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An Evidence Based Evaluation of Patient Outcomes after the Implementation of a New Model of
Care for Adolescent Inpatient Psychiatry

Karen Dorr

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in

Partial Fulfillment of the Requirements

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FACULTY COMMITTEE:

Committee Chair: Dr. Jeannie Garber

Committee Member:

Dr. Maria DeValpine

Dedication:

This work is dedicated to the children who shared their personal experiences of traditional psychiatric care and its use of seclusion and restraint with me and the clinical educator and who inspired us to try to do better.

Acknowledgements:

Many people helped to see this project to fruition. Those needing special recognition here include Dr. Jeannie Garber, Dr. Maria DeValpine, Dr. Ellen Makar, and clinical educator, Jennifer Mace, whose dedication to clinical excellence greatly impacted the care given to the adolescents and helped to shape the scope of this project.

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Abstract:

The use of seclusion and restraint on psychiatric units can result in physical harm or even death to patients and may inflict further harm on those who have a history of abuse (Valenkamp, Delaney, & Verheij, 2014, p. 170) (Greene, Ablon, & Martin, 2006) (Martin, Krieg, Esposito, Stubbe, & Cardona, 2008). Reduction in seclusion and restraint is a basic tenant of trauma informed care. This retrospective review and program evaluation examines the implementation of a new care model on an adolescent psychiatry unit at a large suburban hospital. The new care model incorporated the use of collaborative problem solving, an intervention shown to reduce seclusion and restraint on adolescent psychiatry units (Bonnell et al., 2014) (Ercole-Fricke et al., 2016) (Greene et al., 2006) (Martin et al., 2008) (Pollastri et al., 2016) (Pollastri et al., 2013) (Regan et al., 2017) (Valenkamp et al., 2014) The theoretical framework used was Chen's theory driven framework for program evaluation (Chen, 2012). This model incorporates an action plan that examines the implementation and a change model that determines success using outcomes measures. The quantitative outcomes measure used to determine the successful implementation of the care model was the use of seclusion and restraint. Seclusion and restraint data was gathered for the new unit and for the years 2009-2011. The hospital did not provide adolescent care from 2012-2018. Quantitative data was analyzed comparing the rates of seclusion/restraint using the new care model compared to the rates using the former care model. Data showed a significant reduction in the use of seclusion using the new care model p -value<.00001, but failed to show any reduction in the use of restraint p -value=0.618414. Opportunities for improvement in the care model implementation included ongoing training and leadership support. Strengths

included the program implementors themselves, the environment for care model implementation, and the culture of professional development at the hospital. The most significant challenge of the implementation was the cultural mismatch between the care model that encouraged flexibility and collaboration and the hospital culture that required strict rule adherence and rigid thinking.

Key words: collaborative-problem-solving, Chen, seclusion, restraint, program evaluation, adolescent psychiatry

Introduction:

Historically, adolescent inpatient behavioral health units have used motivational programming to manage patients' behavior (Mohr, Olson, Martin, Pumariega, & Branca, 2009). Point and level systems have been the most common means to motivate children to adhere to prosocial behaviors and to maintain safety and order (Mohr et al., 2009). Point and level systems are founded on the understanding that motivation drives behavior. Units adopting this system rely on the fundamental belief that children behave well when they are motivated to behave well. However, structuring milieus based around the understanding that motivation drives behavior actually activates the child's stress response, increases the use of coercive measures and inhibits the therapeutic relationship (Mohr & Pumariega, 2004). Children with trauma are sensitive to power imbalances and judgement-- both of which occur in a milieu that is structured around motivational programming (Bryson et al., 2017). Collaborative problem solving, an intervention that is founded on the belief that children behave well when they have the skills to meet behavioral expectations, has been introduced on many adolescent psychiatry units (Greene, Ablon, & Martin, 2006). The belief underlying the use of collaborative problem solving is that children behave well when they can (Greene et al., 2006). This project evaluated how changing the care model and the way inpatient psychiatry units understand, treat, and think about children with mental illness from a motivational behavior management system to one that incorporates collaborative problem solving impacted the rates of seclusion/restraint.

Background:

A large suburban hospital in Virginia provided inpatient psychiatric care for adolescents as part of its adult psychiatric unit until 2012. The challenges of providing care to adolescents while maintaining separate programming and space from the adult population eventually led to the discontinuation of this care. The care model for this population had been a point and level system in which adolescents were rewarded for “good” behavior and punished for behavior that did not meet expectations. When the hospital decided to open a new adolescent psychiatric unit as part of its larger behavioral health expansion, this presented an opportunity to revisit the care model provided to adolescent patients. The psychiatry units at this hospital already had a high rate of seclusion and restraint for adults (69th highest restraint utilization facility in the US out of 1654 inpatient psychiatric facilities) (Data.medicare.gov website, 2017). This prompted the re-examination of the care to be provided on the new adolescent psychiatry unit. This was an opportunity not to revert to the old, but to research best practice and provide care that would improve outcomes for patients.

The new adolescent psychiatry unit opened in July 2018 with a scope of service of caring for children ages 14-17. This new unit is part of the larger behavioral health services and includes adult psychiatry (41 beds), detox (25 beds), and adolescent psychiatry (15 beds). In order to be accepted onto the unit, children must be a danger to themselves or others and must be able to benefit from the programming on the unit. Children who lacked the capacity to be able to benefit from the programming provided such as those who were significantly cognitively impaired due to autism or low IQ were not accepted. Children who were forensic patients in the juvenile justice system were not

accepted. While the adolescent care model previously provided in this hospital used a point and level system to manage the behavior of adolescents and had a high rate of seclusion and restraint in line with the high levels reported overall by this hospital, this new model of care on the new adolescent psychiatry unit combined patient family centered care, trauma informed care and collaborative problem solving – three pillars aimed at reducing episodes of seclusion and restraint and improving outcomes. Inpatient psychiatry units that have adopted collaborative problem solving as part of their care model have reduced or even eliminated episodes of seclusion and restraint on their units (Regan, Curtin, & Vorderer, 2017) (Greene, Ablon, & Martin, 2006) (Bonnell, Alatishe, & Hofner, 2014) (Ercole-Fricke, Fritz, Hill, & Snelders, 2016)(Pollastri et al., 2016) (Martin et al., 2008)(Valenkamp et al., 2014) (Pollastri, Epstein, Heath, & Ablon, 2013). A retrospective review of the implementation of this new model of care was undertaken to determine if this new model of care was implemented successfully as measured by reduced episodes of seclusion and restraint.

