

Adolescent Aggression and Restrictive Interventions

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Abstract

Seclusion and restraint are restrictive interventions that continue to be used in both physical care and mental health care settings as a means of controlling dangerous behavior such as aggression. Restrictive interventions place patients and healthcare staff in hostile situations that can lead to physical, mental, and emotional injuries that can last a lifetime. Unfortunately, restrictive interventions continue to be used in many healthcare organizations around the world and the number of patient and staff injuries continue to rise. Stakeholders at a Phoenix area psychiatric inpatient hospital conducted an internal audit on the number of seclusion and restraint episodes in 2019, which revealed an increase in the number of seclusion and restraints episodes on the adolescent unit. The result of this audit led to the project question: For nurses on an acute adolescent inpatient unit, is a seclusion and restraint education program more effective than usual practice in changing the knowledge and attitude regarding seclusion and restraint? The purpose of this practice change project was to provide staff education that focused on trauma informed care, de-escalation techniques, and therapeutic communication to improve staff confidence to ultimately lead to the reduction of seclusion and restraint use on an adolescent inpatient unit. A pre and posttest questionnaire designed to better understand nurse attitude and knowledge regarding restrictive interventions prior to the education session was provided. A convenience sample of nurses ($N=9$) participated in the project. The findings from the pre and posttest questionnaire suggest that seclusion and restraint education for nurses may improve nurse knowledge and attitude regarding the use of restrictive interventions and reduce rates of use.

Keywords: Adolescent, Aggression, behavior management programs, inpatient, restrictive interventions, restraint, seclusion.

Adolescent Aggression and Restrictive Interventions

The problem of restrictive interventions is a well-documented issue in behavioral health inpatient healthcare organizations. Restrictive interventions have been used to protect the patient and staff from behaviors that are deemed a danger to self, others, or property. Restrictive interventions can range from physical, mechanical, or chemical restraints and include seclusion or segregation from others (SAMSHA, 2011). Restraints are defined as any physical, mechanical, or chemical means of immobilizing or restricting a patient's freedom of movement while seclusion is considered the involuntary confinement of a patient (SAMSHA, 2011). For many decades, restrictive interventions have been used for safety and not as a form of treatment (Lai, 2007). However, these interventions expose patients, as well as staff, to physical and emotional pain, trauma, and injuries. Therefore, the benefits associated with the use of restrictive interventions continue to be heavily debated topic and the question remains; are they truly an effective and therapeutic intervention? (Lai, 2007).

Problem Statement

Seclusion and restraint (S/R) continue to be utilized as a therapeutic intervention around the world throughout various psychiatric settings. Studies have shown that approximately 20% of inpatient psychiatric patients hospitalized worldwide are physically restrained for aggressive behaviors and patients under 12 years old are the most commonly restrained patient (Pazargadi et al., 2013; SMASA, 2012). According to the Crisis Prevention Institute (CPI) and the Substance Abuse and Mental Health Services Administration (SAMHSA), 37.5% of patients under the age of 18 have experienced S/R in one way or another and approximately 50-150 American patients die annually because of S/R. Since the reporting of adverse events associated with S/R was not mandated prior to 1998, the exact number of injuries and deaths associated with S/R is unknown

(General Accounting Office (GAO, 1999). However, since 1999, reporting records and evidence has continuously shown that both patient and staff injuries continue to occur as a result of S/R use (Haimowitz & Urff, 2006; GAO, 1999; Moylan & Cullinan, 2011). Despite these alarming statistics, S/R continue to remain a fixed intervention in the management of hostile and aggressive behaviors (Wynn, Kvalvik, & Hynnekleiv, 2011).

Purpose and Rationale

Restrictive interventions can be detrimental to the health, safety, and recovery of patients with mental health conditions. S/R events can cause physical, mental and emotional injuries that affect patient outcomes. Ensuring good patient outcomes requires identification of evidence-based interventions that are focused on quality of care, patient safety, and prevention of adverse events. Therefore, it is imperative that high quality, evidence-based interventions are developed and implemented into practice. The purpose of this evidence-based practice (EBP) paper is to review past and current literature that identifies the most common behaviors associated with restrictive interventions, to discuss the dangers associated with S/R, and to examine alternative interventions that proactively manage difficult patient behaviors.

Background and Significance

In attempts to minimize the use and dangers associated with S/R, many organizations have implemented practice guidelines and recommend using S/R as a last option for aggressive behaviors. There is evidence to suggest that evidence based therapeutic alternatives for the management of aggressive inpatient behavior is possible. Behavioral modification techniques such as Collaborative Problem Solving (CPS), Cognitive Behavior Modification (CBM), and Management of Aggressive Behavior (MAB) have been shown to be effective the management of difficult behaviors such as aggression (Erocole-Fricke et al., 2016; Price et. Al (2017). Staff

education and training to improve de-escalation techniques, enhance therapeutic communication, and promote recovery focused environment are essential for establishing a restraint free healthcare organization (Delaney, 2006).

According to The Substance Abuse and Mental Health Services Administration (SAMSA), 82% of children and youth have experienced a traumatic event in their lifetime, 41% have had thoughts of suicide, and 23% have attempted suicide in the past (2012). Treatment initiatives such as the national Children's Mental Health Initiative (CMI) focuses on improving mental health care support and treatment for children and youth with emotional or mental disturbances (SAMSA, 2019). Untreated mental issues leave children and youth at an increased risk for substance use and abuse, suicidal ideations, and impulsive decisions that can impact their future (Carr, et al., 2008).

Children and adolescents displaying aggressive behaviors are commonly seen in acute inpatient psychiatric settings. Studies have shown that 60% of all child and adolescent psychiatric hospital referrals are for the assessment and treatment of aggression (Dean et al., 2008; Hage et al., 2009). According to previous research, 40% of adolescent patients have displayed various acts of aggression while inpatient which include verbal hostility, physical assaults, and property damage (Renwick et al., 2016; Barton et al., 2001; Dean et al., 2008). Although aggressive behaviors are the cause for many psychiatric admissions, many patients with aggression will continue to have aggression outbursts throughout their hospital stay. Often, the circumstances surrounding the admission conditions such as unit confinement, length of stay, and lack of patient autonomy increase patient agitation and aggression (Wong et al. 2016; Baeza, 2013). As a result, patients with aggression can be challenging and difficult to treat.

There are several studies that have shown positive effects of managing inpatient aggression with therapeutic techniques based upon other than S/R. For example, a study completed in Canada found that training staff with the Omega Program for the Management of Aggressive Behaviors (OPMA) effectively reduced the frequency and duration of S/R in an inpatient setting and a similar study utilizing OPMA found that posttest qualitative results showed less psychological stress on the patient with an increased level of confidence in using coping skills to control anger after discharge (Geoffrion et al., 2018). Another study by Booker et al., found that training inpatient staff with Occupational Mindfulness (OM) training had helped staff respond more positively and mindfully to patients displaying challenging and aggressive behavior which ultimately lead to a decrease in the use of S/R (2014). Other studies have found that multi-modal approaches based upon the six core strategies have been effective in managing aggressive behaviors and reducing S/R in inpatient settings which include the incorporation of organizational changes, staff training in aggression prevention, collaborative treatment planning with patient involvement, and including aggression risk assessments at admission (Guzman-Parra et al., 2016; Label et al., 2014; Wieman et al., 2014).

Studies have reported patient perceptions and experiencing during the use of S/R. A study completed by Kontio et al. found that patients expressed feeling punished, distressed, and uninformed during the process while others reported that improvements could be made by offering alternatives to S/R and providing more appropriate programming (2012). Other studies have found that patients express feelings of fear, powerlessness, and humiliated during S/R but also report patients expressing feelings of safety if appropriate staff presence, calmness, and explanation were provided during the process (Chien et al.2015; Lanthen, Rask & Sunnqvist, 2015; Price et al.,2016). Studies have also shown that staff perception of S/R include reluctance

in using S/R, however, have little confidence in alternative measures that are effective in controlling aggressive behavior but also report feeling that increased use of S/R is associated with undertrained staff members in de-escalation techniques as well as inadequate staff to patient ratios (McCann et al. 2014; Mohler & Meyer, 2014). Furthermore, a study by Pazargadi et al. found that patients and nurses contribute to a negative nurse-patient relationship and consider this as a barrier to the reduction of aggression and that education to improve relationships would be beneficial for optimal patient outcomes (2015).

