An evaluation of the efficacy of the six core strategies intervention to reduce seclusion and restraint episodes in an acute mental health unit.

Trish Wolfaardt

A dissertation submitted to Auckland University of Technology

In partial fulfilment of the requirements for the degree of Bachelor of Health Science Honours (Psychology)

2013

School of Psychology

Primary supervisor: Dr Kirsten van Kessel

Table of Contents

List of Figures

List of Tables

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgments) nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Date: 12/11/13

Signed: *Irsih Wolfaardt*

Acknowledgements

Abstract

This retrospective case study examines the efficacy of the of National Association of State Mental Health Program Directors six core strategy intervention including sensory modulation to reduce seclusion and restraint practices within an acute mental health inpatient unit. The six core strategies intervention is based on a trauma-informed model of care and assumes a recovery orientation. Clinical staff received training in August 2010, and the six core strategies intervention was implemented in September 2010. Clinical data was reviewed for a three year period, and analyzed to determine whether a significant reduction in the number of seclusion and restraint episodes occurred post-intervention. Sensory modulation was evaluated as a tool to reduce service user's distress levels, and staff attitudes towards seclusion practices were examined. The findings showed that post-intervention seclusion was nearly omitted and a trend in the data suggests that the rates of restraint reduced as well. Sensory modulation was significantly effective in reducing service user's levels of distress, and the examination of staff's attitudes showed interesting results with mixed views reflected on seclusion practices. The six core strategies intervention was effective in reducing seclusion and restraint episodes within the acute mental health setting.

Introduction

Seclusion and restraint practices have been used in acute psychiatric settings to manage challenging behaviour for decades. Seclusion and restraint practices were initially based on literature findings that stemmed from beliefs that seclusion and restraint practices "promoted a safe environment" and "were only used as a last resort" (Huckshorn, 2004). The Health and Disability Service Standards define seclusion as "where a consumer is placed alone in a room or area, at any time and for any duration, from which they cannot freely exit" and restraint is described as either one or more physical, mechanical, chemical, environmental, psychological , and possibly financial restriction (Mental Health Commission, 2004, p.1).

Seclusion and restraint practices have been traditionally used within psychiatric inpatient units to moderate service users challenging behaviour, or to manage potential self-harm. For purposes of this dissertation report the generic term 'challenging behaviour' will reflect behaviour that the Ministry of Health (2010, p. 5) deems appropriate to place a service user within seclusion:

a)   The control of harmful behaviour occurring during the course of psychiatric illness that cannot be adequately controlled with psychological techniques and/or medication

b)   Disturbance of behaviour as a result of marked agitation, thought disorder, hyperactivity or grossly impaired judgment

c)   To reduce the disruptive effects of external stimuli in a person who is highly aroused due the their illness

d)   To prevent harmful or destructive behaviour, using indicators of impending disturbance which may be identified by either the individual or staff, and which should wherever possible be part of an agreed management plan.

Today no rationale is seen in literature for the use of seclusion, rather considerable evidence illustrates "the subjective decision-making in imposing this often violent, restrictive and dangerous intervention" (Huckshorn, 2004, p. 24). Historically opposed views have debated that seclusion is a valid treatment intervention which manages agitation and moderates sensory input (Grigson, 1984), others argue that seclusion is a 'treatment relic of the past' and an 'embarrassing reality' (Pilette, 1978, Soloff, 1979; cited in Mental Health Commission, 2004). More agreement between

these views exists today. Seclusion is harmful, does not support recovery, and questions both moral and ethical issues in terms of Human Rights Principles (Mental Health Commission, 2004).

Legally seclusion may be administered under the Mental Health (Compulsory Assessment and Treatment) Act 1992, yet it is emphasized that seclusion should only be used when all other interventions have been tried with little success. The duration which service users are placed in seclusion should be for as short-a-time as possible, and except in an emergency, seclusion should only be enacted upon under the authority of a responsible clinician (Ministry of Health, 2010).

The term restraint seems to be used rather loosely within literature, often having multiple meanings. The New Zealand's Ministry of Health Restraint Minimization and Safe Practice Standard (2001) defines seclusion as a form of restraint. Other terms of reference define restraint as a strategy to achieve a certain goal rather than a form of treatment, a "physical intervention responding to challenging behaviour which involves some degree of direct physical force to limit or restrict movement or mobility" (Harris et al., 1996, p. 100). This form of restraint poses risk to clinical staff.   Nearly a quarter of the injuries sustained by clinical staff within an acute setting were acquired whilst physically intervening/restraining service users; physical assault, collisions with objects in the environment, or musculoskeletal strain from exerting force were most common (Lancaster et al., 2008; Hollins, et al. 2011). Like seclusion, restraint should also only be used when there is no alternative to minimize a behaviour (National Association of State Mental Health Program Directors, 2003, 2009; Health and Disability Services Restraint Minimization and Safe Practice Standards, 2001).