Literature review:

Prior to opening the new unit, literature was reviewed to determine the impact of seclusion and restraint and to determine the best care model to reduce the use of seclusion and restraint. Key words searched included “seclusion”, “restraint”, “adolescent psychiatry”, and “trauma informed care”. Databases included the Cochran Review, Cinahl, and PsychInfo. Subsequently, when collaborative problem solving was determined to be pivotal in reducing seclusion and restraint, the literature was reviewed using key word “collaborative problem solving”. The same databases were searched: Cochran Review, Cinahl and PsychInfo. These searches resulted in wealth of

information about the use of collaborative problem solving, its role in reducing seclusion and restraint, and the process of implementing a care model using collaborative problem solving including barriers to implementation and successes in reducing seclusion and restraint. Articles included in this review include those that demonstrate the impact of seclusion and restraint, those that demonstrate ways to reduce seclusion and restraint, the use of collaborative problem solving and its implementation, and trauma informed care.

Literature demonstrates the importance of limiting episodes of seclusion and restraint not only because it can result in physical harm or even death to patients (45 fatalities between 1993-2003 in child and adolescent psychiatry units), but because it inflicts further harm on patients who have an abuse history, may cause staff injury and contribute to staff turnover, and may actually increase aggressive behavior (Valenkamp, Delaney, & Verheij, 2014, p. 170) (Greene, Ablon, & Martin, 2006) (Martin, Krieg, Esposito, Stubbe, & Cardona, 2008). According to Cochrane review, “no controlled studies to support the continued use of seclusion or restraint in clinical practice were found” (Sailas & Fenton, 2012, p. 8). However, more than 25% of child or adolescent patients experience seclusion and 29% experience restraint (Valenkamp, Delaney, & Verheij, 2014, p. 169). Literature shows that the most frequent reason for the use of restraint in adolescent patients is harming others (53%), followed by self-harm (22%) and damaging property (17%) (Furre, Sandvik, Friis, Knutzen, & Hanssen-Bauer, 2016, p. 65).

A number of studies have examined ways to reduce seclusion and restraint on psychiatric units and specifically on adolescent units (Caldwell et al., 2014) (Valenkamp et al., 2014)(Reynolds et al., 2016)(Greene et al., 2006)(Martin et al., 2008)(Bonnell,

Alatishe, & Hofner, 2014)(Pollastri, Leiberman, Boldt, & Ablon, 2016). One article suggests that the use of Positive Behavioral Interventions and Supports (PBIS) is effective in reducing seclusion and restraint (Reynolds et al., 2016). Unlike the point and level systems addressed above, PBIS sets expectations and only uses a positive reward system (Reynolds et al., 2016). With the implementation of this system, seclusion and restraint episodes decreased from 543 to 253 during the study period (Reynolds et al., 2016).

A number of studies point to the use of collaborative problem solving in the care model to address all three elements of seclusion/restraint, aggressive events, and patient satisfaction. (Regan, Curtin, & Vorderer, 2017) (Greene, Ablon, & Martin, 2006) (Bonnell, Alatishe, & Hofner, 2014) (Ercole-Fricke, Fritz, Hill, & Snelders, 2016)(Pollastri et al., 2016) (Martin et al., 2008)(Valenkamp et al., 2014) (Pollastri, Epstein, Heath, & Ablon, 2013). According to Bonnell et al. after staff incorporated collaborative problem solving on a seven bed child/adolescent inpatient psychiatry unit, the unit experienced reduced reportable events (including verbal and physical aggression) and reduced security and seclusion (Bonnell et al., 2014). Greene et al. completed a landmark study in 2006 that demonstrated a dramatic reduction in seclusion and restraint after adopting collaborative problem solving (Greene et al., 2006). In the 9 months prior to staff training in collaborative problem solving, there were 281 episodes of restraint, but only one episode of restraint in the 15 months after the training (Greene et al., 2006, p. 612). Another study examined the effects on an adolescent unit after the introduction of collaborative problem solving finding that there was a decrease in behaviors leading to seclusion and restraint, a decrease in self-injurious behavior, a reduction in the need for

security and a decrease in punitive strategies (taking away points, room restriction) (Ercole-Fricke et al., 2016). A quantitative study by Martin et al revealed a significant reduction in restraint and seclusion after introducing collaborative problem solving on a 15 bed adolescent psychiatry unit (Martin et al., 2008). Pollastri et al completed a study in 2016 that examined an organization wide implementation of collaborative problem solving and found that there was a reduction in restrictive practices and the financial costs associated with them (Pollastri et al., 2016). A review of collaborative problem solving across treatment settings (inpatient, school, outpatient) found that there was a decrease in oppositional behavior, use of restraints, seclusions, school suspensions and an increase in social and executive functioning skills for patients/students (Pollastri et al., 2013). A literature review by Regan, Curtin, and Vorderer describes collaborative problem solving as an integrative part of family centered care that reduced seclusion and restraint, decreased staff injuries, and reduced staff turnover (Regan et al., 2017). The incorporation of collaborative problem solving on a 24 bed adolescent unit in New York resulted in a 75% reduction in seclusion and restraint in the first year (Sams, Garrison, & Bartlett, 2016). Finally a review by Valenkamp et al. determined that collaborative problem solving reduced seclusion and restraints for children and adolescents (Valenkamp et al., 2014).

In addition to models specifically geared to reduce seclusion and restraint, the literature search also examined general models of care for adolescent psychiatry. One of the most important elements of an adolescent care model was found to be trauma-informed care (Regan et al., 2017) (Goulet, Larue, & Dumais, 2017) (Bryson et al., 2017). Regan et al.'s study of a child and family centered care model examines the role

of trauma and the brain and how it affects a child's ability to develop the trusting relationships needed to benefit from inpatient care (Regan et al., 2017). A systematic review by Goulet et al. examines seclusion and restraint and finds trauma informed care to be instrumental in reducing seclusion and restraint (Goulet et al., 2017). Finally a systematic review specifically examining the impact of trauma-informed care in adolescent inpatient settings finds that trauma informed care reduces coercive measures as well as seclusion and restraint, staff and patient injuries, and may also improve clinical outcomes (Bryson et al., 2017).