Usual care in psychiatric settings consist of various forms of crisis prevention techniques that include annual training and refresher courses that teach psychiatric staff how to safely execute S/R. For example, programs such as the Crisis Prevention Institute (CPI) have been implemented in various settings as a means of training staff on nonviolent crisis interventions (2016). CPI teaches de-escalation skills as part of an 8-hour training which also instructs staff how to safely administer S/R in emergency and psychiatric settings (CPI, 2016). Given that this is a one day, 8-hour annual training, many staff are not adequately trained to de-escalate or therapeutically communicate with agitated patients (Guzman-Parra et al., 2016; LeBel et al., 2014). In order to effectively manage acute aggression, there must be more frequent training programs for evidence-based aggression management techniques that help staff members appropriate manage aggressive patients and reduce the use of S/R for better patient outcomes.

Overall, important themes in the given literature describe R/S as a dangerous intervention for management of aggression that affects both patients and staff members. Staff and patient injuries, including death, are significant adverse events related to S/R that can be significantly reduced and even eliminated by the incorporation of multi-modal evidence-based aggression management programs in inpatient settings. Themes in recent research have shown that the

combination of various therapeutic interventions and techniques have made effective multi-modal aggression programs successful in reducing aggression and decreasing the utilization of S/R. Therefore, it is imperative to continue research on this topic and discover innovative strategies to safely and effectively manage patient aggression to reduce and eliminate S/R while providing better patient experiences and improved patient outcomes.

Internal Evidence

Stakeholders at a local Arizona hospital have been looking at staffing shortages, staff injuries, and more specifically, the relationship between patient acuity and patient aggression. Stakeholders have been monitoring the number of incident reports, staff injuries, and work injury claims in correlation with the increasing number of physical restraints that have been occurring on the adolescent inpatient units. The internal evidence suggests that there is an increase in the number of physical restraints occurring and stakeholders are seeking solutions to reduce the number of physical restraints on the adolescent units

There are many treatment considerations when working with children. Providers must work together to improve mental health outcomes. It is important to screen children and adolescents for mental health conditions, specifically aggression prior to admission to an acute inpatient setting. Being aware of possible dangers associated with patient aggression can help prevent and protect patients and staff from unnecessary injuries and use of restraints (Berring, Pederson & Buus, 2016). Utilizing innovative and evidence-based aggression management programming on an adolescent unit can improve the therapeutic milieu while teaching skills that can be applied in the community for better patient outcomes. Therefore, the concern related to increased use of restraints as a result of adolescent aggression in an inpatient setting has led to the PICOT question: For nurses on an acute adolescent inpatient unit, is a seclusion and restraint

education program more effective than usual practice in changing the knowledge and attitude regarding seclusion and restraint?

Sources and Search Strategy

An exhaustive search was conducted in three different electronic academic data databases that included the PubMed database, ProQuest Psych Info Database, and EBSCOhost CINAHL search database. Key words used to search each database included adolescents, aggression, mental health inpatient, restraint, seclusion, de-escalating techniques, improved outcomes, interventions, and behavior management strategies. These terms were search in various combinations and individually with limiters of full text, English language, peer reviewed, research articles. The search modes utilized included MESH terms with Boolean connectors and word-controlled vocabulary.

PubMed search results initially revealed 1547 articles when searching for adolescent, mental health, and aggression. When narrowed and sorted for best match with the term's adolescent aggression, interventions the final number of articles yielded was 44 articles. Upon searching the combined terms adolescent and restraint and inpatient, Psych Info produced 282 articles. Upon narrowing the search to combine adolescent, restraint, inpatient, and behavior management, 35 articles remained and were included in the final article count.

The initial EBSCOhost CINAHL search query results included 590 articles when searching the terms adolescent, hospitalization, aggression, and behavior management strategies. The final search terms restraints or physical restraints combined with adolescents or teenagers or young adults, and inpatients, hospitalization, or hospitalized patients produced 70 article results for the final search. Grey literature for restraint statistics and guidelines was collected from The

Joint Commission on Quality and Safety, The Centers for Medicaid and Medicare Services, and The Substance Abuse and Mental Health Services Administration websites.

Critical Appraisal and Synthesis

The Melnyk and Fineout-Overholt's (2011) rapid critical appraisal (RCA) tool was used to evaluate and select the 10 articles for the literature review (Appendix A). The selected articles selected were of high-level evidence with most of the articles being randomized control trials (RTC) (Appendix A). The additional articles included one pilot study, one quality improvement study, and one quantitative study (Appendix A). The remaining two articles were qualitative studies (Appendix A). Only one article did not report their funding source and the majority were funded by national research institutes around the world. Singh et al. (2016) was the only study to declare a bias since the intervention was developed by one of the article's author's; however, the author's declared that the study was not funded and completed without any financial or commercial relationships that put the study at risk for any conflict of interest (Appendix A).

All studies had appropriate samples sizes according to the study type. Pazargadi et al. (2015) was the only study with a relatively small sample size, however, it was appropriate and adequate given the fact that it was a qualitative study with purposive sampling (Appendix A). Eight of the studies were conducted in a psychiatric inpatient unit in a community-based psychiatric hospital setting with focus on interventions to prevent or reduce seclusion and restraint use. Two studies were conducted outside of a psychiatric inpatient unit. Franco et al. (2016) completed their study in a public high school setting and Testad et al. (2015) completed their study in a nursing home setting; however, both studies focused on interventions to prevent and reduce seclusion and restraint use (Appendix A).

There was a significant homogeneity found between the 10 studies. Most of the studies were inclusive of adults, both men and women, diagnosed with psychiatric conditions while admitted to psychiatric inpatient settings. Testad et al. (2015) was the only study to focus on the geriatric population diagnosed without a psychiatric condition; however, the study remains applicable because the patient behaviors associated with dementia are like those with psychiatric conditions and often require behavior management interventions (Appendix A). There was also significant homogeneity found between study outcomes in which ten out of ten studies found their interventions to be successful in decreasing the use of S/R in sample populations. As the homogeneity shows a significant effect on the decreased rate in the use of restrictive measures, it is also important to recognize the significance of heterogeneity observed in the measurement tools and intervention designs.

Eight out of ten of the studies used different measurement tools and types of interventions to arrive at the same outcome; a decrease in the use of restrictive measures. The qualitative studies by Price et al. (2017) and Pazargai et al. (2015) were the only studies to use semi-structured interviews as measurement tools (Appendix A). Despite the heterogeneity of measurement tools and interventions, many commonalities exist between each study. For example, they all focus on various forms of staff and caregiver education, training, and behavior management techniques. Additionally, the important theme found across all studies was the focused on aggressive behavior. Therefore, it is possible to assume that that the proactive assessment and prediction of these behaviors contributed to the reduction of seclusion and restraint use in each study.

Conclusion of Evidence Synthesis

The outcome of the literature review provided substantial evidence that the management of aggression and agitation can be effectively managed without the use of seclusion and restraint. Not only did every study show that noninvasive behavior management of aggression is possible but also provided additional evidence showing that effective behavior management can also reduce the use of emergency medication administration, decrease patient and staff injuries, and reduce staff turnover. While every study used a different interventional approach, all studies effectively demonstrated that noninvasive and less restrictive behavior management approaches are effective, regardless of the population or setting. This evidence provides valuable information that can be used to implement practice change at many different levels within the current healthcare system and it can aid in the improvement of patient health outcomes.

Theoretical Framework

The theoretical framework for this project was the Theory of Planned Behavior (TPB). The TPB approach links an individual's beliefs and attitudes with behavior. The theory proposes that human behavior is influenced by behavioral beliefs, normative beliefs, and control beliefs (Ajzen, 2019). According to this theory, behavioral beliefs impact an individual's favorable or unfavorable attitude towards a given behavior, normative beliefs are the social pressures to perform a behavior, and the control beliefs are agents that facilitate or impeded performance of the given behavior (Ajzen, 2019). The assumption is that the more favorable the attitude is, combined with significant increase in social influence and perceived behavior control, the greater the intent will be to perform a given action (Ajzen, 2019). This assumption will then result in the expectation that a person will execute the intended behavior when the opportunity arises. This theory was an effective framework for the proposed study since the study measured staff

attitudes and beliefs associated with the use of restrictive interventions in an inpatient psychiatric unit.

Implementation Framework

The PRECEED-PROCEED model guided this project. This model provided a comprehensive model for both assessing health needs while designing and implementing interventions that influence positive health outcomes (Crosby & Noar, 2011). The PRECEDE framework begins by focusing on the development of a behavioral diagnosis of a social problem before the development of the intervention plan. This includes determination of the severity of health issue at hand, the behaviors of the individuals who directly affect the patients at risk, and the actions of those that impact the individuals at risk (Crosby & Noar, 2011). Once this is established, specific and effective interventions can then be identified to assist with changing the problem at hand. The PROCEED area of this model includes implementation of the intervention chosen and outcome evaluation can be measured (Crosby & Noar, 2011). This theoretical framework aligned with the project since the undesired behavior was identified as the increase use of seclusion and restraint practices by inpatient staff. Once established, the intervention and goal to decrease the use of restrictive measures was determined. This includes an educational presentation regarding the risks, dangers, and trauma associated with behavior containment methods, such as seclusion and restraint, and effective de-escalation techniques for difficult patient behavior. The project facilitator administered a pre and post questionnaire to evaluate and compare staff attitudes and knowledge towards managing disturbed psychiatric patients before and after the educational presentation.