The practice of seclusion and restraint is based on the rationale that service users displaying challenging behaviour require supervised containment and isolation within a controlled restrictive environment (Mental Health Commission, 2004). This rationale contradicts the rationale of a trauma informed and recovery model of care (Anthony, 1991). Seclusion and restraint re-traumatizes service users and promotes feelings of isolation, helplessness, punishment, anger, confusion, and frustration (Champagne & Stromberg 2004). Seclusion and restraint is punitive and does not consider the context of behaviour to promote a positive outcome. This has led to an

increasing concern over the ethical practice of using seclusion and/or restraint as a means of intervention.

In the last decade, the United States has set a precedent for the amendment of Federal rulings around protocols for the administration of seclusion and restraint practices within children, adolescent, and adult psychiatric inpatient units (Huckshorn, 2004). Concerns raised by both medical practitioners and service users report that seclusion is traumatizing and aversive, with both physical and psychological affect (Ministry of Health, 2010; Azeem, et al., 2011). Seclusion and restraint practices promote challenging behaviour, causes conflict between clinical staff and service users, and violates recovery potential (Hamner et al., 2011). "Seclusion is not a treatment … (but) … an inappropriate intervention of last resort" (Mental Health Commission, 2004, p.1).

Literature Review

Managing challenging behaviour

Traditionally, de-escalating techniques including the use of PRN medication have been initially used to manage challenging behaviour with limited effect. De-escalation supports a top-down efferent model which suggests that aggression stems from the brain, with thoughts shaping emotion and expressed as aggression (Beauchaine, 2001). This rationale is illustrated in clinical staff de-escalation training, in which escalation is measured across a continuum from anxious, to agitated, to verbally or physically threatening, to displaying lethal behavior. Literature shows that a verbal intervention like de-escalation is primarily used to manage challenging behaviour prior to secluding service users. However traditional de-escalation when used as a stand-alone intervention, does not promote self-regulation and has limited outcome potential for recovery (van der Merwe, Bowers, Jones, Muir-Cochrane, & Tziggili, 2009). Multi-faceted or broad-based programs on the other hand, educate staff about de-escalation, but also consider environmental, managerial, policy changes such as leadership involvement, organizational and cultural change, policy-change, debriefing, consumer/family involvement, and trauma-informed care (Johnson, 2010; Scanlan, 2010; Gaskin et al, 2009). These strategies include addressing the complexities of the challenging behavior, and the decision-making processes that clinical staff are required to make when intervening (Delaney, 2006). An understanding of a service user's history, traumatic

experiences, loss of dignity, and other psychological harm is required in order to fully comprehend what might be causing/contributing to the challenging behaviour (Blanch, 2003). Van Kessel, Milne, Hunt and Reed (2012) examined the frequency of violence within a New Zealand adolescent inpatient unit and found that understanding what provoked the violence assisted staff in identifying and managing the violent episodes. This understanding provides a contextual frame of reference. As multi-faceted programs include trauma-informed care there is greater outcome potential for reducing seclusion and restraint use (Bowers, 2010; Scanlan, 2010; Borckardt, 2011; E-Morris, 2010).

A Trauma-informed and recovery model of care

A trauma-informed model of care considers development, the well-being and quality of life of a person. It appreciates the effects of traumatic life events and its relationship to mental health disorders, and acknowledges the implicit re-traumatization, loss of dignity and psychological harm that seclusion practices prescribe (Achieving the promise, 2003). A trauma-informed recovery model is person-centred, and requires an understanding of arousal, the reasons for the aggressive behaviour, clinical staff's perceptions and patient's response (Olofsson & Norberg, 2001). Acknowledging the principles of trauma informed and recovery focused care requires that clinical interventions promote a therapeutic environment that supports, teaches and validates positive outcomes central to recovery (Epower & Associates, 2013).