While the evidence for using collaborative problem solving and trauma informed care instead of coercive measures on an adolescent psychiatry unit is strong, implementing a care model that incorporates these elements and creating a therapeutic environment that effectively uses them is difficult. The significant body of literature devoted to the successful implementation of collaborative problem solving and trauma informed care also highlights the challenges incorporating these models into care. The article by Caldwell et al. points out that two barriers to successful implementation were rigid thinking, education, and staff comfort (Caldwell et al., 2014). Leadership and continuing workforce development and education were important in overcoming these barriers (Caldwell et al., 2014). Bryson's systematic review determined that leader support, advanced training for staff, listening to patients and families, continually reviewing data, and working to change the culture all were critical to implementing a successful program (Bryson et al., 2017). Goulet's systematic review has similar findings in reducing seclusion and restraint through leadership, training, post-seclusion and restraint review, patient involvement, prevention tools and the therapeutic milieu

(Goulet et al., 2017). Regan's article describes the culture change needed for a new approach to care and how it was facilitated by an initial seminar followed by twice weekly group supervision meetings during a 7 month period (Regan et al., 2017). The adoption of collaborative problem solving was challenged on an inpatient adolescent unit by staff anxiety and concern that they would lose their current strategies to "control" patients (Ercole-Fricke et al., 2016). A training program followed by a focus groups and role playing helped to implement the new model (Ercole-Fricke et al., 2016). In instituting a trauma informed care model on an inpatient unit, an acute unit in Australia established a work group to guide the development and implementation of the new model (Isobel & Edwards, 2017). This group met monthly but still experienced significant difficulties in communication and sharing information (Isobel & Edwards, 2017). To incorporate collaborative problem solving on a 24 bed adolescent inpatient unit, the unit initiated formal training and then weekly team meetings along with real time coaching and mentoring by clinical leadership (Sams et al., 2016).

Methodology:

Given the importance of limiting seclusion and restraint on the new unit and the difficulties in implementing a care model designed to reduce or eliminate seclusion and restraint, a careful examination of the implementation and its outcome was undertaken. This care model implementation was examined using Chen's theoretical framework for program evaluation to determine if the model of care was successfully implemented by reducing seclusion and restraint and thus improving outcomes. Chen's conceptual framework encompasses both action and change models and examines the program from resources allocated to program implementation and finally to outcomes (Chen, 2012).

Using this conceptual framework allowed a full analysis of the implementation of this care model from planning to outcome. This framework examined the resources applied, the stakeholders, implementors, ecological context, and outcome (Chen, 2012). This theoretical framework guided the evaluation process to determine if the implementation was successful and in relationship to the contextual factors important in the implementation. The quantitative outcomes measure used to determine the successful implementation of the care model was the use of seclusion and restraint. The rates of seclusion and restraint were compared for years 2009-2011 to the rates of seclusion and restraint during the first 6 months after opening the new unit. The standard rate calculation for seclusion and restraint is hours of restraint or seclusion per 1000 hours of patient care provided. P-values were calculated to determine significance of results.

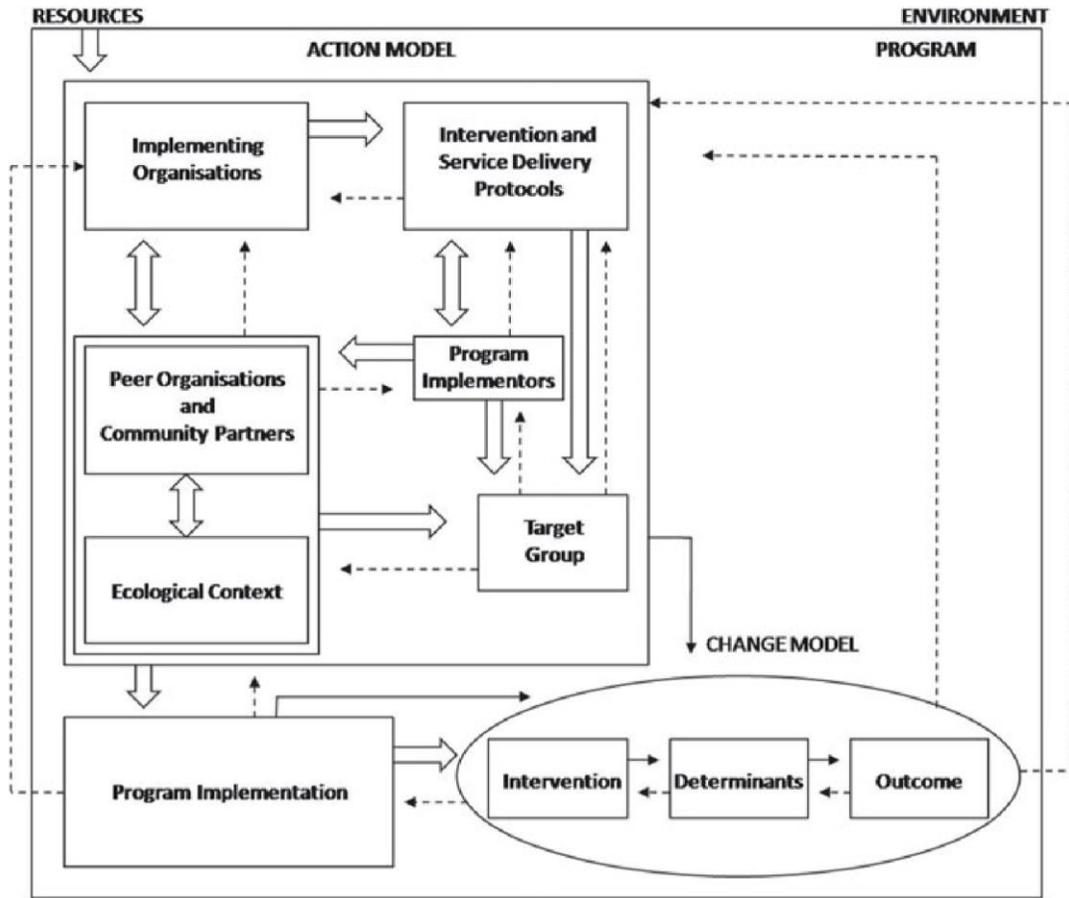
Chen's Theory Based Model for Program Evaluation