Methods

This project was approved by the institutional review board at Arizona State University. It was conducted with nurses working on an adolescent acute inpatient unit at a suburban behavioral health hospital in the southwest region of the United States. Nurses were English speaking, over 18 years of age, able to attend education sessions, and completed 2 project questionnaires. Exclusions included anyone that was not a nurse, or the primary unit was not the adolescent inpatient unit. The adolescent unit supervisor informed nurses at a staff meeting of the project and provided a sign-up sheet that was posted in the staff break room for willing participants to sign up for the project. A flyer was also posted in the staff break room with project information and contact information for questions or concerns. The Co-PI contacted the willing participants to arrange a time to complete the questionnaires. All questions were answered during this time and all participants agreed to participate in the project without credit or any compensation for participation. Participants were asked to complete a consent form that contained a unique ID consisting of the last two digits of their birth year and the two digits of their birth month to compare pre and post intervention questionnaire data. The consent was provided immediately prior to the completion of the prequestionnaire and participants signed and dated their consent forms.

The participant educational session was approximately 30 minutes long and was developed and performed by the CO-PI under the PI. The information during the education session included background information regarding the use of seclusion and restraints, definitions, level of current knowledge, and indications for use as well as policy, initiatives, and dangers associated with use of restrictive intervention practices. Two weeks after the education session, participants were given a post intervention questionnaire. The data collection period lasted 1 month and there was no long term follow up required. The consent forms and both pre

and post intervention questionnaires were locked in a separate file cabinet for safe keeping. Results were stored until May 2020 after the results were analyzed and the study was completed. Intellecus Statistical Analysis Software was used to store, manage, and analyze the data. Descriptive statistics were used to describe the sample and outcome variable. To evaluate the pre-intervention and post-intervention responses, a paired sample t-test was used to analyze data and identify any increase in knowledge and change in attitude towards S/R practices.

Participants that became psychologically upset after learning the dangers associated with S/R or those that may not have agreed with the education provided were instructed to contact their unit supervisor or employee assistance program (EAP) for psychological assistance. The results of this project contributed to the improvement in patient outcomes in the acute adolescent mental health treatment approach to treatment. By educating staff on the way care is delivered it helped reduce the need for restrictive interventions. There was limited foreseeable risks associated with this project. There was no outside funding provided for this project and the project budget was completed with the COPI as the main funding source.

Outcome Measurements

The Nurse Knowledge and Attitude Questionnaire (NKAQ) is a forty question, 4-part questionnaire that was used to assess nurse baseline knowledge and attitudes related to the use of seclusion and restraint practices (Kahlil, 2017). Permission from the creator of NKAQ was obtained for the use of this instrument. The NKAQ included demographic questions that include gender, age, ethnicity, and educational and work experience. The second part was comprised of 15 questions regarding S/R definitions, purposes, indications, as well as ethical issues, nursing care for restrained patient, and alternative interventions. Correct responses were

given a score of 1 and incorrect responses were given a score of 0, with 'undecided' answers included in the incorrect category with a potential scoring range of 0–15 (Kahlil, 2017).

The third part contained 11 questions to measure nurse attitudes towards S/R. Using a 3-point Likert scale, each item was given a score of 3 for agree, 1 for disagree, and vice versa for negatively phrased items (Kahlil, 2017). High scores were reflective of favorable and positive attitudes towards S/R while low scores were reflective of negative attitudes. The score range for this section was 11-33.

The fourth part consisted of 14 questions that assessed nursing practice regarding S/R. This section addressed alternative interventions prior to S/R use, indications for S/R, physician order and documentation requirements, and staffing levels contributing to the increased use of S/R practices (Kahlil, 2017). Participants were asked to respond to each of the items on a 3-point Likert Scale about whether they always, sometimes, or never performed these practices. Most items were reflective of more favorable practices towards caring for restrained patients, with scores of 3 for always to 1 for never having adopted such practices (Kahlil, 2017). The negative item was reverse-scored. Therefore, a score of 14 indicated the most undesirable practice while 42 indicated the best practice in use of restraints (Kahlil, 2017).

Results

The average score for the post test results showed that trauma informed education increased nurse S/R knowledge and change attitudes about restrictive interventions. This is clinically significant as this may help decrease future use of S/R practices on the adolescent inpatient unit while helping to create an organizational culture change that is supportive of a restraint free environment. However, in order to sustain change and reduce S/R practices, ongoing trauma informed education sessions focusing on de-escalation techniques, therapeutic

communication, and alternative interventions should be implemented and continuously evaluated for effectiveness. This will help not only improve patient care and health outcomes, but it will decrease staff and patient injuries, save the health care system unnecessary costs, and help contribute to finding effective alternatives. These positive outcomes can then be used to advocate for policy implementation to regulate and eventually eliminate restrictive interventions.

Discussion

Implementation of evidence-based interventions designed to reduce aggression, agitation, and other dangerous behaviors of adolescent patients admitted to psychiatric inpatient unit would have a significant impact on patient care, staff satisfaction, and healthcare outcomes around the world. The development of nurse education programs focused on trauma informed care, therapeutic communication, and de-escalation techniques may significantly decrease the rate of adverse events associated with seclusion, restraint, and other restrictive measures. The incorporation of trauma informed educational programs may also help change the organizational culture to a more therapeutic, supportive, and humanistic approach to treatment. Therefore, it is important to establish an effective program that is designed to decrease patient agitation, aggression, and other dangerous behaviors to decrease the use of restrictive measures that place patients and staff in dangerous situations. Projects such as this help aid in the search to find innovative, evidence-based interventions that are safe and effective.

Current practice in the management of aggression in the mental health setting continues to result in the use of restrictive measures. This not only places patients and staff in dangerous situations but it results in poor patient care and high staff turnover rates. By implementing programs such as nurse education sessions designed to increase knowledge and change attitudes towards S/R with help prevent injuries, improve patient care, and enhance mental health

treatment. Implementation of this project will help contribute to the efforts in finding alternative evidence-based interventions that aid in the overall improvement of patient outcomes. However, implementing projects in search of evidence-based alternatives is not always easy.

There were two barriers encountered during the implementation of this project. The first barrier occurred during the post testing period when the organization had switch restraint training companies. This required all staff to attend a one day, eight-hour training that included education on S/R practices, de-escalation techniques, and therapeutic communication. This may have impacted the project outcomes since nurses received additional education during the implementation phase of this project. The second barrier to this project was that the project site implemented an auto accept process for accepting patients without a chart review. This may have impacted the project since more difficult and aggressive patients were being admitted to the adolescent inpatient which resulted in an increase in S/R practices. The challenges associated to this project were unique and not found in any other literature review results. Therefore, projects targeting nurse education, therapeutic communication, and de-escalation techniques should continue to be developed, implemented, and evaluated throughout various settings to identifying safe alternatives, improve patient outcomes, and advocate for policy regulation on S/R practices.

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Appendix A

Table 1

Evaluation Table

Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
Bowers et al., (2015) Reducing conflict and containment rates on acute psychiatric wards: The Safewards cluster randomized controlled trial. Country: United Kingdom Funding: National Institute of Health Research. Bias: None declared	Inferred Behaviorist Theory	Design: A Pragmatic randomized controlled trial. Purpose: To reduce conflict on IPU through interventions that could enhance staff modifiers.	N: 15 hospitals N: 31 IPU n: 9 NHS Setting: PIU in London Demographics: Inclusion: IPU for adults of any gender, willing healthcare professionals. Mean Age: 33.7 Female: 59.4% Exclusion: If specialty unit, planned major unit changes, no unit manager, >30% nursing vacancy rate. Attrition: 0	IV: Safewards Intervention training Package IV Def: 10 various behavior interventions DV1: Conflict DV2: Containment events	PCC Patient-staff Conflict Checklist (PCC)- total conflict and rates of total containment (APDQ) Attitude to Personality Disorder Questionnaire Self-harm Antipathy scale Ward Atmosphere Scale	Poisson hurdle mixed model.	DV1: reduced the rate of conflict events by 15.0% (95% CI 5.6–23.7%). P=0.001 Control (95% CI 5.6–23.7%) relative to the control intervention. by 26.4% (95% CI 9.9–34.3%) DV2: 26.4% (95% CI 9.9–34.3%). P=0.001 ES: .54 = Large	LOE: 2 Strengths: Large population size, advanced registration, independent randomization, independent and blinded statistical analysis. Weakness: Limited to general IPU, different staff qualifications, and education levels. Conclusions: The rate of containment events for the experimental intervention was reduced the experimental condition reduced the rate of conflict events by 15%. Feasibility: This intervention can be used in further testing with different populations and settings.

