explanation of grading scores with an eye towards behavioral assessment by the clinical staff, and implementation of the protocol. Lewin's final stage is refreezing, which requires involved parties to cement the changes as a permanent routine and refrain from retrograde movement towards previous norms. In this manner, we see the project becoming an adopted and embraced component of aggression assessment in the treatment milieu. Because the implementation of the behavioral screening protocol will provide stability and routine, the use of the tools will become second nature. Once the staff sees a reduction in violence and a decrease in restraint orders and the use of restraints, they would see the value in early intervention. Resulting in a sustained protocol.

Methods

This quality improvement project implemented a behavioral screening tool to reduce violence in a community ED. Inclusion criterion included all patients admitted to the ER that were willing and capable of completing the first step in the protocol. Exclusion criteria includes any patient who were unwilling or unable to complete the modified DASA. Approximately 2000 patients per month were affected by this practice change through the violence and aggressive behavior risk assessments and de-escalation protocol. Non-Human Subjects Research (NHSR) determination was obtained from the University of Maryland Baltimore Institutional Review Board (IRB), and the organization's IRB. This project was implemented over a ten-week period.

Pre-implementation education and training occurred during three-unit staff meetings and consisted of a PowerPoint presentation, handouts and a paired pre and post mini-quiz. Education also included information regarding different types of violent/aggressive behavior, the patient

population being targeted, how to analyze the results of the tools and goals of the quality improvement project. While the pre and post surveys evaluated the ED, staffs perceived knowledge of the behavioral assessment protocol and the planned quality improvement project. While the QI project recommended the use of de-escalation techniques, the community hospital indicated they had their own protocols regarding this, so it was not included in pre-implementation education.

Prior to the practice change patients coming to the ED were not evaluated for possible aggressive behavior. Communication was maintained with the ED unit managers and champions through emails, one-on-one's and meetings. Weekly huddles were used to communicate audit results, identify compliance issues and provide any clarity necessary to the ED nurses or other stakeholders.

Full implementation of the Behavioral Assessment Protocol uses of the DASA and the VAT (Appendix B and C respectively) occurred approximately one-week post education. Protocol implementation required participation of ED patients, as well as the nurses. The week prior to full implementation was used as a trial period for both RN's and patients to understand the timing. All ED patients completed the modified DASA upon entry. Based on the score of that assessment, the RN determined whether to complete the VAT. The modified DASA provided patients with a score ranked from 0-2 or low risk, 3-4 or moderate risk and greater than 4 which is high risk. If the patient scored 3 or greater on the modified DASA, the ED nurse was required to complete the VAT.

Once the VAT was completed by the RN, the score on the patients' VAT and the score on their DASA were combined to determine the next step. If the patients' combined score was between 4 and 6, the patient was moderate risk and needed to be moved to a quiet space with low

lighting, de-escalation techniques used, and monitored for any increased risks. If the combined scored was greater than 7, the patient was immediately moved to isolation and referred to behavioral health.

During this time period, audits over staff compliance and completed behavioral assessment rates were completed weekly. Appendices G and H contain the audit tools. The data collected from Modified DASA and the VAT (Appendices B and C) included both patient and ED nurse completion of the risk assessment, classification level and restraint orders. The completed behavioral tools were used to collect data related to patient level of risk as identified by the patient, the practitioner and the interventions that followed. This data was recorded into an audit tool to make data analysis easier. The patient risk level tools are included as Appendices F and G. These were completed daily by the ED unit champions or managers and analyzed by the project leader weekly.

Staff compliance was completed on a weekly basis by comparing the completed tools to the number of patients meeting the inclusion criteria. This data was completed on a staff compliance audit tool included as Appendix H. Audit tool percentages were calculated and compared to project goals. Staff compliance goals included 60% by week two of implementation, 80% by week five, and 100% staff compliance by week six.

Data was entered into Excel and analyzed. Risk Level data collected by the completed behavioral assessment tools was analyzed using descriptive statistics including central tendency (mean, median, and mode) and variability (range, standard deviation). A two-tail independent samples t-test was run in excel as well to analyze the mean number of restraint orders pre and post implementation to determine if the change was statistically significant. Audit tool percentages were calculated and compared to project goals for staff compliance. Run charts from

the audit tools were analyzed for outliers, trends, shifts, and runs. At the completion of the project, the overall rate of violent incidences leading to restraint orders that occurred in the ED was reduced from 27.5% to 1.52%.

Results

Over the 11-week implementation period 2037 patients were included in the data collection. Data was collected daily and analyzed weekly. Data collection tools were presented in Appendix D and E. Data was analyzed and presented as run charts related to number of patients identified as being medium to high risk and those identified as being medium to high risk that required restraints. In Appendix B, the table shows the use of descriptive statistics to compare whether the reduction in restraint orders was of significance. Data compilation showed 85 of the 2084 patients that were evaluated as having the potential for violence required restraint orders. Of those 85 patients that required restraints 62 were originally identified or scored as being at high risk for violence and 23 were identified as being at medium risk. The pre and post implementation showed a decrease in restraint orders from 27.5% to 1.5%. A two-tail independent samples t-test was performed. The observed difference between the sample means (26.33 – 9.44) saw a statistically significant decline in restraint orders ($p < .05$).