Chen's model requires the analysis of what he refers to as the action model (Chen, 2012). The action model consists of the "systematic plan for arranging staff, resources, settings and support organizations to reach a target group and deliver the intervention services" (Chen, 2012, p. 18). In other words, how has the organization assembled all the resources necessary to successfully implement a new care model on the adolescent unit. The analysis of the action model begins with an overview of the implementing organization and its ability to allocate resources including its ability to hire and train staff, provide an environment conducive to the success of the model, and support the new model on an ongoing basis to allow for continued success (Chen, 2012). Chen also refers to the intervention itself and the service delivery protocols (Chen, 2012). This would include all the ways the new care model was implemented on the new unit including

assessments, treatment plan inclusion, documentation, and unit rules/expectations. The program implementors represent another part of the Chen's action model (Chen, 2012). In order to successfully implement a care model throughout an entire unit, all staff were considered implementors of this care model. Staff included nurses, mental health technicians, counselors, social workers, physicians, and the unit director. According to Chen, peer organizations play an important role in the success of any program implementation by benefitting, cooperating, or collaborating with the implementing organization (Chen, 2012). He contends that if a link or partnership is not established, the program (or in this case, care model) may face challenges in implementation (Chen, 2012). The target population for this care model was the adolescent inpatient population. According to Chen, the successful implementation of a program (or care model) also depends largely on the ecological context in which the program is being implemented (Chen, 2012). The involvement of a supportive environment, both at a macrolevel and a microlevel are critical to success (Chen, 2012). The microlevel ecological context includes the social, material, and psychological supports patients need to participate in the care model (Chen, 2012). The macrolevel context includes community norms, cultures, as well as political and economic processes (Chen, 2012). The macrolevel context for the purpose of this study focuses on the norms, culture, politics, and economic processes within the hospital organization itself. This assessment uses a linear model with a single determinant for outcome evaluation (Chen, 2012). Literature shows that when this care model incorporating collaborative problem solving is successfully implemented, the use of seclusion and restraint on adolescent psychiatry units is decreased (Bonnell et al., 2014) (Ercole-Fricke et al., 2016) (Greene et al., 2006) (Martin

et al., 2008) (Pollastri et al., 2016) (Pollastri et al., 2013) (Regan et al., 2017) (Valenkamp et al., 2014). The single determinant for successful implementation in terms of outcomes is the use of seclusion and restraint.

Figure: 1 Chen’s Model for Program Evaluation

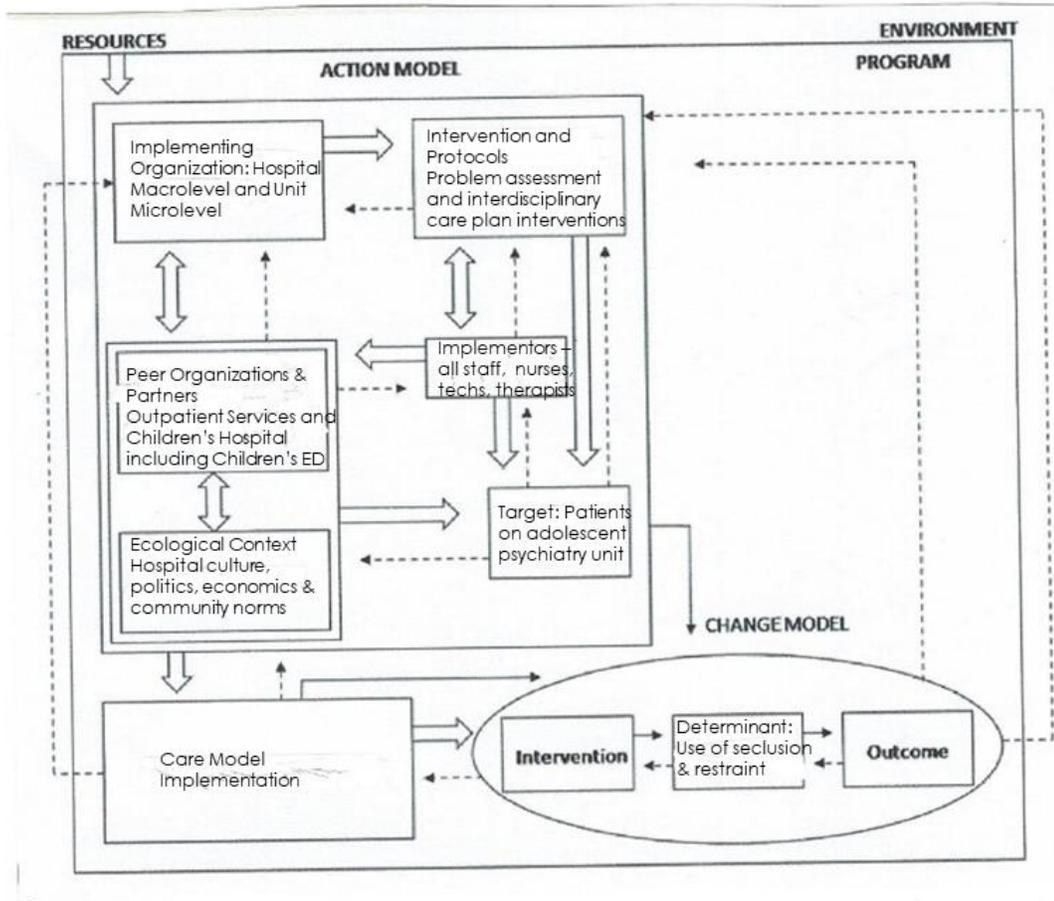


(Chen, 2012, p. 20)

Statistical methodology included a comparison between hours of seclusion and restraint on the new adolescent unit compared to hours of seclusion and restraint used when caring for adolescents using the former care model from 2009- 2011. Hours/rates of seclusion and restraint and episodes of seclusion and restraint on the new unit were compared to hours/rates and episodes of seclusion and restraint when the hospital

provided adolescent care from 2009-2011 to determine if there was a decrease in seclusion and restraint using the new care model. The P-value was calculated to determine statistical significance of the finding.