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
Blair et al. (2016). Reduction of seclusion and restraint in an inpatient psychiatric setting: A pilot study. Country: USA Funding: Burlingame Center for Psychiatric Research and Education, The Institute of Living, Hartford Hospital, Bias: None declared	Inferred: Theory of Planned Behavior	Design: Pilot study Purpose: a quality and safety initiative designed to decrease seclusion/restraint (S/R)	N: 120 n: 3884 Setting: PIU Attrition: None Demographics: B 12 years old, 85.9 % 13–65 and 9.2 % C 66; 49.7 % of patients were female and 50.3 % male; race distribution was 15.9 % black, 23.9 % Spanish/Hispanic, 56.3 % white, and 3.9 % other. (n = 8029) was 5.0 % B 12 years old, 87.2 % 13–65 and 7.8 % C 66; 48.5 % of patients were female and 51.5 % male; race distribution was 16.5 %	IV: Risk Connections training DV1: violence/aggression DV2: Restraint DV3: Seclusion BVC: Brøset Violence Checklist	BVC Checklist instrument	Chi-Square T-test	DV1: BVC 2.58 score (high risk aggression/violence) DV2: Rates of restraint events decreased 6 % (non-significantly, p = 0.44): baseline 213/3884 = 5.5/100 admissions, study period 412/8029 = 5.1/100 (p < 0.01). DV3: study period 213/8029 = 4.4/100 admissions vs. baseline 358/3884 = 9.2/100 admissions, p 0.01), a 52 % reduction ES: Small .10	LOE: 3 Strengths: Large sample size, numerous variables. Weaknesses: One hospital used. Small effect size Conclusions: Intervention was effective in reducing use of S/R events and duration time. Feasibility: This pilot study can be used in a variety of settings and in an adolescent unit to reduce S/R.

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/Theme	Decision for Use
			black, 23.6 % Spanish/Hispanic, 55.3 % white, and 4.6 % other					
Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/Theme	Decision for Use
Pazargadi et al. (2015). The therapeutic relationship in the shadow: Nurses' experiences of barriers to the nurse-patient relationship in the psychiatric ward. Country: South Iran Funding: Deputy of Research Affairs of Ahvaz Jundishapu	Inferred Peplau's Theory of Interpersonal Relationship	Design: Descriptive Qualitative content-analysis study. Method: semi-structured. Purpose: To investigate the psychiatric nurses' experiences of using physical restraint in the psychiatric wards of Ahvaz hospitals, southern Iran.	Purposive sampling method N – 14 Age Ra: 25-52 M: 38.5 EPN Ra: 7 months-26 yrs. EL: BSN 13, MSN - 1k Setting: PIU TF: 2012-2013 Inclusion: 1. EL – B 2. YP > 6 3. AP – Y Exclusion: unlisted Attrition: None	IV: Nurse -Pts experience DV1: NPB DV2: PRB DV3: OBR	Semi-structured inpatient interviews recordings	Inductive content analysis	Theme 1: NPB affected by NPC, WE, NA Theme 2: PRB affected by LOK, FCO Theme 3: OBR affected by WO, LNP, MPS Findings: TR is neglected and in the shadows of care.	LOE: 4 Strengths: Qualitative design Strong themes to improve NPR. Weaknesses: No discussion of attrition rate, amount of hospitals not discussed, gender not discussed. Conclusions: NPR can be improved by focusing on NPB, PRB, and OBR. Feasibility: Results add elements and characteristics for improving NPR.

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
r University of Medical Sciences South Iran Bias: None Declared								
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
Price et al. (2017) Patient perspective s on barriers and enablers to the use and effectiveness of de-escalation techniques for the management of violence and aggression in mental health settings.	Theory of Planned Behavior	Design: Descriptive Qualitative Purpose: To investigate PP on staff, pts, and EI on use and effectiveness of DT.	N: 26 n : 7 PIU Age: 18-30: N =8 31-43: N = 11 44-60: N = 6 61+: N = 1 Female Gender: N = 18 (69%) Male Gender: N = 8 (31%) RP: PR N = 17 (65%) IMM: N = 11 (42%) S: N = 9 (34%) PRNM: N = 19 (73%)	IV1: Staff IV2: Pts IV3: Environment DT: verbal or non-verbal skills to reduce A without RP: Seclusion, PR, PH, medication	Semi structured, inpatient interviews; digitally recorded, transcribed verbatim by SUR.	Framework Analysis	Theme 1: Underuse of DT attributed to LSR Theme 2: Need to retain CD over pts. Theme 3: PIU rules, lack of pts respect and pts factors reduced DT effectiveness. Findings: RP, rather than DT, are used in response to EPB.	LOE: 4 Conclusions: Results and findings provide indicators of OBC targets for interventions seeking to reduce violence and RP through DT. Strengths: detailed N, thorough discussion of themes and findings. Weaknesses: Pts with only EB, RP were included. Sampling limited to PIU pts. Only. Feasibility: Findings be utilized to improve DT and improve patient outcomes across all settings and populations of patients.

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
<p>Country: United Kingdom Funding: The National Institute of Health Research, Doctoral Research Fellowship Program Bias: None Declared</p>			<p>Time out: N = 17 (65%) IO: N = 17 (65%) None: N = 2 (7%) IL: 3 min-1 hr:50 min IL M: 33 min Demographics: Setting: PIU TF: 2014 Inclusion: PIU admission within 2014; involvement in EB with staff intervention. Informed Consent; English speaking Exclusion: Pts without EB pr RP Attrition: None</p>					
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use

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Putkonen et al. (2013) Cluster-randomized controlled trial of reducing seclusion and restraint in secured care of men with schizophrenia Country: Finland Funding: National Institutes of Health and Welfare and Finnish Ministry of Health Bias: None Declared	Inferred to the Cognitive Behavioral Model	Design: Randomized controlled trial study Purpose: To study if RP could be prevented in schizophrenic pts.	N: 88 n: 13 PIU Setting: State run secured hospital on IPU in Finland Diagnosis: Schizophrenia Time: 6 months Only males N = 88 Mean Age: 40.2 Inclusion: Schizophrenia diagnosis, highest risk for violence, IPU admission, None	IV1: Six Core Strategies DV1: S/R outcome	IRR: Monthly incidence rate rations.	Poisson's Regression Analysis	DV1: S/R reduced by 30% to 15% for intervention IPU CI: = .86-.90, p<.001 IRR = .88, 95% while control IPU was 25%-19% IRR = .97, CI = .93-1.01, p = .056. The difference between the groups was significant (p=.001), S/R: Time decreased from 110 to 56 hours per 100 days of intervention IRR = 1.09, CI: = .94-1.25, p = .24.	LOE: 2 Strengths: First RTC study completed on the reduction of S and R use. Weaknesses: Short duration for the study, unknown what DT impacted the study outcomes that are already practiced. Attrition and exclusion were not discussed. Conclusions: S/R were prevented with 6 core strategies intervention. The proportion of patient-days with seclusion, restraint, or room observation declined from 30% to 15% for intervention wards Feasibility: This study can be used in both extreme PIU settings as well as less extreme circumstances for improved patient outcomes and less RP.
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use
Ercole-Fricke et al. (2016)	Piaget's Theory of Cognitive	Design: Quantitative, comparative,	N: 564 n: 242 Pre-implementation	IV: CPS DV1: Restraints DV2: self-harm	Collaborative problem-solvin g (CPS) model.	Chi-Square Analysis,	DV1 t(40)=1.58(p = .122),	LOE: 2 Strengths: Long length of study