Anthony (1991, 1993) introduced the term 'recovery' to guide the mental health system after reading and listening to consumers' stories of struggle through, and recovery from, mental illness. Anthony (1991, 1993) emphasized that an understanding of the intense emotive behaviour of service users during recovery is required, and clinicians need to work collaboratively with service users so that they proceed to conceptualize, set and reach recovery goals. "The consumer-centred recovery philosophy is the umbrella over all models, disciplines, practices, and activities in the hospital and the community" setting (Barton, 1998, p. 177). The term recovery means 'to get back: regain or restore (oneself) to a normal state" (Webster's II New Riverside University Dictionary, 1984, cited in Ralph, 2000, p. 7). It is a process in which adaptation, coping and a sense of control is developed. Seclusion and restraint practices abolish all potential for the development of these skills and the strategies required for positive outcomes.

A trauma-informed and recovery model of care needs to be applied to seclusion and restraint reduction, yet this requires a shift in philosophy which embraces understanding, shows commitment to practice, and reflects organization in the approach to working with service users. A philosophical foundation that includes "the interpersonal, organizational, and environmental elements that contribute to building a culture of safety" is imperative (Goetz & Taylor-Trujillo, 2012, p. 97). In order to reduce seclusion and restraint occurrences, a shift in focus from the individual to the therapeutic environment is paramount (Gerace, Mosel, Oster, & Muir-Cochrane, 2012; Paterson & Duxbury, 2007).

The six core strategies

In response to a national drive to reduce seclusion and restraint rates in America, the American National Association of State Mental Health Program Directors (NASMHPD) developed a six core strategy curriculum based on a multi-faceted framework, as a template or monitoring tool that provided a shift in culture to guide a seclusion and restraint reduction plan based on a trauma informed care and recovery model of care. Six core strategies were determined as follows (Huckshorn, 2005):

i)   Leadership towards organizational change

An executive leadership team provides guidance, direction, participation and review of the philosophical change that supports a mission statement of recovery within an environment free from violence and coercion, and that is safe for service users and staff through accountability and competency.

ii)   Using data to inform practice

Continually monitoring and evaluating trends in data on frequency, duration and time services users spend in seclusion and/or restraint, including noting prevalence for particular behaviours during certain shifts or at particular times of the day. This data is then used as a measurement to provide goal-specific changes for improvement.

iii)   Workforce development

To provide an environment in which staff are competent in the delivery of trauma-informed care with a recovery focus, so that all policies, procedures and practices reflect an understanding of the broader contextual factors that impact service users.

iv)   The use of seclusion and restraint reduction tools

Staff training in sensory modulation with an understanding of the previous intervention tools that service users have responded to for de-escalation, risk, self-management and comfort, promotes staff to support access to sensory rooms instead of having to be placed in seclusion and restraint.

v)   Consumers roles in inpatient settings

Ensuring that service users are involved in all decision-making processes at both individual and operational levels, promoting full integration between clinical staff and service users.

vi)   Debriefing techniques

Using the knowledge gained during a seclusion and restraint episode to inform policy, procedures and practices, and to provide an opportunity for staff, service users and witnesses, to express any concern to reduce possible negative effects.

Sensory modulation

Sensory modulation has emerged as an alternative way to manage distress and challenging behaviour (O'Hagan, Davis & Long, 2008). Sensory modulation is a sensory-based intervention that helps de-escalate aroused states and reduces clinical staff's need for restrictive practices (Sutton, Wilson, Van Kessel, & Vanderpyl, 2013). In alliance with trauma informed care, sensory modulation through the use of sensory equipment within an appropriate environment, allows service users to reduce levels of agitation and aggression (Champagne, 2008, Champagne & Stromberg, 2004). Sensory equipment is varied and may include weighted blankets, massage chairs, aromas, music or tactile objects (National Centre of Mental Health Research, 2012).

Sensory modulation is based on the theory that facilitating a change in an arousal state, with a significant change in cognitive, perceptual and emotional distress, will reduce the number of seclusion and restraint episodes within acute settings (Huckshorn, 2004). Examining the use of a sensory room within an inpatient service, Swadi and Bobier (2012) found that service users were better at regulating their emotional behavior thus agitated and aggressive episodes were reduced. Sensory modulation helped service users create a sense of safety, through grounding sensory input and provided a sense of containment (Kinnealey & Fuiek, 1999; Kinnealey, Oliver, & Wilbarger, 1995; Pfeiffer & Kinnealey, 2003). Sensory modulation promotes a collaborative management of behaviour, facilitates a sense of calm which shifts service users' attention from their distressed

emotional state to their bodies and environment, and is efficient for regulating emotional distress (Sutton et al., 2013). Sensory modulation offers service users transferable self-help skills to support recovery, and improves self-concept and interpersonal quality of life (Markowitz, et al., 1996)., When used within the six core strategies, sensory modulation clearly fits within a trauma informed and recovery model of care.