Figure 2: Chen’s theoretical model customized for the implementation of the care model on the adolescent psychiatry unit



(Chen, 2012)

Results:

Action Model: Implementing Organization

The Environment

The organization allocated significant space to implement the new care model.

The organization provided a new adolescent psychiatry unit that included 13 patient

rooms including 11 private rooms and 2 semi-private rooms. The new unit also included a recreation room, art studio, group room, patient dining area, patient multipurpose room, several consult rooms to meet individually with patients, and the ability to divide the entire unit in half to segregate different populations or patients as needed. The space itself allowed an optimal balance of group and private spaces to allow staff to interact easily with patients in both group collaborative problem solving or individual collaborative problem solving. The space allowed for freedom for patients to move easily among different spaces while restricting access for safety if needed. The new unit represented a significant financial investment in targeting and caring for the adolescent population in behavioral health.

Hiring staff

The organization provided an adequate budget to hire new frontline staff to implement the new care model. The staffing provided included nurses, mental health technicians, social workers, and therapists. The organization did not allocate any financial resources to hire additional leadership for the new unit. The leader of the detoxification unit was designated to be the leader of this new unit as an additional responsibility. This designation was made a few months prior to the opening of the new adolescent unit, providing the leader with little time to ensure that effective resources were in place to successfully open the new unit with a new care model.

In addition to the financial resources to hire sufficient direct care staff, the organization provided the resources to recruit new staff members to implement this new care model. The unit benefitted from a designated recruiter for behavioral health services. The structure in place to advertise, market, maintain a jobs website, prescreen,

and schedule interviews facilitated the successful hiring of staff to implement the care model. Despite this organizational support, no additional staff was hired or designated to interview or hire staff to implement this care model. The leader of the adolescent unit interviewed and hired all staff for the adolescent unit. This leader screened all staff to ensure that those hired were receptive to the new care model and possessed the critical thinking skills needed to implement the new care model.

Training

In addition to the hiring of all new staff to implement the new care model, the training of all staff in the implementation of the new care model and the supervision of the implementation and care had to be provided. The organization hired a clinical educator specializing in behavioral health to research, develop, and train all staff in the new care model. This clinical educator not only completed the research required to develop the new care model, but also developed the complete education program for all staff including developing all the training materials. The clinical educator had a limited amount of time to complete the research and the development of all the educational materials and training. This educator was hired 6 months prior to the opening of the unit. Her research was completed two months prior to the unit opening and the training materials developed and presented in the two weeks prior to the opening of the unit. This compressed timeline did not allow for others to review the training materials or the education program overall. This potentially weakened the material presented and also contributed to lack of organizational acceptance and support.

The clinical educator trained all the staff. Dedicating a staff member specifically to train all the staff on the adolescent unit represented a significant investment and

commitment of the organization. However, this training represented a monumental task to delegate to a single person. All staff hired initially to provide care on the adolescent unit received training in trauma informed care, collaborative problem solving, and patient centered care. This training was completed in a classroom using PowerPoint slides, web-based education, discussion, and role play. Providing a full week of educational training in the new care model demonstrated a commitment by the organization to train all staff in the new model. No ongoing training was developed or implemented for the staff. This was a one-time training opportunity with no continued education, mentoring support, or training built into the implementation of the care model on the unit.

Prior to opening the new unit, staff did not orient or train with the target population. While some effort was made to orient staff with the target population in the outpatient setting, that effort was poorly received and discouraged by the outpatient program. The outpatient program limited the staff who could shadow at their program and limited the times when staff could visit. This resulted in most staff observing and orienting with the target population for less than 4 hours total if any hours at all. The organizational expectation was that the unit be opened with the new model of care in place with staff having limited to no prior experience with the target population and no ongoing training and support in the new care model.

Action Model: Program Implementors

All clinical staff on the unit were considered implementors of the care model. Clinical staff were hired specifically for their receptivity to the new care model and their critical thinking skills and dedication to a care model that limited the use of seclusion/restraint. Initially only the nurses and mental health technicians who were

hired attended the full training in the new care model. Counselors attended an abbreviated educational session, but not the full training. The social workers did not attend the training on the new care model. There was no medical director designated for the new unit, and no physicians were trained in the new care model. In addition, no new staff were trained after the third month of opening the new unit. The first group of staff hired were trained in the new care model during a one-week classroom orientation period. A second cohort of nurses and techs were also trained during an abbreviated 3-day training. Subsequent staff were not trained at all in the new care model as no resources were dedicated to the training of new staff. These staff relied on their orientation with current staff to learn the care model. After the new unit opened, the clinical educator assumed responsibility for training all staff on all the psychiatric units in the hospital including the adult mood unit, adult acute unit, adult medical psych unit and the detoxification unit. None of the educator's time was time was allocated for ongoing support and training of the new staff on the adolescent unit.

Action Model: Peer Organizations and Community Partners

The most important collaboration was with the outpatient service organization serving adolescents as part of the same behavioral health service line. An effort was made to orient staff on the outpatient unit, but little cooperation was established between inpatient and outpatient. The new care model on the inpatient unit was complementary to the outpatient unit, but not identical. The new model was presented to the outpatient unit very late in the implementation process allowing for little discussion and collaboration. Both models of care used trauma informed care and patient centered care. However, the outpatient staff used a positive behavioral intervention system in their care model

requiring rewards and points. The outpatient facility did not use an established collaborative problem solving model. The outpatient staff did not collaborate in establishing the new care model on the inpatient unit and the inpatient unit failed to effectively engage outpatient staff in the new inpatient care model. This created friction between the inpatient and outpatient units.