Key facilitators that impacted the project outcomes included continued support of the medical director and clinic administrator. The clinic staff embraced the practice change without hesitation after education and competency. Following the initial education and the pre and post mini quiz, the clinic staff was periodically asked questions or offered advice if there were issues with compliance. An earlier barrier to the proposed isolation area was the need for space. This barrier was overcome when ED leadership worked with the hospital to

repurpose a storage area, the project leader and clinic staff members helped to clear and clean the space.

There were no identified unintended consequences in terms of failures or costs. Changes in practice included edits to the intake sheet and process for patients. The use of a combined patient and clinician protocol led to a better identification of potential violent behavior. The reduction in violence has the potential to lead to a reduction in turnover among nurses in the ED, violent incidents and restraint orders. All of these individually would create buy-in, but the likelihood of fixing all three will lead to the long-term sustainability of the project. This tool would also assist in assessment and improved outcomes in other departments within the hospital including the Inpatient Behavioral Health department.

Discussion

The initial implementation plan and data collection was focused on the behavioral assessment protocol. Following the initial education of all departments the compliance for the nurses and patients was 95% and 98% respectively. The patient compliance was expected as the modified DASA was simply added to their intake record. The reduction in RN compliance was unsurprising due to the lack of an EHR notification that the VAT had not been completed.

As was noted in Dickens, et al. (2019), the longer the DASA or the Broset were in place the more compliant RNs became and the more it was used in other areas of the hospital. The focus of the QI project was to use both the DASA and the Broset. The common outcome measures in the literature included successfully identifying potential aggressive or violent behavior using either one. The literature also recommended having patients self-identify in the hopes that creating some self-awareness may reduce the likelihood of violence. Given this information, the QI project adopted a modified DASA that could be completed by the patient and

a modified Broset (VAT) that was specific to the ED. The combination of the two tools allowed for results that were significantly similar and often better than what was seen in the literature as it related to the reduction of restraint use due to violence.

The goal was for 100% of all patients admitted to the ED to complete the modified DASA by the end of the implementation period. This goal was not met as some patients were physically unable or unwilling to complete the evaluation. The goal was for 100% of the nurses to be completing the VAT when required, however by the end of the implementation period that number was 95%. Implementation of the screening protocol and a flag if the risk score is high into the electronic health record (EHR) would help to further increase compliance risk screening. The EHR flag might also include a mandatory input for the VAT score to identify the need for de-escalation techniques and enhance sustainability. Restraint orders were reduced from 27.5% to 1.5% over the12-week implementation period. More strategies aimed toward reduction of restraint orders have been discussed, but the use of the behavioral assessment protocol will be continued. This may include increased use of isolation areas and other de-escalation techniques.

The behavioral assessment protocol was successfully implemented as a quality improvement project and was shown to be effective in identifying patient aggressive or violent behavior and subsequent restraint use in the ED. The components of protocol were also selected due to the ease of use in the ED, lack of additional charges to the patient, and the ability to obtain data in real-time. Implementing a behavioral assessment protocol provided objective clinical information regarding possible aggressive behavior that created individualized patient management and treatment options. The project was able to identify patients in crisis and at risk of violence and to reduce restraint orders in the ED.

Conclusions

The goal of any measure of possible aggressive behavior is to provide an accurate representation of their mental health and how it might affect their own physical health and the physical health of those around them by removing bias associated with using only patient self-report or only provider subjective opinion.

The QI project findings correlate with the original study results, supporting the use of a violence risk assessment to help implement measures to de-escalate aggressive or violent behaviors. Project data reports that 62 out of 550 patients identified as a high-risk for violence required restraints and 23 out of 1360 identified as medium risk for violence required restraints. At the conclusion of the project implementation timeline, there was a reduction in the number of patients that exhibited violence thereby reducing restraint orders.

The use of a combined patient and clinician protocol led to a better identification of potential violent behavior. The reduction in violence has the potential to lead to a lessening in turnover among nurses in the ED, violent incidents and restraint orders. The QI project's sustainability lies in the ease of implementation. Adding the VAT to the EHR would increase compliance by creating a missing item flag to remind nurses that they have not completed the assessment. The additional requirements for implementation, adding the modified DASA to admission papers, requires no additional cost to the patient and gives the RN the ability to obtain real time data to assist downstream providers in formulating appropriate treatment plans. The behavioral assessment protocol could also potentially assist in assessment and improved outcomes in other departments within the hospital, including the inpatient behavioral health department and the neurological intensive care unit. Inpatient behavioral health would use the behavioral assessment protocol in much the same way as the ED, by

having the patient complete the modified DASA and the RN complete the VAT. The neurological intensive care unit may require modification, such as the caregiver filling out the modified DASA, depending on the cognitive ability of the patient.

This behavioral assessment protocol is not just about patient and clinician safety, but a step forward in retaining patient dignity. Future QI projects and education regarding the behavioral assessment protocol as an objective measurement of patients' mental health status will be helpful in reducing the use of restraints and reinforcing the patient's right to appropriate treatment.