Outcome studies

An overview of research measuring outcomes of the effectiveness of the six core strategies intervention with sensory modulation is limited, however extensive research considering the traditional and multi-faceted educational programs to reduce seclusion restraint is evident (Johnson, 2011; Scanlan, 2010). The limited amount of research is not surprising as most evidence has been supported by retrospective case-studies rather than randomized controlled trials (Gaskin et al., 2007; Scanlan, 2010). Randomized controlled trials like systematic reviews are difficult to generalize to other inpatient settings due to many differentiating factors present across units (Johnson, 2010).

Van der Merwe et al's. (2009) systematic review identified 115 international intervention studies aimed at reducing seclusion rates within an acute or Intensive care (ICU) wards. Of these, nearly half used retrospective analyses of clinical documentation and ten studies measured the effectiveness of the multi-faceted approach. The findings of these studies showed that changing the ward environment, having more staff on duty, and improved communication had a positive effect on seclusion rates. However, bias in the mixed data of patient and event-based rates collected from different samples for different lengths of time was evident in the variance of outcomes.

Scanlan's (2010) systematic review of outcome literature evaluated evidence-based guidelines. Of the 29 papers reviewed, 23 specific programs were analyzed. The author concluded that in addition to a multi-faceted approach, a broad-based program that addressed seclusion and restraint reduction from many perspectives, together with local executive and state support, had optimal outcome potential. Many of these themes seem evident in the Six Core Strategies Intervention Program.

The Six Core Strategies and sensory modulation Intervention Program, NASMHPD appears to be effective in reducing seclusion and restraint. A pilot project to test the program examined teams across 25 states in America. Of the teams that were trained in the six core strategies intervention, eight provided seclusion and restraint data prior-to and after the training of staff. Findings of these eight studies showed a 79% reduction in seclusion and restraint hours, and a 62% reduction in the number of service users requiring seclusion and restraint (Conley, 2004, cited in Huckshorn, 2004).

Similar results occurred during Azeem et al's. (2011) retrospective evaluation of the effectiveness of the six core strategies intervention to reduce the rates of seclusion and restraint with hospitalized youth from July 2004 to March 2007. Seclusion and restraint episodes reduced from 93 (73 seclusions/20 restraints) episodes recorded in the first six months of the study to 31 episodes (6 seclusions/25 restraints) recorded for the last six months. Interestingly, the authors do not question the validity and quality of the study but do make comment that the results may have been biased by a concurrent dialectical behaviour therapy initiative.

Further supporting the six core strategies intervention, a New Zealand study conducted by Sutton, Wilson, Van Kessel, and Vanderpyl (2013) evaluated the impact of a pilot sensory modulation intervention introduced within four (three adult and one youth) mental health inpatient units. The aim of the study was to provide an inductive qualitative analysis of the staff and patients' views of applying sensory modulation as a form of de-escalation. A sensory room (a designated space) was provided with a wide range of sensory equipment available. All patients were oriented to the sensory room at time of admission and staff were trained in the sensory modulation approach. Staff offered use of the sensory room to service users, once early signs of arousal were seen, offering inpatients a choice of the use of a wide range of sensory objects. The findings showed that the service users reported that sensory intervention promoted a calm inner state and gave them a sense of control, it enhanced interpersonal relationships between the clinical staff and inpatients, and taught self-management and regulation tools that could be transferred to other settings. The authors concluded that sensory modulation is an effective tool to reduce aroused states and manage challenging behaviour, but acknowledge the need for further research to empirically validate how sensory modulation impacts arousal and emotion within psychiatric inpatients due to the uniqueness and variability of mental health settings.

Novak, et al. (2012) conducted a pilot study to examine the effectiveness of a sensory room in reducing seclusion rates. Service users and staff rated distress levels and behaviour both before and after use of the sensory room. Whilst the results showed a significant improvement in levels of distress, females reported greater improvement (83%), whereas sensory modulation seemed to have a limited effect for male service users. As a result no significant change in the rates of seclusion were noted. Further exploration of the gender effects on the use of sensory modulation may help to explain the limited outcome for males.