Action Model: Intervention and Service Delivery Protocols

In addition to training staff in the implementation of collaborative problem solving by training staff to engage in the process real time with patients, the collaborative problem-solving process was incorporated into the assessment process, the interdisciplinary care plans for each patient and the individual interventions for each patient. While the intervention included the complete aspect of training and implementation, the service delivery protocols included an assessment of each child that identified problematic behaviors and problems to be solved. This assessment and the identified problems triggered a specific treatment plan to address those problems to be solved. The service delivery protocols included the use of the problem identification assessment form and the addition of the identified problems and their associated interventions into the interdisciplinary treatment plan. This process of assessment for problems to be solved (including the completion of the form) and the identification of interventions in the interdisciplinary care plan represented the implementation of the collaborative problem-solving model. While the staff were comfortable and effective in completing the assessment forms to identify problems and adding those problems and interventions into the care plans, it was unclear if staff's comfort extended to implementing collaborative problem solving with each patient or group of patients when

a new problem would arise on the unit. Staff expressed a lack of confidence in implementing the model in real time with patients in the target population. While staff demonstrated laudable reticence to employ coercive measures with patients, including the use of seclusion/restraint, they lacked confidence in executing the collaborative problem-solving process. No resources were identified during the ongoing implementation of the care model to assist with ongoing training or support.

Action Model: Ecological Context

The microlevel contextual support includes the physical environment itself that fosters participation in the care model. A balanced mixture of private and group spaces, the ability to flex spaces from group to private, and the visibly open nursing station provided a physical space optimally suited to facilitate participation in the care plan. Other microlevel contextual supports included a daily programming schedule that encouraged group participation while allowing patients to interact one on one with staff as needed. The schedule itself supported implementation of the care model through both its structure and flexibility. The implementation of the care model did not include a parental education program that could have increased microlevel contextual support. The program lacked a robust education program about the care model for both parents and patients as part of the admissions process to the new unit.

The macrolevel contextual support for the care model presented a larger challenge to the implementation of the care model. Macrolevel supports included strong organizational support for the success of the new unit overall as well as strong organizational financial support as demonstrated through the significant financial investment in a newly designed and expanded space. The organization itself supported a

culture that valued the implementation of evidence-based practice and high-quality care as demonstrated through its robust research program and professional practice program. Strong leadership support of the physical environment and the new technology introduced to support the care model also was a macrolevel contextual support of the care model. Hospital leaders frequently visited the new space and confirmed with staff their competence and their appreciation of the new technology introduced, such as the new nurse call system, pivot phones, alarm system etc. The organizational culture that valued strong regulatory compliance and The Joint Commission recognition also supported this care model as the care model exceeded regulatory requirements and presented an advancement in individualization of care plans. Leadership's support of frontline staff and bedside nurses and their success and satisfaction working on the new unit also provided macrolevel contextual support. Hospital leaders rounded on the new unit and met with staff to gather feedback both during day shifts and night shifts. Internal and external collaborators' desire to see the new unit succeed also presented a macrolevel contextual support. Both the children's hospital and its' associated pediatric emergency department and the outpatient program for adolescents expressed strong support for the new unit and its success. Prior to the unit opening, the children's hospital's emergency department frequently boarded patients waiting for placement at other facilities. The outpatient unit also expressed the frustration of sending their patients to a higher level of care and having difficulty finding placement. Both were strongly vested in the new unit if only because they both were frustrated with placement of adolescent psychiatric patients and appreciated the resource available with the unit's opening to meet the needs of their patients.

These strong macrolevel contextual supports were eclipsed by the strong contextual macrolevel challenges for the implementation of the care model. There was a lack of organizational leadership trust in the competence of the leadership of the behavioral health service line. This lack of confidence was expressed through numerous meetings requesting updates on capacity and practice issues. While numerous meetings could be viewed as supportive, behavioral health leaders did not perceive these as positive interactions as each behavioral health leader packed a “to go” bag kept in her office in case of imminent dismissal. Hospital leadership also had limited understanding of behavioral health practice, the target population, and best practice guidelines for inpatient behavioral health programs and care models. One example of this lack of understanding was the dismay expressed by a senior nursing leader when she came to the unit to find several patients sitting on the floor in the corridor with a staff member (the patients had sat down in the corridor and a staff member had joined them to engage in education and therapeutic communication). The unit opened without having a dedicated medical director in place to provide support, guidance, and leadership in patient care on the unit. The organization fostered a rigid culture that emphasized strict compliance to rules and inflexibility. Emphasis on rules and compliance runs directly counter to the collaborative problem-solving approach introduced with the new care model. This discord created friction between the hospital and the new care model on the unit. This discord was frequently expressed through the hospital leadership’s request for security presence on the unit with the goal of enforcement and behavior management. The unit staff had a high tolerance for annoying or disruptive behavior that was not unsafe, while the organization had a low tolerance for lack of adherence to the “rules”. The

organizational leadership outside of behavioral health had little understanding of the new care model, its emphasis on expectations not “rules”, its’ collaborative approach, and its’ lack of coercive measures.

Action model: Target Population

The target population for this care model was the adolescent inpatient population. Due to the fact that this was an inpatient population, these patients were physically available for staff to apply the intervention and the service delivery protocols needed to implement the care model. This target population included some patients who were not mentally healthy enough to be able to participate in this care model fully. Patients who were actively psychotic or catatonic had limited participation in collaborative problem-solving, but benefitted from a therapeutic milieu that incorporated family centered and trauma informed care.

Strengths and Weakness of the implementation as viewed through the Action Model:

In examination of the action model identified by Chen as important in program success, it appears that the resources allocated to ensure the success of the new care model were uneven with considerable resources allocated to the physical space and fewer resources allocated to support, training, and leadership. There was a significant investment in the design and physical space required to implement the new care model. The physical environment in which to implement the new care model represented a strength of the implementing organization. The dedicated staff to recruit new staff for the new unit along with the resources to provide sufficient direct patient care staff also was strength of the implementing organization. The ability of a leader strongly committed to the new care model to interview and hire all staff who were receptive and committed to

the new care model was a strength in the process. The hiring and onboarding of the clinical educator dedicated to the development and implementation of the new care model was a strength of the implementing organization. The program implementors themselves represented a strength in the action model as they each demonstrated a strong commitment to the new care model and to the lack of use of coercive measures in providing care and managing behavior. The enthusiasm and dedication of those trained remained a strength of the implementation. Peer organizations and community partners vested interest in the success of the new unit represented a strength, but their lack of education and support of the new care model presented a weakness. The organizational commitment to implementing a strong evidenced based practice care model presents a cultural strength of the organization.