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Appendix A

Evidence Review Table

Author, year	Study objective/intervention or exposures compared	Design	Sample (N)	Outcomes studied (how measured)	Results	*Level and Quality Rating
Dickens, et al., 2019	To systematically review the properties and predictive performance of structured schemes that have been used to predict imminent aggression.	Systematic review and meta-analysis.	N=50 included in narrative review N=31 were included in meta-analyses related to the DASA and the	Narrative synthesis using quantitative data, findings were extracted and grouped into clusters representing categories related to characteristics of good psychometric tools. Information was tabulated and descriptive statistics (frequencies, means) were calculated. Area under the Curve (AUC'*s*) representing predictive efficacy were organized into clusters in terms of the tool used and then outcome type. The final outcome categories were: "any aggression", "physical aggression against people", "physical aggression against objects"', "verbal aggression", and "self-harm". AUC values were converted to Cohen's *d* values, to measure effect size appropriate for random effects models using a conversion spreadsheet They were then converted to Hedge's *g* values to reduce potential bias. Meta-analyses of predictive validity studies were conducted using R. Hedge's *g* values, weighted by inverse variance, were pooled in a random-effects	Five schemes (Brøset Violence Checklist, HCR-20: Assessing Risk for Violence version 2.0 clinical subscale, Dynamic Appraisal of Situational Aggression and its variants for youth and for women) have been subject to relevant research. Fifty papers were included in a narrative review, and 31 comprising 26 samples involving 282,238 assessments for 2723 individuals were included in meta-analyses. Only the Dynamic Appraisal of Situational Aggression and the Brøset Violence Checklist were subject to implementation research in which the tools were largely rated as having utility for, and being acceptable to, user-participants. Many studies have not established interrater reliability of the tools in the field.	1A

			Broset Violence Checklist	model using the rma function using the metafor package. This requires entry of the standard error (SE) of study effect sizes: given that prediction was for events rather than individuals, these were calculated based on the dichotomous outcome of all events (aggressive vs. non-aggressive) in the sample. The metafor package calculates 95% confidence intervals and conducts homogeneity tests using the Q and I^2 statistics. The former is distributed as a chi-square with k –1 degrees of freedom (where $k = n$ independent effect sizes) and the latter describes the percentage of variation across studies ($I^2 = 100\% \times (Q - \text{d.f.})/Q$). In order to detect outlier cases that could overly influence the study data set, Forest plots were visually inspected; potential outliers were defined as individual studies whose effect size 95% CIs fell outside those of the pooled effect size of all studies in that analysis. The analysis was then repeated without the potential outlier and, where the subsequent Q statistic was half or less of its original magnitude, the removed study was defined as an outlier. Changes in both fixed and random effect pooled estimates from the analyses with and without outliers were noted.	After removing outliers, pooled effect sizes for prediction of aggression against people and for any aggression were, respectively: Hedges' g = 1.35[1.15–1.56]) and g = 1.24[0.99, 1.50] for the Brøset Violence Checklist and g = 1.04 [0.69, 1.39] and 0.88 [0.62, 1.15] for the Dynamic Appraisal of Situational Aggression. Moderator analyses revealed pooled effect sizes for both schemes were decreased by low study bias risk and increased by patient forensic vs. civil legal status.	
Pich et al., 2017	The VENT Study, (Violence in	A cross-sectional design was	N=537, including nurses	Measure the risk of experiencing an episode of violence in the last six months, and its association with demographic,	Patient-related violence was reported by 87% of nurses in the last six months. Precipitants and	4B

	Emergency Nursing and Triage), was a national study of Australian Emergency nurses' experiences with patient-related violence. The aims of this study are to report on patient-related violence experienced by emergency nurses in Australia and to describe the precipitants and antecedents of violent episodes.	used, and data were collected using a purpose developed survey tool	who had worked clinically in an Australian ED in the last six months, and were members of the College of Emergency Nurses' Australasia (CENA)	patient-specific, nursing-specific and emergency-department specific variables. Categorical data were compared using Pearson's chi-square analysis with 5% significance. Uni- and multivariable logistic regression analysis was performed to estimate odds ratios for these associations (both crude and adjusted). Independently associated, statistically significant variables ($p < 0.05$) that had less than 10% missing values were entered into multivariate logistic regression model. These were age, years of experience working in the ED, alcohol intoxication, substance misuse and triage. The reference group was involvement in one or more episodes of patient-related violence in the last six months. Variables were reduced stepwise ($p < 0.1$) until only significant variables ($p < 0.05$) remained.	antecedents for episodes of violence were reported in three categories: nurse-related; patient-related and emergency-department specific factors. Triaging was identified as the highest risk nursing activity, and the triage area identified as the highest risk location in the department. Patients who presented with alcohol intoxication, substance misuse or mental health issues were identified as the groups at greatest risk for potential violence. The odds decreased by approximately 60% for nurses aged 40 years and older (OR = 0.41, 95% CI 0.24, 0.69), ($p = 0.001$). More experienced emergency nurses were also found to have a decreased risk of violence (OR = 0.96, 95% CI 0.93, 0.99) ($p = 0.006$). Nursing activities were compared against the variable "violent episode in the last six months" using a chi-squared analysis and triaging, managing patients' reactions to delays and restraining patients were all found to be highly significant ($p < 0.001$). Assisting patients in the waiting room ($p =$	