In summary, research has shown that the six core strategies intervention with sensory modulation appears to be effective in reducing seclusion and restraint practices, and that sensory modulation is an effective tool to manage challenging behavior. However, a number of limitations have been identified:

- An inconsistent definition of seclusion and restraint was identified within the case-studies.
- Seclusion and restraint practices were often not differentiated from acute and PICU wards
- Seclusion episodes are measured and reported in two different ways, either per patient or seclusion-event. Patient rates did not include repeated seclusion episodes and event-based rates did not acknowledge the number of service users, thus repeated seclusion episodes may have been included more than once.
- Most of the studies report possible bias within their results
- All the co-variants that may have been responsible for the seclusion reduction are not measured.

In conclusion, most of the studies completed were retrospective analyses of clinical data hence the direction of any relationship within the data is difficult to determine, and the effect of multiple confounds are difficult to control. A future randomised control trial would overcome many of these limitations and provide of significant insight to the efficacy of the six core strategies intervention.

Use of Seclusion in NZ

In 2009 an international study done by van der Merwe et al (2009) studied internationally the use of seclusion and restraint within mental health facilities. Their findings showed that New Zealand had low patient-based seclusion rates (15.58 patients were secluded per 100 admission per month) and service users were secluded on average twice, and for an average duration of 14 hours. These results were further supported by Tyrer et al. (2012) who noted that service users were placed in seclusion for a long duration within adult in-patient services when compared to other countries.

This extensive use of seclusion in NZ raised the concerns of clinicians, service users and researchers, and led the Mental Health Commission (2001), with the support of the Ministry of Health, to conduct a review of seclusion practices from a human rights, policy and practice perspective within New Zealand District Health Boards.

This review undertaken by The Mental Health Commission showed a wide variance in seclusion practices across DHB's. The findings showed that 37% of service users were placed in seclusion, and the decision to seclude was influenced by systemic, resourcing, management and policy constraints. Most service users spent an average of 50 hours per month (range of 1 to 600 hours) in seclusion, with durations between 8 and 24 hours. Male and female seclusion rates were the same, but Maori tended to be secluded more than other ethnicities. These results do not support the Ministry of Health's mandate for all acute mental health inpatient units to work within the trauma informed and recovery model of care (Mental Health Commission, 2004).

The Mental Health Commission therefore produced a report examining the "magnitude" of these seclusion practices by considering "the context of the acute unit" and "investigate[d] arguments surrounding human rights, duty of care, and therapeutic value" (Mental Health Commission, 2004, pg4). This report promoted a more conducive trauma-informed recovery model of care and prompted the Ministry of Health to focus on a national plan to reduce seclusion and restraint.

In response, Te Pou, the New Zealand National Centre of Mental Health Research (2010), identified that sensory modulation implemented with the six core strategy intervention, would be an effective intervention to promote a cultural change to reduce seclusion and restraint practices.

This recommendation was implemented by the leadership team at a mental health inpatient unit in New Zealand, in order to develop the NASMHPD (2006) seclusion elimination plan. The focus of this implementation plan was to support a change in culture through changing attitudes to everyday practices, and to promote use of sensory modulation to reduce the number of seclusion and restraint episodes.

An overview of the Implementation of the six core strategies

After extensive consultation within a steering group comprising of WDHB senior management, consumer advisors, and the unit's leadership team (charge nurse manager, clinical charge nurse, clinical nurse specialist, and lead occupational therapist), the six core strategies to reduce seclusion and restraint was implemented in September 2010, post staff training . A developmental approach to the implementation over three years was taken by the leadership team due to the progressive nature of the intervention, and the engagement of a number of stakeholders to provide staff training and insight. The goal was to reduce seclusion rates each year, until seclusion was finally omitted. Two sensory rooms were opened, one in the open ward and a seclusion room was converted to a sensory room in the intensive care unit.

The current study – Aims and objectives

The overall aim of the current study is to evaluate the effectiveness of the implementation of the six core strategies intervention with sensory modulation to reduce the number of seclusion and restraint episodes at a New Zealand Mental Health Inpatient unit.

The current study will address the following objectives:

1) Seclusion and restraint

- To evaluate if there is a significant reduction in the number of seclusion and restraint episodes after the introduction of the six core strategies intervention, and sensory modulation

2) Sensory modulation

- To evaluate the effectiveness of sensory modulation as tool to reduce distressed and aroused states
- To evaluate whether the length of time spent in sensory room improves service user's ratings scales.