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Effects of a collaborative problem-solving approach on an inpatient adolescent psychiatric unit. Country: USA Funding: Private Grants from UNICO foundation and Island Outreach Foundation Bias: None Declared	Development	quasi-experimental Purpose: To evaluate the effectiveness of CPS on patient behavior outcomes of adolescents with mental health conditions.	n: 322 Postimplementation Setting: PIU Years: 2008-2012 Demographics: Male: 161 Female: 375 Inclusion: Age 12-17, not limited by gender, age, diagnosis, physical capabilities, other than inpatient psychiatric care Exclusion: None Attrition: Not reported	DV3: Length of stay DV 4: Security calls	Staff surveys hospital medical records	Independent T tests	DV2 self-inflicted injury t(131)=5.21 (<i>p</i> = .001) DV3 length of stay t (98) =1.58 (<i>p</i> = .001), DV4 T (98)=9.00 SD 3.29 (<i>p</i> = .001) Effect Size: Large	Weaknesses: Limited demographics Conclusions: CPS was shown to be effective in substantial reduction of restraint. Feasibility: The study identified elements that can be utilized across the continuum of adolescent care, not only in hospital but also in school and community environments.
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use
Franco et al. (2016) Effect of a mindfulness training	Inferred Orem's Model of Nursing	Design: A randomized controlled trial Purpose: To analyze the	N: 27 n: 14 CG n: 13 EG Setting:	IV1: EP (FMT) DV1: Aggression DV2: Impulsivity	1.The Barratt Impulsivity Scale (BIS)	Mann-Whitney U Cohen's d	DV1: Z=3.94; p=0.005 d=1.16 (13.69) DV2: Z=3.68; p=0.008 (<i>p</i> <	LOE: 2 Strengths: adolescent focused, RTC Weaknesses: Small sample size

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
<p>Program on the impulsivity and aggression levels of adolescents with behavioral problems in the classroom. Country: Spain Funding: National R+D Plan of the Ministry of Economy and Finance Bias: None Declared</p>		<p>effects of a mindfulness training psycho-educative program on impulsivity and aggression levels in a sample of high school students.</p>	<p>A public high school center located in the province of Granada Demographics: 59% of the participants were boys and 41% girls. The control group was made up of 14 individuals (57% boys and 43% girls), while the 13 individuals remaining were sent to the experimental group (62% boys and 38% girls). Inclusion: In school Exclusion: None Attrition: None</p>	<p>Fluir Meditation Technique (FMT): Mindfulness intervention</p>	<p>Cronbach's alpha= 0.77 to 0.92. 2. Aggression Questionnaire (AQ) Cronbach's alpha= 0.72 to 0.85.</p>		<p>0.01; d=0.679 (16.16%) Cohen's d: >1.5 Effect Size: Moderate</p>	<p>Conclusions: Reduction of impulsivity and aggression noted with this study. Feasibility: This study can be used in multiple settings for effectiveness reducing S/R</p>
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use

Key: A - adolescents, AG - agitation, AGG - aggression, AP - Agreement to participate, B - bachelor, B - boys, BI - behavioral indicators, BSN- bachelor degree in nursing, CCD - comprehensive care delivery, CD - control and dominance, CE - coercive interventions, CD - communicative process, D- de-escalation, DI - duration of intervention, DQ- delinquent behavior, DT - de-escalation techniques, E - environmental EB - escalating behavior, EBT - evidence based treatments, EI - Environmental Influences EL - education level, EPB - escalating patient behavior, EPN - years in psychiatric nursing, ES - effect size, FAC - factors affecting connections, FCO - failure to communicate with others, FMHC - finnish mental health act, G - girl, SI - inpatient, ICS- insufficient communication skills, IL - interview length, IMM - intramuscular injectable medication, IO - increased observation, IP - interpersonal process, ITP - individual treatment plans, LNP- large number of pts, LOK - lack of knowledge, LSRC- lack of staff respect for culture, M - mean, Mdn - median, Mo - mode, MPS - manpower shortage, MSN - masters education in nursing, N - no, N - population size, n - sample size, NA- negative attitude, NC - # of pts in control group, NI - # of pts in intervention group, NPB - nurse patient barriers, NPC - negative personal characteristics, NPR - nurse patient relationship, NPR - nurse patient relationship, NRV - nurse related variables, OBC - organizational behavior change, OBP - organizational barriers to relationship between nurse and pts, ORV - organizational variables, P - psychopathological, PH - physical hold, PIU - psychiatric inpatient unit, PMT - parent management training, PPB - patient perspective barriers, PPE - patient perspective enablers, PR - physical restraint, PRB - patient related variables, PRNM - PRN medication, PRU - patterns of restraint use, Pts- patients, PV - physical violence, PW - psychiatric ward, R - restraint, Ra -Range, RP - restrictive practices, RRI - restraint reduction initiatives, RU - restraint utilization, S - seclusion, SD - standard deviation, SUR - service user researcher , TF - time frame, TR - therapeutic relationship, WE - work exhaustion, WO- work overload, Y - yes

Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
Makki, et al., (2018). Implementation of an ACT curriculum on an adolescent inpatient Psychiatric Unit: A Quality Improvement Project. Country: USA Funding: Patient Centered Outcomes Research Institute and HRSA. Health Resources and Bias: None	The Neuman systems model	Design: Quality Improvement Study Naturalistic Study Purpose: The measure changes in parent/patient knowledge and satisfaction with group programming and changes on the Avoidance and Fusion Questionnaire for Youth (AFQ-Y);	N = 184 Male=29 Female= 68 Age M = 15.47 Length of Stay M= 9.2 Setting: PIU	IV: ACT DV1: behavior	The Avoidance and Fusion Questionnaire for Youth (AFQ-Y) AFQ-Y8 demonstrated good internal consistency with Cronbach's alpha ranging from .90 to .93 ACT=Acceptance and Commitment Therapy:	SPSS Paired sample T-test	D1: 2.51 (4.4) T = 6.054, DF 183, P < .001).	LOE: 3 Strengths: provided evidence-based practice results Weaknesses: Small Sample Size Conclusions: The project demonstrates that it is possible to implement an evidence-based intervention and create a positive impact during brief inpatient treatment. There was an interaction effect between the amount of programming and improvement Feasibility: This project demonstrated that it is feasible to implement evidence-based programming on a short-term adolescent psychiatric unit
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use

Key: A - adolescents, AG - agitation, AGG - aggression, AP - Agreement to participate, B - bachelor, B - boys, BI - behavioral indicators, BSN- bachelor degree in nursing, CCD - comprehensive care delivery, CD - control and dominance, CE - coercive interventions, CD - communicative process, D- de-escalation, DI - duration of intervention, DQ- delinquent behavior, DT - de-escalation techniques, E - environmental EB - escalating behavior, EBT - evidence based treatments, EI - Environmental Influences EL - education level, EPB - escalating patient behavior, EPN - years in psychiatric nursing, ES - effect size, FAC - factors affecting connections, FCO - failure to communicate with others, FMHC - Finnish mental health act, G - girl, SI - inpatient, ICS- insufficient communication skills, IL - interview length, IMM - intramuscular injectable medication, IO - increased observation, IP - interpersonal process, ITP - individual treatment plans, LNP- large number of pts, LOK - lack of knowledge, LSRC- lack of staff respect for culture, M - mean, Mdn - median, Mo - mode, MPS - manpower shortage, MSN - masters education in nursing, N - no, N - population size, n - sample size, NA- negative attitude, NC - # of pts in control group, NI - # of pts in intervention group, NPB - nurse patient barriers, NPC - negative personal characteristics, NPR - nurse patient relationship, NPR - nurse patient relationship, NRV - nurse related variables, OBC - organizational behavior change, OBP - organizational barriers to relationship between nurse and pts, ORV - organizational variables, P - psychopathological, PH - physical hold, PIU - psychiatric inpatient unit, PMT - parent management training, PPB - patient perspective barriers, PPE - patient perspective enablers, PR - physical restraint, PRB - patient related variables, PRNM - PRN medication, PRU - patterns of restraint use, Pts- patients, PV - physical violence, PW - psychiatric ward, R - restraint, Ra -Range, RP - restrictive practices, RRI - restraint reduction initiatives, RU - restraint utilization, S - seclusion, SD - standard deviation, SUR - service user researcher, TF - time frame, TR - therapeutic relationship, WE - work exhaustion, WO- work overload, Y - yes

Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
Singh et al., (2016) Effectiveness of caregiver training in mindfulness-based positive behavior support (MBPBS) vs. training-as-Usual (TAU): A randomized controlled trial. Country: USA Funding: None Bias: 1 author is the developer of the MBPBS program.	Inferred Interpersonal Theory	Design: A randomized controlled trial (RCT) Purpose: The study was to evaluate in a randomized controlled trial (RCT) the comparative effectiveness of Mindfulness-Based Positive Behavior Support (MBPBS) and Training-as-Usual (TAU) for caregivers in a congregate care facility for individuals with severe and profound IDD.	N: 77 Caregivers N: 48 patients Setting: large congregate care facility for individuals with physical aggression, property destruction, pica, rumination, stereotypy. Inclusion: full-time employment, consent to participate in the training, and availability during the training Exclusion: Not meeting inclusion Attrition: 30	IV1: CG Training IV2: DV1: Aggressive Events DV2: Physical restraints Stat medicine One-to-one staffing Staff stress Staff turnover Cost effectiveness data	(MBPBS) Mindfulness-Based Positive Behavior Support (TAU) Training-As-Usual The TAU trainer	Chi-Square and Independent Samples <i>t</i> -test (all <i>p</i> 's > 0.05)	Findings: - MBPBS training (<i>M</i> 14.00, <i>SD</i> 3.31) to the 40-weeks during post- MBPBS training (<i>M</i> 2.00, <i>SD</i> 2.53), <i>t</i> (39) – 18.20, <i>p</i> < 0.001 (Cohen's <i>d</i> 5.83). Weekly injuries to staff decreased -MBPBS training (<i>M</i> 3.00, <i>SD</i> 2.61) and post-MBPBS training (<i>M</i> 1.00, <i>SD</i> 1.06), <i>t</i> (39) – 7.44, <i>p</i> < 0.001 (Cohen's <i>d</i> 2.38). In addition, the change in weekly peer injuries from pre-MBPBS training (<i>M</i> 5.00, <i>SD</i> 3.14) to post-MBPBS training (<i>M</i> 1.00, <i>SD</i> 1.39) was statistically significant, <i>t</i> (39)	LOE: 2 Weaknesses: Unknown equivalence of the training in each of the two conditions; need to be assessed in different care settings, such as institutions, group homes, family homes, and within the larger community settings. Strengths: the cost effectiveness; large sample. Conclusions: MBPBS may provide an effective means of enhancing socially acceptable bidirectional engagement of caregivers and care recipients within a person-centered context. Feasibility: MBPBS may be a viable approach to nurse training to improve the psychological well-being of both nurses and the care recipients.

Key: A - adolescents, AG - agitation, AGG - aggression, AP - Agreement to participate, B - bachelor, B - boys, BI - behavioral indicators, BSN- bachelor degree in nursing, CCD - comprehensive care delivery, CD - control and dominance, CE - coercive interventions, CD - communicative process, D- de-escalation, DQ- delinquent behavior, DT - de-escalation techniques, E - environmental EB - escalating behavior, EBT - evidence based treatments, EI - Environmental Influences EL - education level, EPB - escalating patient behavior, EPN - years in psychiatric nursing, ES - effect size, FAC - factors affecting connections, FCO - failure to communicate with others, FMHC - Finnish mental health act, G - girl, SI - inpatient, ICS- insufficient communication skills, IL - interview length, IMM - intramuscular injectable medication, IO - increased observation, IP - interpersonal process, ITP - individual treatment plans, LNP- large number of pts, LOK - lack of knowledge, LSRC- lack of staff respect for culture, M - mean, Mdn - median, Mo - mode, MPS - manpower shortage, MSN - masters education in nursing, N - no, N - population size, n - sample size, NA- negative attitude, NC - # of pts in control group, NI - # of pts in intervention group, NPB - nurse patient barriers, NPC - negative personal characteristics, NPR - nurse patient relationship, NPR - nurse patient relationship, NRV - nurse related variables, OBC - organizational behavior change, OBP - organizational barriers to relationship between nurse and pts, ORV - organizational variables, P - psychopathological, PH - physical hold, PIU - psychiatric inpatient unit, PMT - parent management training, PPB - patient perspective barriers, PPE - patient perspective enablers, PR - physical restraint, PRB - patient related variables, PRNM - PRN medication, PRU - patterns of restraint use, Pts- patients, PV - physical violence, PW - psychiatric ward, R - restraint, Ra -Range, RP - restrictive practices, RRI - restraint reduction initiatives, RU - restraint utilization, S - seclusion, SD - standard deviation, SUR - service user researcher, TF - time frame, TR - therapeutic relationship, WE - work exhaustion, WO- work overload, Y - yes

Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
							-7.67, $p < 0.001$ (Cohen's d 2.46).	
Citation	Theoretical Framework	Design/ Purpose	Sample/Setting	Major Variables & Definitions	Measurements	Analysis	Findings	Decision for Use
Testad et al. (2015). Modeling and evaluating evidence-based continuing education program in nursing home dementia care (MEDCED)-training of care home staff to reduce use of restraint in care home residents with dementia. A cluster randomized	Person Centered Care Theory	Design: NRTC Purpose: To evaluate the effectiveness of a tailored 7-month training intervention "Trust Before Restraint," in reducing use of restraint.	N: 274 n: 118 IG n: 156 CG Inclusion: Inpatient Dementia Unit Exclusion: None Attrition: 72 Setting: Nursing home dementia unit	IV1: TFT Interventions DV1: Any restraint or coercive measure DV2: Agitation	TFT NPI CMAI Cohen-Mansfield Agitation Inventory: CMAI; NPI: Neuropsychiatric Inventory; Trust Before Restraint TFT	Independent T test Paired sample t test	DV1: 2.48 (0.051); 6.99; $p=0.051$; ($p<0.001$) DV2: 0.9 (0.228); 1.3 (0.388); p -value= 0.702	LOE: 2 Strengths: Large study, RTC Weaknesses: Large attrition rate Conclusions: Significant reduction in use of restraint in both intervention and control groups. Feasibility: This could be implemented in different settings with different patients such as psychiatric units.

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Citation	Theoretical Framework	Design/Purpose	Sample/Setting	Major Variables & Definitions	Measurement	Analysis	Findings/ Theme	Decision for Use
controlled trial. Country: Norway Funding: Norwegian Research Counsel Bias: None Declared								

Key: A - adolescents, AG - agitation, AGG - aggression, AP - Agreement to participate, B - bachelor, B - boys, BI - behavioral indicators, BSN- bachelor degree in nursing, CCD - comprehensive care delivery, CD - control and dominance, CE - coercive interventions, CD - communicative process, D- de-escalation, DI - duration of intervention, DQ- delinquent behavior, DT - de-escalation techniques, E - environmental EB - escalating behavior, EBT - evidence based treatments, EI - Environmental Influences EL - education level, EPB - escalating patient behavior, EPN - years in psychiatric nursing, ES - effect size, FAC - factors affecting connections, FCO - failure to communicate with others, FMHC - finnish mental health act, G - girl, SI - inpatient, ICS- insufficient communication skills, IL - interview length, IMM - intramuscular injectable medication, IO - increased observation, IP - interpersonal process, ITP - individual treatment plans, LNP- large number of pts, LOK - lack of knowledge, LSRC- lack of staff respect for culture, M - mean, Mdn - median, Mo - mode, MPS - manpower shortage, MSN - masters education in nursing, N - no, N - population size, n - sample size, NA- negative attitude, NC - # of pts in control group, NI - # of pts in intervention group, NPB - nurse patient barriers, NPC - negative personal characteristics, NPR - nurse patient relationship, NPR - nurse patient relationship, NRV - nurse related variables, OBC - organizational behavior change, OBP - organizational barriers to relationship between nurse and pts, ORV - organizational variables, P - psychopathological, PH - physical hold, PIU - psychiatric inpatient unit, PMT - parent management training, PPB - patient perspective barriers, PPE - patient perspective enablers, PR - physical restraint, PRB - patient related variables, PRNM - PRN medication, PRU - patterns of restraint use, Pts- patients, PV - physical violence, PW - psychiatric ward, R - restraint, Ra -Range, RP - restrictive practices, RRI - restraint reduction initiatives, RU - restraint utilization, S - seclusion, SD - standard deviation, SUR - service user researcher , TF - time frame, TR - therapeutic relationship, WE - work exhaustion, WO- work overload, Y - yes

Appendix B

Table 2

Synthesis Table

Author	Blair et al.	Bowers et al.	Ercole-Fricke et al.	Franco et al.	Makki et al.	Pazargadi et al.	Price et al.	Putkonen et al.	Singh et al.	Testad et al.
Year	2016	2015	2016	2016	2018	2015	2017	2013	2016	2015
Design/LOE	PS/3	RTC/2	QT/2	RTC/2	QI/3	DQ/4	DQ/4	RTC/2	RTC/2	RTC/2
Study Characteristics										
Demographics										
Number of Sites	1	15	1	1		1	7	13	1	24
N	3884	564		27	184	14	26	88	18	274
Time	3 years	24 weeks	5 years	10 weeks	9.2	1 year	6 months	6 months		7 months
Mean Age		33	14.5	15.85	15.47	38.5	NG	40.2	26	88.2
Female %	49.7%	59.4%	375	41%	29	50%	69%	n/a		72.9%
Male %	50.3%	NG	161	59%	29	50%	31%	88		
Setting	PIU	PIU	PIU	HS	PIU	PIU	PIU	PIU	CGH	NH
Measurement Tool Used	BVC	APDQ SHAS	CPS	BIS-11 AQ	AFQ-Y ACT	SSI	SSI	IRR	MBPBS TAU	TBR
Interventions										
ACT					X				X	
MBPBS				X					X	
AQ				X						
CPS			X							
6 Core Strategies								X		
SSI						X	X			
BIS				X						
BVC	X									
Structured Education/Training	X	X		X				X	X	X
SNPCC		X								
Findings/Outcome										
Agitation	↓									↓