					0.001) and communicating with patients (p = 0.003) were also found to be predictors of episodes of violence Triaging was determined to be the highest risk nursing activity and the results of a logistic regression analysis found that the odds of having experienced a violent episode were almost three times higher for nurses engaged in the triaging of patients (OR = 2.91, 95% CI 1.80, 4.71) (p < 0.001).	
Rosenfeld et al., 2017	The aim of the Fordham Risk Screening Tool (FRST) was to assess violence risk of psychiatric patients in an inpatient facility and determining the need for further, more thorough violence risk assessment.	Control trial without randomization	FRST: n=210 civil psychiatric patients	A 2-way mixed model with absolute agreement was analyzed the Risk of Violence using FRST scoring based on the following: 1. Recent and severe violent behavior 2. Patient has previously made threats or made threats during the interview 3. Patients that displayed paranoid ideation 4. Patients displaying agitation during the initial interview 5. Patients who were non-compliant with medication regimen	Of the 23 participants who displayed agitation during the FRST interview, 10 (43.5%) were deemed to need a violence risk assessment for other reasons, $X^{2=}$ (1, *N*=129) 8.42, *p* <.001, □= .38. HCR-20^{V3} ratings were available for 159 of the 210 study participants (75.7%). 14 individuals (8.8%) were classified as high risk, 52 (32.7%) were rated as moderate risk, 93 (58.5%) as low risk 13 of the 14 high-risk individuals (92.8%) were identified as needing a violence risk assessment by the	3A

				6. Use of HCR-20^{V3} Case Prioritization ratings to determine level of risk	FRST, as were 39 of 52 moderate-risk individuals (75.0%). Sensitivity was 92.8%, 95% CI [.64, .99], in identifying high risk individuals, and 78.8%, 95% CI [.67, .88], in differentiating high- or moderate-risk patients from low risk. Of the 93 participants (58.5%) classified as low risk on the HCR-20^{V3},28 were identified as needing a violence risk assessment by the FRST (i.e., a false-positive rate of 30.1%). Specificity for identifying low-and moderate-risk was 53.8%, 95% CI [.45, .62], and 69.9%, 95% CI [.59, .79], when identifying only low-risk individuals.	

Rating System for Hierarchy of Evidence

Level of the Evidence	Type of the Evidence
I (1)	Evidence from systematic review, meta-analysis of randomized controlled trails (RCTs), or practice-guidelines based on systematic review of RCTs.
II (2)	Evidence obtained from well-designed RCT
III (3)	Evidence obtained from well-designed controlled trials without randomization
IV (4)	Evidence from well-designed case-control and cohort studies
V (5)	Evidence from systematic reviews of descriptive and qualitative studies
VI (6)	Evidence from a single descriptive or qualitative study
VII (7)	Evidence from the opinion of authorities and/or reports of expert committees

(Melnyk & Fineout-Overholt, 2014)

Rating Scale for Quality of Evidence

A: High – consistent results with sufficient sample, adequate control, and definitive conclusions; consistent recommendations based on extensive literature review that includes thoughtful reference to scientific literature

B: Good – reasonably consistent results; sufficient sample, some control, with fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C: Low/major flaw – Little evidence with inconsistent results; insufficient sample size; conclusions cannot be drawn

(Newhouse, 2006)

Appendix B

MODIFIED DYNAMIC APPRAISAL OF SITUATIONAL REGRESSION: PATIENT INTAKE VERSION

The following ratings are based on your knowledge and observations of your personal behavior during the last 24 HOURS. Circle 1 (yes) if you have experienced the behavior in the last 24 hours including now and 0 (No) if you have not.	No	Yes
Irritability - Have you been easily annoyed or angered? Are you experiencing? difficulty tolerating the presence of others?	0	1
Impulsivity - Have you experienced dramatic mood changes or found it difficult to remain calm?	0	1
Unwillingness to follow directions - Do you find yourself becoming angry or frustrated when questioned or given directions?	0	1
Sensitivity to perceived provocation - Do you see the behavior of other people as being deliberate and harmful to you? Have you found yourself reacting with more anger than necessary for the situation?	0	1
Easily angered when requests are denied - Do you find yourself easily angered when a request is denied or when you are asked to wait?	0	1
Negative attitudes - Have you felt more anti-social or increasingly negative?	0	1
Verbal Threats - Have you deliberately used verbal outbursts to intimidate or threaten someone?	0	1
Physical Aggression - Have you slammed doors, thrown objects, kicked furniture, broken objects, etc.…		
Total		

Interpreting the DASA-IV – The Level of Risk for Inpatient Aggression

A final risk assessment is made after consideration of the results of the daily DASA-IV in addition to relevant clinical judgement. Interventions are determined following consideration of the available interventions in addition to knowledge of the patient and what may help the patient avoid aggression. The following is to be used as a guide for interpreting the scores obtained by a DASA-IV assessment.

DASA-IV Score	level of risk	action required
0-2	low	no remedial action is required
3-4	moderate	the patient should be monitored for additional indicators of inpatient risk. Staff should be alerted to the possibility that the patient will become more agitated. Preventive measures should be considered.
>4	high	remedial action is required. Staff must be alerted and the patient requires some remediation to prevent subsequent aggression from occurring.

(Barry-Walsh, Daffern, Duncan, & Ogloff, 2009)

Appendix C

Violence Assessment Tool (VAT)

This form is to be completed by clinical healthcare worker or manager/supervisor.

Patient's Name: Click here to enter text.

Identification #: Click here to enter text.