- To identify the preferred sensory modalities used

3) Staff attitudes
- To evaluate whether staff attitudes towards seclusion and restraint have shifted pre-and-post the implementation of the six core strategies intervention with sensory modulation

4) PRN medication
- To evaluate any changes in the use of PRN medication post the implementation of the six core strategies intervention.

This study will make a valuable contribution to the limited pool of knowledge on the effectiveness of the six core strategy intervention with sensory modulation in reducing seclusion and restraint.

Method

This retrospective case study used information from a New Zealand 32 bed in-patient psychiatric unit that provides service to adults aged 18 to 65. Clinical staff collated data over a three year period from 2010 to 2012 inclusive. An increasing high turnover in the number of service users was evident, with no indication of the number of readmissions (Table 1). No gender or ethnicity data was provided with the admission data.

Table 1
Monthly admission rates to the acute inpatient unit

Month	2009	2010	2011
January	46	44	51
February	35	44	44
March	30	37	43
April	32	35	44
May	31	35	44
June	30	39	39
July	41	39	46
August	35	37	53
September	42	48	51
October	34	21	47
November	38	50	49
December	26	42	45
Total	420	471	556

Note. 2009 = pre-intervention, 2010 = post-intervention 1, 2011 = post-intervention 2

All clinical staff working at the unit participated in implementing the six core strategies intervention in September 2010. A leadership team, committed to the development of the seclusion and restraint reduction plan for better outcomes for service users was identified and consisted of a Senior Occupational Therapist, Clinical Nurse Specialist, Manager and Senior management of the district health board's mental health services. The team was supported with registered nurses, healthcare assistants, social workers and occupational therapists. A Consumer and Cultural Consumer Advisor were appointed.

Procedure

Retrospective data was collated from clinical records and procedural documentation compiled by clinical staff, outlining the protocols required to be taken with the implementation of the six core

strategies intervention seclusion reduction plan. All staff were introduced to the procedural documentation at the training day in August 2010. Staff training was comprehensive and included teaching on the trauma informed model of care, the new seclusion procedures, acute behaviour disturbance guidelines (PRN medication), early intervention with effective communication and de-escalation, and sensory modulation. The six core strategies training promoted that all clinical staff within the unit proactively respond to every seclusion episode according to the procedures and documentation outlined in the seclusion reduction plan.

Training also included an overview of the function of sensory modulation as a means to reduce levels of arousal, and effective sensory modalities. Staff were advised of sensory modulation practice guidelines including the sensory rooms, weighted modalities, safety, infection control, and the sensory preference form (Appendix A). One of the Unit's goals was for the occupational therapist to complete a sensory preference form within 72 hours of admission. The sensory preference form identified service user's sensory triggers, early signs of sensory overload, and preferred sensory based strategies.

Data Collection

All retrospective data had been previously collected by the leadership team over the duration of the project (2009, 2010, and 2011) and was provided to the researcher on excel spreadsheets and word documents in the form of charts and graphs, with limited supporting raw data.

1. Seclusion and restraint

Both pre-and-post intervention seclusion and restraint data was collated from routine seclusion authority forms which detailed the date, time and duration of seclusion. A seclusion register noted the service users name and times seclusion started and finished, detailed descriptions of how alternative interventions were used, and the rationale to continue seclusion. The data, including the procedural restraint data (restraint required to administer medication) were presented monthly for the whole unit with the duration and time of the seclusion episode tabulated in hourly increments over a 24 hour period from midnight to midnight.

2. Staff's attitudes

All staff were offered an opportunity to complete the Heyman's (1987) "Attitudes towards seclusion questionnaire" (Appendix B), both pre-and-post intervention. The pre-intervention questionnaire, completed on the training day in August 2010, consisted of 12 questions to determine staff's opinions, beliefs and feelings about the use of seclusion, and the possible changes that could be made to the seclusion process. Questions and answer formats varied. Certain questions required a 'yes' or 'no' answer (questions 6, 8, 9), and some questions required staff to choose from the terms 'never', 'sometimes', and 'often' (questions 5, 7, 10, 11). The remaining questions provided a selection of responses (questions 1, 2, 3, 4).

The post-intervention questionnaire completed early 2012, was a revised edition of the pre-intervention formation. Three questions, question two "the average length of seclusion", question three "time in seclusion for effectiveness", and question four "time most likely to be secluded" were deleted.

Both questionnaires ended with three concluding questions, 'is seclusion therapeutic', 'is seclusion punitive', and 'is seclusion necessary', of which staff rated their responses on a 10-point Likert Scale, ranging from 1 (not at all) to 10 (very). The post-intervention questionnaire had a further question "did you take part in the original training' for staff to complete as either 'yes' or 'no'. It was deemed necessary to include this question due to many new staff having been recently employed.