Key: ACT - acceptance and commitment therapy; AFQ- Y - avoidance and fusion questionnaire for youth; AQ - aggression questionnaire; BIS - barratt impulsivity scale; BVC - broset violence checklist; CPS - collaborative problem solving; DQ - descriptive qualitative; GH - group home; HS - high school; IRR - inter rater reliability; MBPBS - mindfulness-based positive behavior support; NG - not given; NH - nursing home; PIU - psychiatric inpatient unit; PS - pilot study; QI - quality improvement ; QT - quantitative study; RTC - randomized control study; SMPCC - safewards model patient-staff conflict checklist; SSI - semi-structured interviews; TAU - treatment as usual; TBR - trust before restraint; ↓ decreased;↑ increased; ≠ not statistically significant

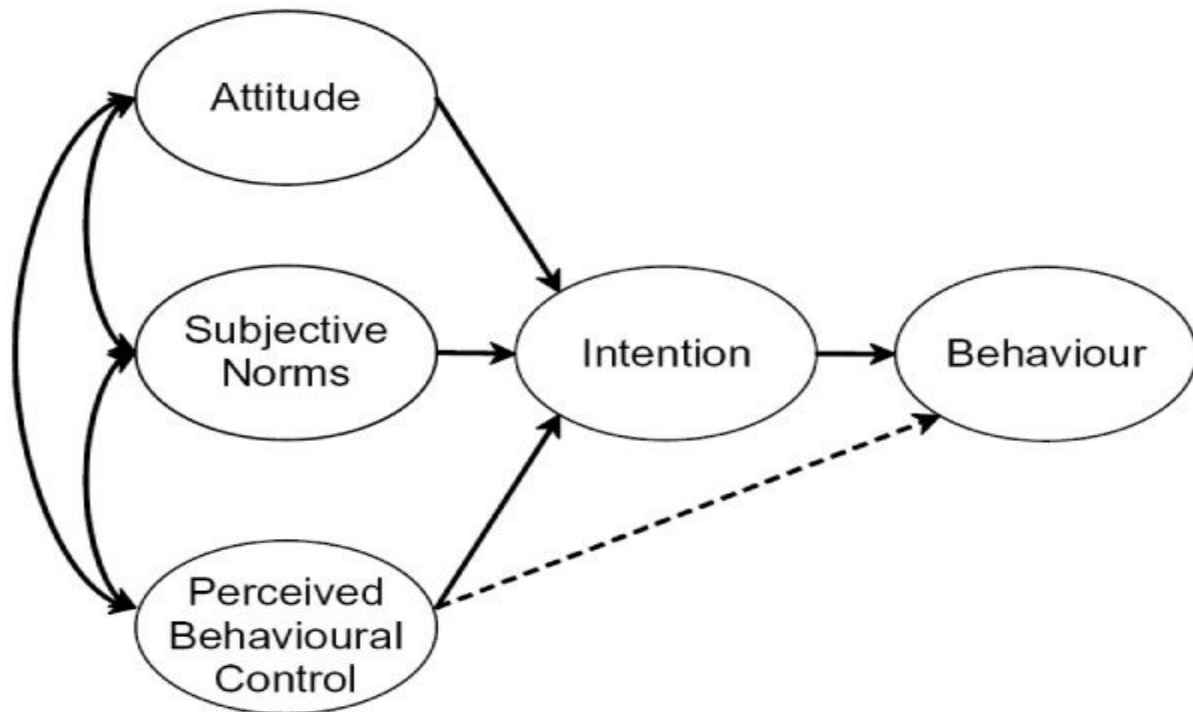
Impulsivity				↓						
Restraint	↓	↓	↓		↓	↓		↓	↓	↓
Seclusion								↓		↓
Adverse Event		↓	↓	↓						↓
Verbal Aggression				↓						
Physical Aggression				↓						
Staff Injuries								↓	↓	
Staff Turnover								↓	↓	
Staff Stress								↓	↓	

Key: ACT - acceptance and commitment therapy; AFQ- Y - avoidance and fusion questionnaire for youth; AQ - aggression questionnaire; BIS - barratt impulsivity scale; BVC - broset violence checklist; CPS - collaborative problem solving; DQ - descriptive qualitative; GH - group home; HS - high school; IRR - inter rater reliability; MBPBS - mindfulness-based positive behavior support; NG - not given; NH - nursing home; PIU - psychiatric inpatient unit; PS - pilot study; QI - quality improvement ; QT - quantitative study; RTC - randomized control study; SMPCC - safwards model patient-staff conflict checklist; SSI - semi-structured interviews; TAU - treatment as usual; TBR - trust before restraint; ↓ decreased;↑ increased; ≠ not statistically significant

Appendix C

Figure 1

Theory of Planned Behavior



Appendix D

Figure 2

The Precede-Proceed Model

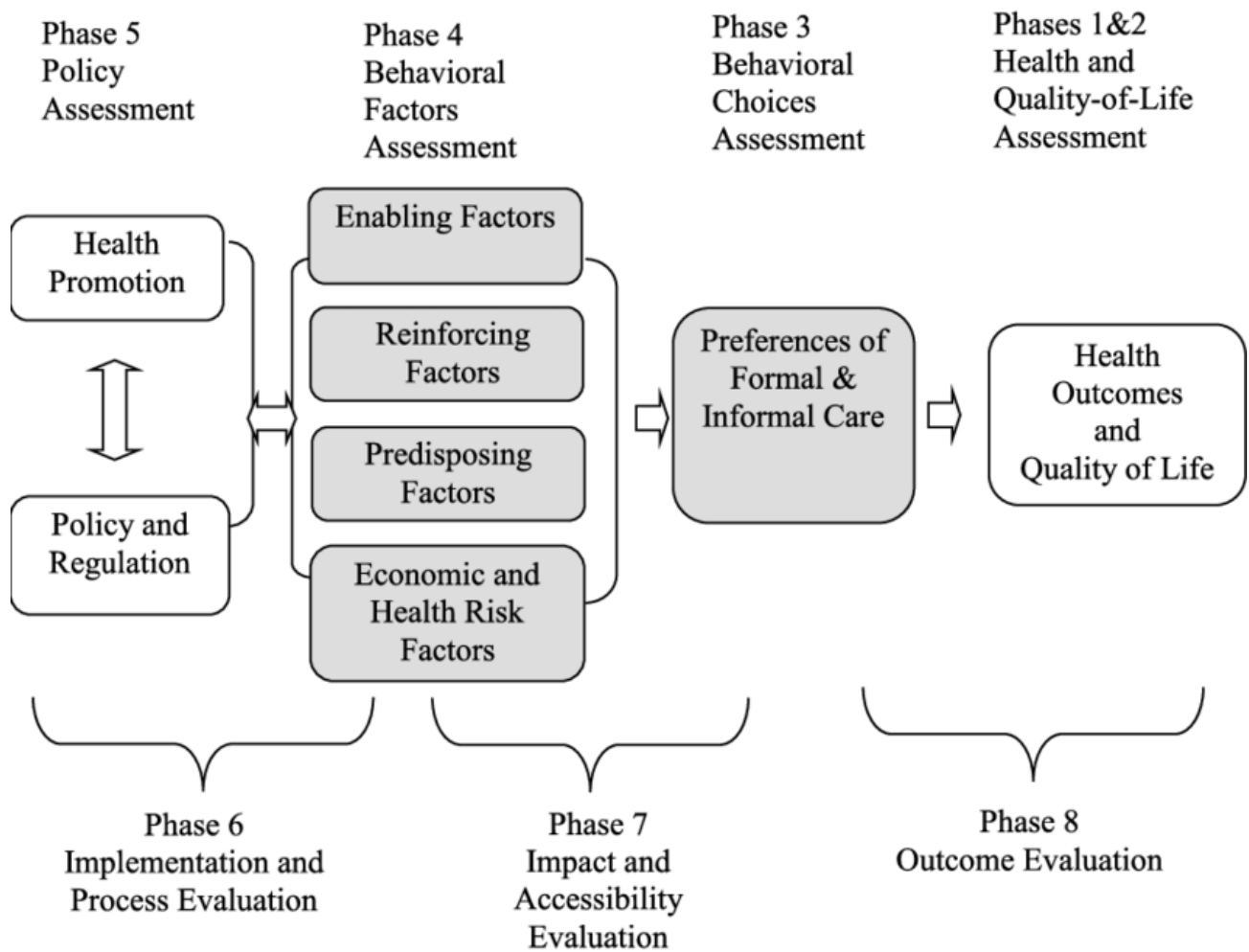


Figure 3

Budget

Project Phase	Activities	Direct Cost	Indirect Cost	Funding	Sub-total	Total Cost	Potential Revenue/Cost Savings
Preparation	Design and print pretest materials for participating staff (20 pretests printed)	\$50	\$0	None			
	Create educational intervention power point presentation (Print 20 handouts)	\$50	\$0	None			
	Design and print posttest evaluation materials (20 posttests printed)	\$50	\$0	None	\$150		
Delivery	1 Room for training presentation (hospital campus)	\$0	\$0	None			
	<u>Utilities:</u> Lighting, air, internet, computer use, storage. <u>Materials:</u> Pens, folders <u>Equipment:</u> Locked desk drawer for testing information storage for patient privacy. <u>Materials and Supplies:</u>	\$20	\$0	None			