☐ **Initial Assessment**

Section A: Risk Indicators

Read the list of behaviours below and identify behaviours that will require specific care interventions. A score of 1 is applied for past occurrence of any of the History of Violence behaviours; and additional scores of 1 are applied for each observed behavior. Add the scores — **the maximum is 12**.

HISTORY OF VIOLENCE: Score 1 for past occurrence of any of the following:	SCORE
▪ Exercising physical force, in any setting, towards any person including a caregiver that caused or could have caused injury ▪ Attempting to exercise physical force, in any setting, towards any person including a caregiver that could cause injury ▪ Statement or behaviours that could reasonably be interpreted as threatening to exercise physical force, in any setting, against any person including a caregiver that could cause injury	Click here to enter text.
OBSERVED BEHAVIORS: Score 1 for each of the observed behaviour categories below if you see any of the following examples.	**SCORE**
Confused (Disoriented – e.g., unware of time, place, or person)	Click here to enter text.
Irritable (Easily annoyed or angered; Unable to tolerate the presence of others; Unwilling to follow instructions)	Click here to enter text.
Boisterous (Overtly loud or noisy – e.g., slamming doors, shouting etc.)	Click here to enter text.
Verbal Threats (Raises voice in an intimidating or threatening way; Shouts angrily, insulting others or swearing; Makes aggressive sounds)	Click here to enter text.
Physical Threats (Raises arms / legs in an aggressive or agitated way; Makes a fist; Takes an aggressive stance; Moves / lunges forcefully towards others)	Click here to enter text.
Attacking Objects (Throws objects; Bangs or breaks windows; Kicks object; Smashes furniture)	Click here to enter text.
Agitate/Impulsive (Unable to remain composed; Quick to overreact to real and imagined disappointments; Troubled, nervous, restless or upset; Spontaneous, hasty, or emotional)	Click here to enter text.
Paranoid / suspicious (Unreasonably or obsessively anxious; Overly suspicious or mistrustful – e.g., belief of being spied on or someone conspiring to hurt them)	Click here to enter text.
Substance intoxication / withdrawal (Intoxicated or in withdrawal from alcohol or drugs)	Click here to enter text.
Socially inappropriate / disruptive behaviour (Makes disruptive noises; Screams; Engages in self-abusive acts, sexual behaviour or inappropriate behaviour – e.g., hoarding, smearing feces / food, etc.)	Click here to enter text.
Body Language (Torso shield – arms / objects acting as a barrier; Puffed up chest – territorial dominance; Deep breathing / panting; Arm dominance – arms spread, behind head, on hips; Eyes – pupil dilation / constriction, rapid blinking, gazing; Lips – compression, sneering, blushing / blanching)	Click here to enter text.
TOTAL SCORE	Click here to enter text.
Patient's Risk Rating: ☐ Low (0) ☐ Moderate (1-3) ☐ High (4-5) ☐ Very High (6+)	

Completed By (Name/ Designation) Click here to enter text._____ **Date:** Click here to enter text.

Section B: Overall Risk Rating

Apply the total behaviour score to the Risk Rating Scale to determine whether the patient's risk level is low, moderate, high or very high. Each leve provides cues for further action to consider. If moderate or high / very high risk is determined, complete Section C to identify factors that may trigger or escalate violent, aggressive, or responsive behaviour and ensure the care plan includes measures to avoid or reduce risk behaviours identified.

Overall Score	Actions to take
Low Score of 0	▪ Continue to monitor and remain alert for any potential increase in risk ▪ Communicate any change in behaviours, that may put others at risk to the manager / supervisor ▪ Ensure communication devices / processes are in place (e.g., radio, personal safety / man-down alarm, check-in protocol and / or global positioning tracking system)
Moderate Score of 1-3	▪ Apply flag alert ▪ Promptly notify manager / supervisor so they can inform relevant staff and coordinate appropriate staffing and workflow ▪ Request additional assistance / police back-up, when needed ▪ Scan environment for potential risks and remove if possible ▪ Address known triggers, behaviours and implement organization / provincially accepted safety measures appropriate for the situation ▪ Use effective therapeutic communication (e.g., maintain a calm, reassuring demeanor, remain non-judgmental and empathetic) ▪ Be prepared to apply behaviour management and self-protection techniques appropriate for the situation in accordance to organizational policy / Montessori – training programs provided may include GPA, Montessori, SMG, P.I.E.C.E.S, U-First, Stay Safe MORB training, self-defense ▪ Ensure communication devices / processes are in place (e.g., radio, personal safety / man-down alarm, check-in protocol and / or global positioning tracking system) ▪ Communicate any change in behaviours, that may put others at risk to manager / supervisor ▪ Inform client of VAT results, when safe to do so other ▪ Other: _____
High Score of 4-5 OR Very High Score of 6+	▪ Apply flag alert ▪ Promptly notify program manager / supervisor so they can ensure relevant staff are on high alert and prepared to respond ▪ Request additional assistance / police back-up, when needed ▪ Scan environment for potential risks and remove if possible ▪ Address known triggers, behaviours and implement organization / provincially approved safety measures appropriate for the situation for both clients and workers ▪ Initiate applicable referrals ▪ Use effective therapeutic communication (maintain a calm, reassuring demeanor, remain non-judgmental and empathetic) ▪ Be prepared to apply behaviour management and self-protection techniques in accordance to organizational policy / Montessori – training programs provided may include GPA, Montessori, SMG, P.I.E.C.E.S, U-First, Stay Safe MORB training, self-defense ▪ Ensure communication device / process is in place – (e.g., phone, personal safety / man-down alarm, check-in protocol and / or global positioning tracking system) ▪ Communicate any change in behaviours, that may put others at risk, to the program manager / supervisor ▪ Activate emergency communication codes as necessary ▪ Inform client of VAT results, when safe to do so ▪ Other:_____