Heyman's (1987) "Attitudes towards seclusion questionnaire" has been cited by many researchers, with comment of it being a standardized questionnaire with test-retest reliability of 0.62 to 0.79 (Meehan, et al., 2004; Wynaden, et al., 2001; Allen, 2000), yet on investigation for a source document, one was not able to be located. The clinical staff reported that the Heyman's (1987) questionnaire was acquired from their local District Health Board, where it had been previously used successfully to measure staff attitudes.

3. Sensory modulation

Sensory modulation data was collated from both the open and ICU wards and included a self-rating scale completed by service users to rate their level of arousal prior-to and post use of the sensory room. Data was also gathered from a guest book located in the sensory room, which was available for service users to comment about their experience, the sensory modality used, and the length of time they spent in the sensory room.

4. PRN medication

Data was provided from computerized pharmacology documentation both pre-and-post intervention, documented yearly for 2010, 2011, and 2012. The total number of medications dispensed was categorized according to their medication type; Lorazepam, Olanzapine and Quetiapine, and their various strengths.

Data Analysis

For analysis, all data was reorganized by the researcher and documented as pre-intervention baseline data for the period August 2009 to July 2010, and two years post-intervention data from August 2010 to July 2011, and August 2011 to July 2012. The Statistical Package of Social Sciences version 20 (SPSS V20) was used to measure the quantitative data. Using descriptive statistics, measures of central tendency were measure with frequency distributions. A positively skewed result determined the need for non-parametric testing even though non-parametric testing has less stringent criteria (Pallant, 2007).

The reduction in the number of seclusion and restraint episodes was not statistically tested due to the progressive nature of the intervention over the three-year period and the likely influence of many extraneous variables like staff turnover, service user turn-over, service user length of stay and staff training, that may have significantly affected the findings. Pallant (2007) notes that the assumptions for statistical testing suggest that random samples with independent observations (observation that can only be measured once and not be influenced) is preferred. In terms of what we know of the data collated, we could not ensure that these assumptions were not violated. Furthermore due to the small sample size, the increased possibility of Type 1 and Type 2 errors may have resulted in an incorrect interpretation of a non-significant result. According to Cohen

(1988) 17 within group participants and 34 between group participants would be needed to obtain a significant result at an alpha level of .05 assuming a 1 standard deviation effect size and 80% power level.   As our sample is so small, inferential testing may suggest insufficient power, rather than no real difference between the groups (Cohen, 1988).

A Chi-square test (for categorical variables) measured the shift in staff's attitudes pre-to-post intervention, and a Wilcoxon signed Rank Test (for continuous variables) was used to measure the last three Likert scale questions (Pallant, 2009).   A Wilcoxon Signed Rank Test also measured service user's ratings of distress pre-and-post sensory modulation (Pallant, 2009). For all analyses a probability value less than 0.05 was deemed statistically significant.

An inductive qualitative thematic analysis examined staff's comments to the questions on the Heyman' staff attitude survey and service user's comments on their experience with sensory modulation. With a semantic stance, data was organized to show patterns in content and then summarized and coded. Similar to grounded theory, "themes strongly linked to the data themselves" were identified (Braun & Clarke, 2006, p. 83).

Ethics

This retrospective study was an analysis of de-identified data previously collated by District Health Board (DHB) clinical staff and provided to the researcher. An Ethics application was deemed unnecessary by the Auckland University's Ethics Department for this study (FES AUTEC representative, April, 2013). A letter of agreement was signed by AUT and ADHB to formalise the research collaboration and the student researcher signed a confidentiality agreement with the DHB

Results

1. Seclusion and restraint

Descriptive data measured the changes in the use of seclusion post implementation of the six core strategy intervention. Pre-intervention, 172 seclusion episodes were recorded for the year. This number reduced to 46 episode post-intervention, further reducing to 2 episodes in the second year post-intervention. This resulted in the average annual seclusion rate per service user reducing from 40% to 9.8% and .35% respectively. Whilst statistical comparisons were not able to be conducted (see method section) the results do reflect a significant drop in the rates of seclusion which was nearly omitted in the second year post-intervention.