Project Phase	Activities	Direct Cost	Indirect Cost	Funding	Sub-total	Total Cost	Potential Revenue/Cost Savings
	RN Time: 1 hour (\$35.00) p/hr. (35x10 RN)	\$0	\$350	None			
	BHT Time: 1 hour @ \$15 p/hr. (15x10 BHT)	\$0	\$150	None	\$500		
Evaluation	Review and analysis of results (SPSS)	\$0	\$0	None		Total: \$650	
Restraint Monthly Cost to facility (See details cost below)	Monthly restraint Average: 15 Average Length: 2 Hours	PRN Meds \$1455 Call to DR \$2475	RN Time \$1050 BHT Time: \$900	None	\$5880		Project Cost Savings: \$5230
Project Results & Benefit	Reduced seclusion/restraint use on the adolescent units, reduced staff and patient injuries	Reduce cost of staff time lost, PRN medication, and related supplies	Less staff and patient injuries, less sick calls, less turn over, more retention	Reduced Banner costs, gross profit increase as result.			Reduction in healthcare waste, better patient outcomes, quality health care, and cost reduction.

Budget Justification

**** Other Costs:** Travel (Clinical site is 80 miles distance from my home round trip), SPSS (Included in ASU tuition), cost of staff recruitment, laptop/power point software and training content for nurses and BHT’s in the hospital will be incurred by the student. Student is trained in house expert for restraint reduction re-education.

Seclusion and Restrain Episode Cost Breakdown:

Average Pay Per Hour:

- Banner RN \$35
- Banner Behavioral Health Tech \$15

Average Monthly Seclusion and Restraint Number: 15

Average Banner Adolescent Seclusion/ Restraint Time from Start to Finish:

- 2 hours

Average BHT Staff Present for 1 Restraint Episode:

- 4 BHT's

Average RN Staff Present for 1 Restraint Episode:

- 2 RN's

Includes:

- **Pre-Restraint:**

- Therapeutic communication and de-escalation attempt by staff
- Physical escort to seclusion room by staff
- RN to Call MD for Seclusion/Restraint/ PRN medication orders
- Obtain guardian consent for medication

- **Physical Hold/Restraint Application:**

- Apply 4-point restraint to each limb
- Administer PRN medication
- Continuously monitor patient until contract for safety
- Complete face to face assessment and restraint safety assessment

- **Post Restraint Activities:**

- Documentation
- Notify adolescent patient's legal guardian to inform of event
- RN complete incident report
- RN manager to notify insurance company if required.

- **PRN Medication Cost:** "B52" -Benadryl 50mg/ml, Haldol 5mg/ml and Ativan 2mg/ml combination injection.
 - The average cost for haloperidol injectable solution (5 mg/mL) is around **\$17** for a supply of 25 milliliters.
 - The cost for diphenhydramine injectable solution (50 mg/mL) is **AROUND \$22** for a supply of 10 milliliters.
 - The cost for Ativan injectable solution (2 mg/mL) is around \$58 for a supply of 25 milliliters.
- **Injection Supplies:** Injection supplies include gloves, needle, syringe, alcohol wipe, band aid (total cost unknown)
- **On Call Doctor:** \$165.00 per call after 5pm

Other Costs (Exact cost unknown):

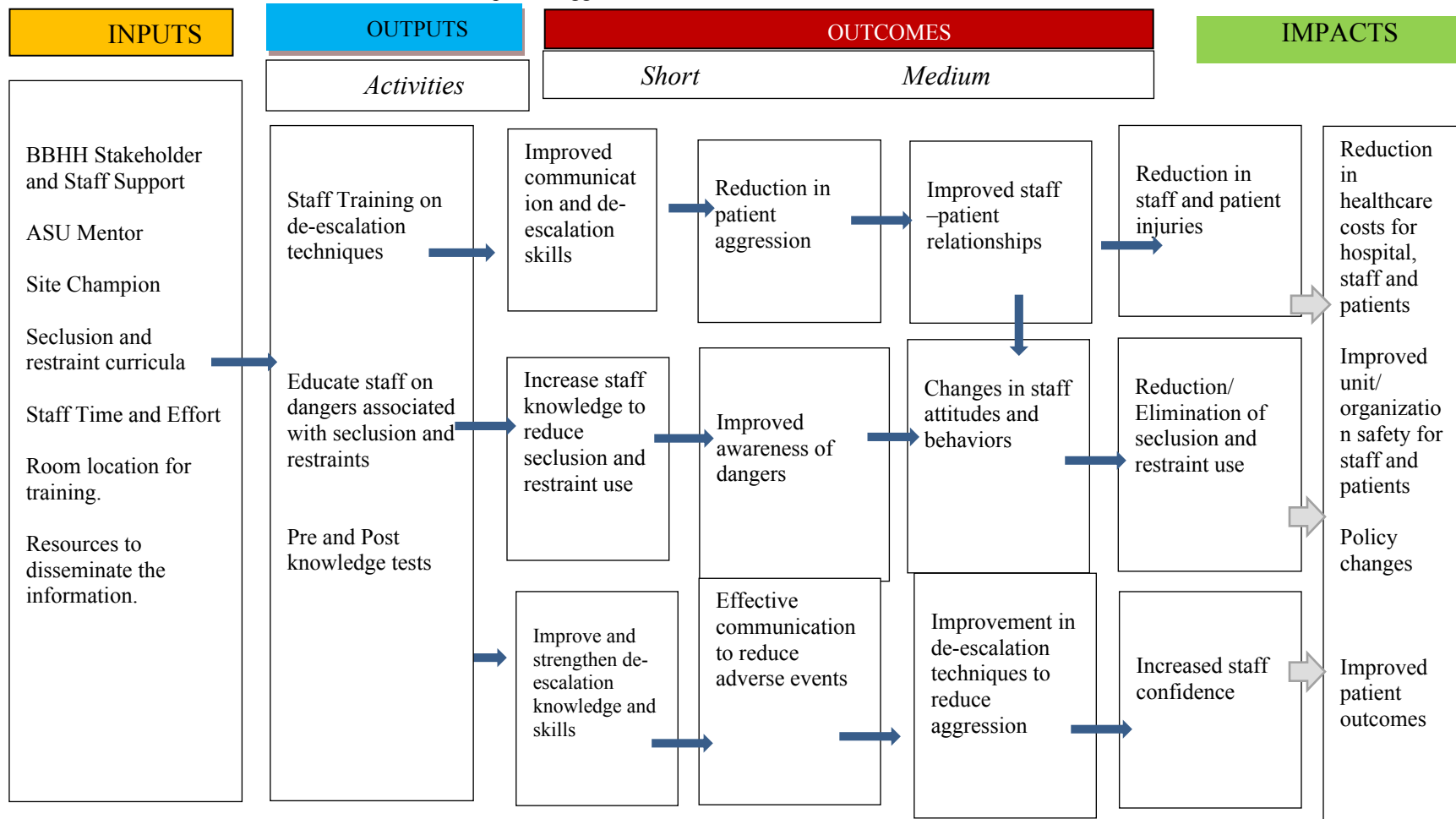
Cost of Patient Injuries and medical expenses

Cost of Staff Injuries:

- Results in Time off from work, medical expenses, disability claims, and staff turnover/replacement cost.

Figure 3. Logic Model for Seclusion and Restraint Reduction

Goals: To train and educate staff to reduce inpatient aggression and seclusion and restraint use.



Assumptions:

Staff de-escalation training will reduce the use of seclusion and restraints.

Staff education will reduce the use of seclusion and restraints.

Staff training and education will improve communication to reduce patient aggression that results in seclusion and restraint use.