Section C: Contributing Factors

Physical, psychological, environmental, and activity triggers can lead to or escalate violent, aggressive or responsive behaviours. Documenting known triggers and behaviours and asking your patient or substitute decision maker (SDM) to help identify them can help you manage them more effectively and safely. Use the information collected and the intervention resources listed on p.2 and p.11 of the PSHSA Individual Client Risk Tool to develop an individualized violence prevention care plan and a safety plan to protect workers at risk.

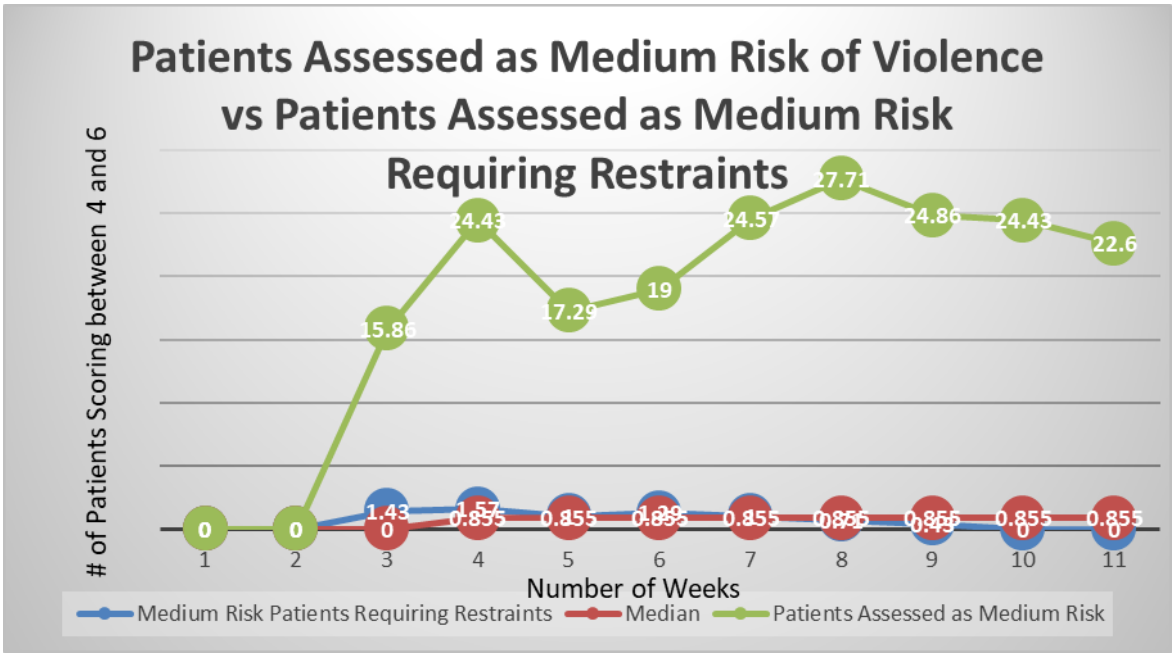
QUESTION FOR CLIENT:	CONSIDERATIONS – Select any that Apply			
	PHYSICAL	**PSYCHOLOGIAL**	**ENVIRONMENTAL**	**ACTIVITY**
To help us provide the best care possible, please describe if there is anything during your stay that could cause you to become agitated, upset or angry e.g., I am agitated when…	☐ hunger ☐ pain ☐ infection ☐ new medication ☐other Click here to enter text._____	☐fear ☐ uncertainty ☐feeling neglected ☐ loss of control ☐ being told to calm down ☐ being lectured ☐other Click here to enter text._____	☐ noise ☐ lighting ☐temperature ☐ scents ☐privacy ☐ time of day ☐days of the week ☐visitors ☐small spaces/ overcrowding ☐other Click here to enter text._____	☐bathing ☐medication ☐past experiences ☐ toileting ☐changes in routine ☐resistance to care ☐other Click here to enter text._____
What works to prevent or reduce the behaviour(s) e.g., When I am agitated, it helps if I…	☐Go for a walk ☐Listen to music ☐Watch TV ☐Draw ☐Read (Bible/Book) ☐Have space and time alone ☐Talk 1:1 with _____ Click here to enter text. (who?) ☐Participate in activities ☐Consult a family member or friend	**POTENTIAL DE-ESCALATION TECHNIQUES** Identify potential de-escalation strategies using above information such as respect personal space, actively listen, offer choices, give eye contact, use humor Click here to enter text._____		

(VAT, 2016)

Appendix D: Statistical Analysis of Restraint Orders before and after Implementation

t-Test: Two-Sample Assuming Equal Variances	Number of Restraint Orders per week before Implementation	Number of Restraint Orders per week after Implementation
Mean	26.33333333	9.444444444
Variance	12.5	41.77777778
Observations	9	9
Pooled Variance	27.13888889	
Hypothesized Mean Difference	0	
df	16	
t Stat	6.877194448	
P(T<=t) one-tail	1.85976E-06	
t Critical one-tail	1.745883676	
P(T<=t) two-tail	3.71953E-06	
t Critical two-tail	2.119905299	