Significant weaknesses also existed in the action plan. There was an investment initially in the recruiting and training of staff, but that training did not extend beyond the initial orientation period. This resulted in a lack of staff confidence and a lack of developing further skills in the implementation. Lack of staff comfort has been identified as a significant barrier to success of implementing the model (Caldwell et al., 2014). Ongoing support and training has been identified as a critical element in the successful implementation of a care model incorporating collaborative problem solving (Caldwell et al., 2014)(Bryson et al., 2017)(Regan et al., 2017)(Ercole-Fricke et al., 2016). In addition to ongoing training and support, leader support has also been identified as critical in implementing this model of care (Caldwell et al., 2014) (Bryson et al., 2017)(Goulet et al., 2017) (Sams et al., 2016). The program implementors were a strength of the implementation process, but again this resource provided by the organization was uneven

as not all staff were trained in the new care model, yet all staff were essentially implementors. While the intervention and service protocols were again strong, the lack of ongoing training, outcomes assessments, and audits presented a weakness to the process.

Finally, the ecological context was again mixed with strengths being organizational and leadership support for the unit itself and the frontline staff, but lack of organizational and leadership support of the new care model and of the behavioral health and unit leadership. Lack of organizational leadership understanding of behavioral health care standards and best practices also weakened the ability for the care model to be successfully implemented. The lack of leadership support represented a significant organizational weakness in the implementation plan. Failing to allocate greater leadership support represented an organizational weakness in the hiring and onboarding process. This presented a significant challenge in ensuring that all implementors of the new care model were hired in an effective and timely manner. The lack of leadership support beyond a single leader was a weakness in the implementing organization. Leadership support has been identified throughout the literature as an important element in ensuring success in implementing the new care model (Bryson et al., 2017) (Goulet et al., 2017). Lack of leadership or collaborators to review the educational material or training about the new care model due to the compressed timeline represented a weakness of the implementing organization. The organizationally imposed compressed timeline (clinical educator hired 6 months prior to opening and unit leader notified of new role as leader of the unit 4 months prior to opening) along with limited resources (only one clinical educator) to develop all educational materials and training represented a

weakness of the implementing organization. While the staff received classroom training in the new care model, there was a lack of resources dedicated to the training and orientation of the staff with the target population itself. Ongoing training and support along with continuing staff development, leader support, and clinical and leadership mentoring of staff has been identified as important in implementing this care model (Bryson et al., 2017) (Goulet et al., 2017) (Sams et al., 2016). This lack of ongoing training for staff continues to be identified as a weakness in the care model implementation. Parental support of the care model and their encouragement of their children's participation in the treatment plan both represented a potential strength or a potential weakness of the microlevel contextual support. A potential lack of both patient and parental trust in the program represented weaknesses in the care model implementation. While there were significant strengths in the macrolevel context, weaknesses significantly undermined the successful implementation of the care model. This lack of understanding was not addressed by the behavioral health leadership team thus contributing to this significant contextual weakness to the implementation of the care model. Another weakness in the contextual support was the lack of understanding by leadership that physician involvement and support was important in opening a new unit. The inflexible culture of the organization overall presented a weakness in the implementation of a care model built on flexibility and collaboration. Rigid thinking has been identified as a barrier to successful implementation of the care model (Caldwell et al., 2014). This lack of understanding presented a significant weakness of the macrolevel contextual support.

Table 1: Summary of Strengths and Weaknesses using Chen's Action Model

Element of Chen's Model	Strengths	Opportunities
Implementing organization	<ul style="list-style-type: none"> • Investment in new unit, beautiful new design, excellent layout to promote care model. • Dedicated recruiter to assist in attracting and hiring new staff. • Dedicated clinical educator to research, design new care model, develop educational models, provide all training of new staff. • Outside vendors dedicated to training all new staff on all units on new technology and equipment on the new units. 	<ul style="list-style-type: none"> • No additional resources allocated to assist in hiring new staff (besides dedicated recruiter). • No ongoing training of staff beyond the initial training provided during the classroom orientation. • Little to no orientation provided for staff with the target population. • Limited training for staff other than nursing and mental health technicians. • No dedicated medical director for the new unit to support the care model. • No additional leadership support for the new unit and the new care model • Compressed timeline of 6 months or less for unit leader involvement and clinical educator involvement in new unit and new care model.

<p>Program Implementors</p>	<ul style="list-style-type: none"> • All nurses and techs hired to implement the program hired for critical thinking skills and receptivity to the new care model. • All nurses and techs hired initially completed training in the new care model. 	<ul style="list-style-type: none"> • Physicians not involved in new care model and not trained in the new care model. • Social workers not involved in the new care model and not trained in the new care model. • No ongoing training or support offered to staff trained in the new care model.
<p>Peer organizations/community partners</p>	<ul style="list-style-type: none"> • Strong outpatient program that provides patient centered, trauma informed care. • Commitment of outpatient program to collaborate and coordinate care with new inpatient unit. • Commitment of inpatient pediatric unit to collaborate and coordinate care. 	<ul style="list-style-type: none"> • Strong outpatient program uses PBIS model (motivational system) not a collaborative problem solving model. • Inpatient behavioral health leaders' failure to present new care model to outpatient collaborative organization prior to implementation
<p>Intervention and service delivery protocols</p>	<ul style="list-style-type: none"> • Clearly defined assessment form provided and assessment training provided to identify problems to complete form. • Clearly identified interventions provided linked to identified problems in the problem assessment form. 	<ul style="list-style-type: none"> • Lack of real-time training/practice provided with target population. • Limited ongoing feedback for implementation of protocols. • Limited ongoing assessments of effectiveness of interventions.