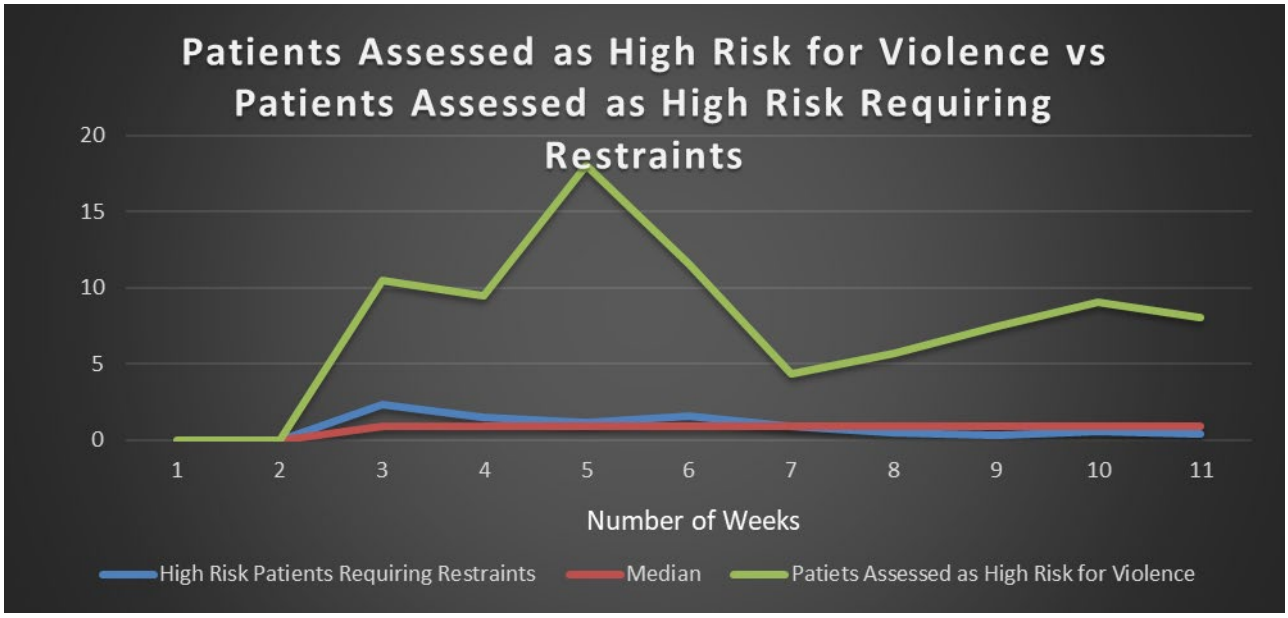
Appendix E: Patients with Medium Risk of Violence Run Chart and Audit Tool



1	0	0	0
2	0	0	0
3	1.43	0	15.86
4	1.57	0.855	24.43
5	1	0.855	17.29
6	1.29	0.855	19
7	1	0.855	24.57
8	0.71	0.855	27.71
9	0.43	0.855	24.86
10	0	0.855	24.43
11	0	0.855	22.6

Behavioral Assessment Protocol Audit Tool-Medium Risk							
Patient	VAT Checklist Score (RN Completed)	Modified DASA Tool Score (Pt Completed)	Total Score	# of Patients combined score between 4-6	# of Patients that required restraints	# of Patients Evaluated	% of Patients that required restraints
1			0				
2							
3							
4							
5							

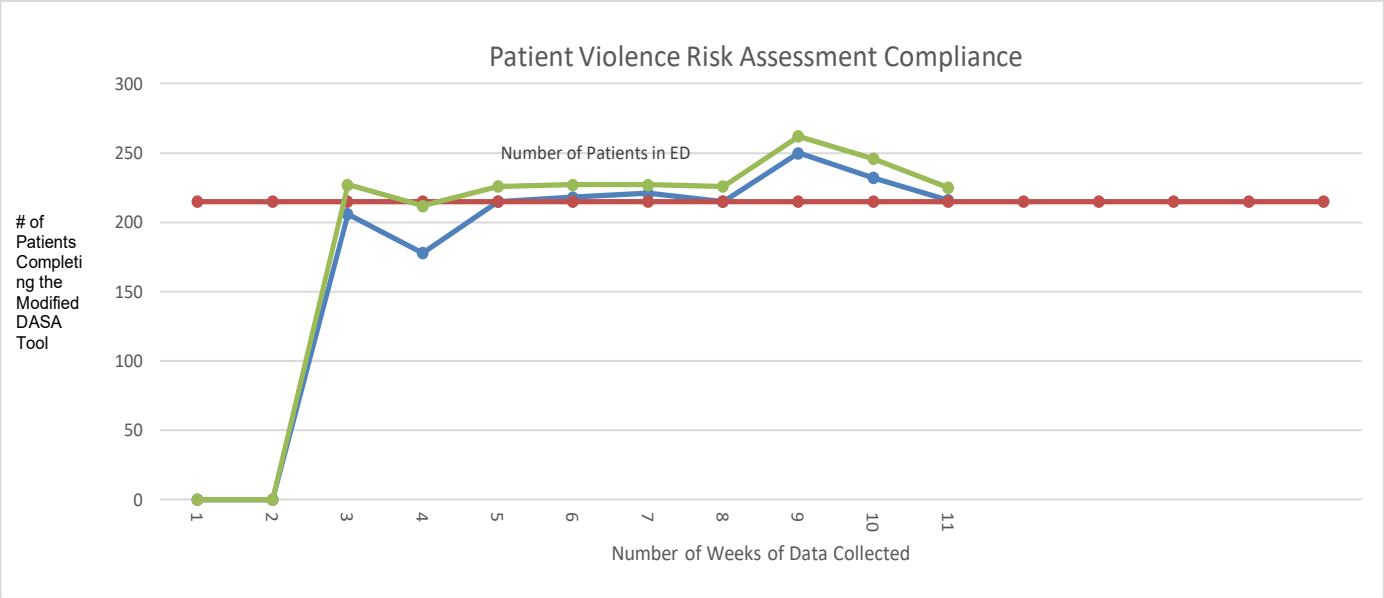
Appendix F: Patients with High Risk of Violence Run Chart and Audit Tool



	0		0
	0		0
	0		0
1	0	0	0
2	0	0	0
3	2.29	0.86	10.43
4	1.43	0.86	9.43
5	1.14	0.86	18
6	1.57	0.86	11.57
7	0.86	0.86	4.29
8	0.43	0.86	5.71
9	0.29	0.86	7.43
10	0.57	0.86	9
11	0.4	0.86	8

Behavioral Assessment Protocol Audit Tool - High Risk							
Patient	VAT Checklist Score (RN Completed)	Modified DASA Tool Score (Pt Completed)	Total Score	# of Patients combined score greater than 6	# of Patients that required restraints	# of Patients Evaluated	% of Patients that required restraints
1			0				
2							
3							
4							
5							

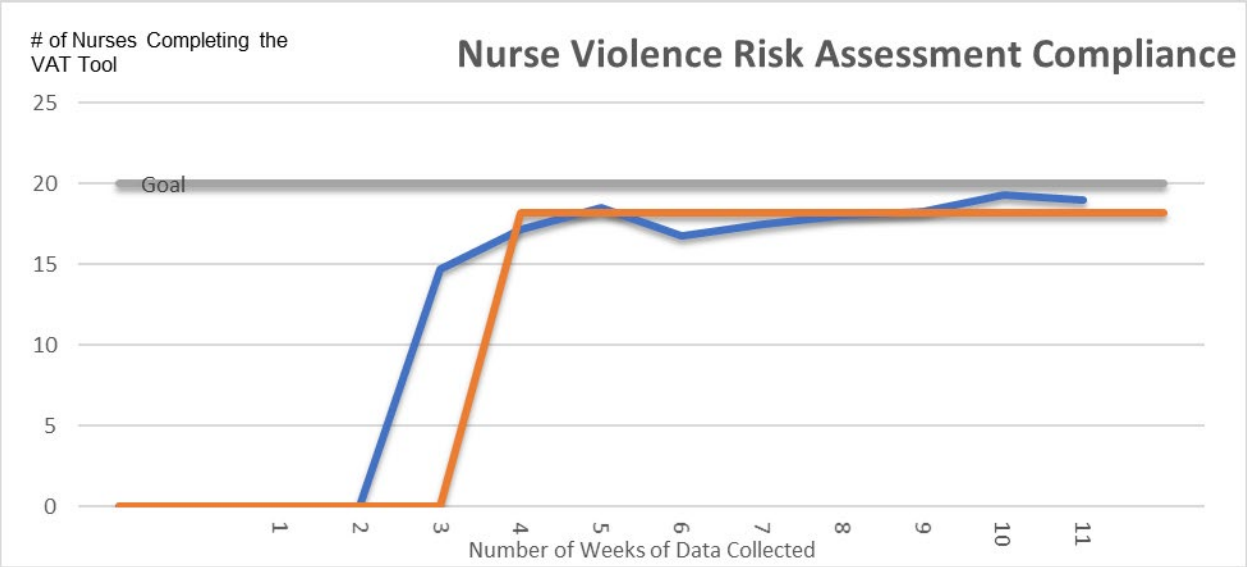
Appendix G: Patient Weekly Audit Compliance Run Chart and Audit Tool



1	0	215	0
2	0	215	0
3	206	215	227
4	178	215	212
5	215	215	226
6	218	215	227
7	221	215	227
8	215	215	226
9	250	215	262
10	232	215	246
11	216	215	225

Compliance Screening Audit Tool			
9-Sep	# of Patients admitted	# of Patients that completed the DASA	% of patients that complete the DASA
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			

Appendix H: Nurse Weekly Audit Compliance Run Chart and Audit Tool



1	0	0	20
2	0	0	20
3	15	0	20
4	17	18.145	20
5	18	18.145	20
6	17	18.145	20
7	17	18.145	20
8	18	18.145	20
9	18	18.145	20
10	19	18.145	20
11	19	18.145	20

Compliance Screening Audit Tool					
9-Sep	# of Nurses on Duty	# of Patients admitted	# of Nurses completing the VAT on every patient	# of Patients completing the DASA	% of nurses completing the VAT
1					
2					
3					
4					
5					