		<ul style="list-style-type: none"> • Limited audits of completion of forms and assessments and limited feedback provided.
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<p>Ecological Context: Macro level</p>	<ul style="list-style-type: none"> • Strong organizational support for success of the unit. • Strong organizational financial support of the unit. • Organizational support for evidence-based practice. • Strong leadership support of physical environment and new technology implemented. • Verbalization of strong leadership support of frontline staff. • Leadership strongly motivated by external recognition of success of program. • Individualization of care plans with collaborative problem solving meets TJC and behavioral health standards of care. • Emphasis on economic success driven by patient satisfaction. 	<ul style="list-style-type: none"> • Limited hospital leadership understanding of behavioral health nursing practice and outcomes. • Limited hospital leadership interest in new care model and its implementation. • Limited hospital leadership confidence in behavioral health leadership competence. • Limited hospital leadership understanding of target population and discipline. • Limited hospital leadership understanding of importance of medical director in care model. • Limited physician support of the care model. • Overall inflexible hospital culture that promotes rules and compliance. • Limited hospital leadership
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	<ul style="list-style-type: none"> • Internal and external collaborators vested in success of unit. 	<p>understanding of the care model.</p> <ul style="list-style-type: none"> • Failure of behavioral health leadership to educate hospital leadership and other stakeholders about the new care model.
Ecological Context- Micro	<ul style="list-style-type: none"> • Parental support of the care model. • Patient satisfaction with the care model. • Physical environment that fosters patient participation in the care model. 	<ul style="list-style-type: none"> • Lack of patient trust. • Lack of parental trust.
Target population	<ul style="list-style-type: none"> • Patients physically available to participate in the collaborative problem-solving process. 	<ul style="list-style-type: none"> • Patients may not be healthy enough (catatonic or psychotic etc.) to participate in the collaborative problem-solving process.

Change model

This assessment uses a linear model with a single determinant for outcome evaluation (Chen, 2012). Literature shows that when this care model incorporating collaborative problem solving is successfully implemented, the use of seclusion and restraint on adolescent psychiatry units is decreased (Bonnell et al., 2014) (Ercole-Fricke et al., 2016) (Greene et al., 2006) (Martin et al., 2008) (Pollastri et al., 2016) (Pollastri et al., 2013) (Regan et al., 2017) (Valenkamp et al., 2014). The single determinant for

successful implementation in terms of outcomes is the use of seclusion and restraint. Seclusion and restraint data was gathered for adolescents when the organization was providing inpatient adolescent care from 2009-2011. The organization subsequently discontinued adolescent inpatient psychiatry care until the new unit opened in July 2018. Seclusion and restraint data from 2009-2011 was compared to data from the first full 6 months following the opening of the new unit in July 2018. When examining the data for seclusion and restraint, the findings were significantly different when separating the elements of seclusion and restraint. Restraint is used only when a patient presents an imminent danger to him or herself and usually restraint is used when a patient is actively self-harming and cannot be protected without the use of restraints. For many patients, this self-harming is head banging or punching walls or engaging in some other behavior that cannot be prevented by secluding the patient in a quiet room with no access to anything or anyone other than self to harm. The episodes of restraint from 2009-2011 were quite small –a total of 6 episodes of restraint during the entire three-year period with calculated rates of 2009: 0.8436 hrs/1000; 2010: 1.1135 hrs/1000; 2011: 0.2772 hrs/1000. Standard measure for rates of seclusion and restraint is hours per 1000 hrs of patient care. To calculate rates, the total number of hours a patient was in restraint was divided by the total number of hours of care provided (patient days multiplied by 24 hours). For the first six months of the opening of the new unit, there were 8 episodes of restraint with a calculated rate of 0.49828 hours per 1000 hours of care. When completing a two tailed *t test* comparing the means of years 2009-2011 to the first 6 months after opening the new unit, the *t*-value is -0.530591 and the *p*-value is 0.618414. The result is not significant as the *p*-value > .05. The small *t*-value and the relatively large *p*-value indicate that

episodes of restraint and rates of restraint were unchanged with the opening of the new unit and the introduction and implementation of the new care model.

When examining the data for seclusion, one finds a different result. From 2009-2011, there were 42 episodes of seclusion representing rates for 2009: 12.3569 hrs/1000; 2010: 3.8678 hrs/1000; 2011: 1.4259 hrs/1000. For the first six months after the opening of the new unit, there was only one episode of seclusion representing a rate of 0.018 hrs/1000 hrs. The *t value* is -206.652941 and the *p-value* is <.00001. The result is significant as the *p-value* is less than .05. This reduction in seclusion is significant. A reduction in seclusion represents at a least a partial success in implementing the new model of care as it relates to the specific measure.

Limitations:

Due to the relatively small amount of data for seclusion and restraint both in adolescent psychiatric care from 2009-2011 and on the new unit, the statistical analysis, while showing significant results, may not present as robust results as if more data were available. The decrease in seclusion does appear to be significant despite the relative weakness of the statistical analysis. The demonstrated reduction in seclusion may represent a partial successful implementation of the care plan, but could also be reflective of the staff attitudes on hire when each was hired with receptivity and dedication to the reduction of seclusion/restraint on the new unit.

Conclusion

The implementation of the care model was a partial success. It succeeded in reducing the use of seclusion on the new unit compared to the use of seclusion for

adolescents from 2009-2011 ($p < .00001$ for reduction in seclusion; $p = 0.618414$ for restraint). It did not however, succeed in reducing the rate of restraint. There were significant opportunities in the implementation of the care model to improve the success of its' implementation. The care model itself represented a significant departure from the overall culture of the hospital and without a significant effort to educate hospital leadership and other stakeholders and secure their support, the implementation was challenged both by its inability to secure the resources needed, such as leadership support and ongoing training, and to support staff as they engaged with the target population in implementing the model. Without hospital recognition that this new unit represented a new service, a new population and a new care model, hospital leadership failed to provide necessary resources for initial and ongoing training and behavioral health leadership failed to educate and engage hospital leadership in way that would encourage and facilitate the support necessary. Both leadership support and ongoing training have been identified as critical in implementing this care model (Caldwell et al., 2014) (Bryson et al., 2017) (Goulet et al., 2017).

Despite these challenges, the implementors (nurses and mental health techs primarily) succeeded in partially implementing the care model. The implementors represented a major strength in the program implementation first through their hire that specifically focused on their receptivity to the care model, their critical thinking skills, their enthusiasm for the care model and their dedication to engage with the target population with collaborative problem solving to reduce seclusion and restraint. The initial training provided to these implementors along with the knowledge, dedication, and mentorship of the clinical educator sustained the implementation of the care model

despite the lack of ongoing training and support. This retrospective review only addressed the first 6 months of the implementation of the care model. The continuation of this model will depend on the continued dedication of the staff along with leadership support and the implementation of an ongoing training program to continually reinforce the difficult skills required to successfully implement collaborative problem solving. The tremendous reduction in the use of seclusion demonstrates that the staff succeeded in providing care that successfully reduced re-traumatization of patients and at least partially implemented a collaborative problem-solving approach that reduced restraint and improved care.

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