The duration of seclusion also reduced from an average of 19 hours per month recorded pre-intervention to 3.4 hours in the first year post-intervention, and 1.5 hours for the second year post-intervention. Averaged over the three-years the results showed service users were mostly secluded between 2pm and 10pm, with the highest number of seclusion episodes recorded between 4pm and 6pm ($n = 28$). Male service users (71%) were secluded more than female service users (29%).

As the focus of the implementation of the six core strategy intervention was to reduce seclusion and restraint episodes, ethnicity data was only provided for these variables. Maori service users had the highest seclusion rates ($n = 51$) and were more often required to be secluded multiple times than European ($n = 41$), Pacific and Indian ethnicities. Post the implementation of the six core strategy intervention the number and duration of seclusion episodes reduced considerably.

The annual number of restraint episodes were measured annually pre-to-post intervention. From the 83 restraint episodes ($M = 6.9$), or 2.59 per service user, recorded pre-intervention, restraint episodes nearly halved to 49 episodes ($M = 4.08$), or 1.53 episodes per service user, in the first year post-intervention. However, the number of restraint episodes increased to 74 episodes ($M = 6.16$), or 2.31 episodes per service user, in the second year post-intervention. As illustrated in the monthly restraint data in Figure 1, an increasing trend in the rates of restraint from February 2012 (post-intervention 2) is evident.

No gender data was provided for restraints pre-intervention or for the first year post-intervention, however the second year post-intervention (from January 2012) showed that of the 120 restraint

episodes, female service users (58%) were restrained more than male service users (43%), but more male service users had to be restrained multiple times. Ethnicity data showed that European service users had more restraint episodes than Maori, Pacific, Asian and other ethnicities.
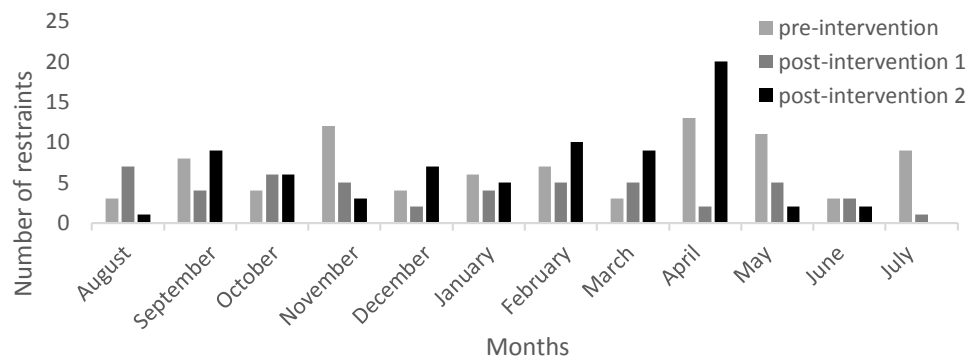
Figure 1. Monthly restraint episodes pre-intervention and two years post-intervention

Staff attitudes

A Chi-square test was performed to evaluate potential changes in clinical staff's attitudes to the reduction of seclusion pre-and-post the implementation of the six core strategies intervention. So as to not violate the assumptions of the Chi-square test, where applicable the 'sometimes' and 'often' responses were combined, and response frequencies of five and less were deemed not applicable. All staff who attended the training day were requested to complete the pre-intervention questionnaire however participation was voluntary. The requirement of a post-intervention questionnaire was not predetermined, however due to a large intake of new staff in January 2012 it was included. As a result a proportion of staff whom completed the post-intervention questionnaire completed it for the first time. The varied format of each of the questions on the questionnaire resulted in varied response rates, with a higher overall response rate evident for the post-intervention questionnaire. Due to this variation, each of the questions on the questionnaire were measured and interpreted individually.

1. Who decides on the use of seclusion

Similar responses pre-to-post intervention were obtained from staff in regards to whom the decision makers were on the use of seclusion (Table 2). No significant association, was obtained $(X^2(6, n = 4) = 8, p = .238)$. Registered nurses were viewed to most likely decide on the use of seclusion whereas Social Workers and Occupational Therapist were rated as the least likely to decide on the use of seclusion. Doctors and managers were rated somewhere in the middle, and post-intervention staff thought less service users were likely to decide on the use of seclusion.

Table 2.
Staff's perception on who decides on the use of seclusion?

	Pre-intervention		Post-intervention	
	N	%	N	%
	(*n*= 74)		(*n* = 63)	
Doctor	12	16	7	11
Manager	7	9	7	11
Primary Nurse	19	26	15	24
Registered Nurse	39	53	39	62
Occupational Therapist	1	1	1	2
Social Worker	1	1	1	2
Service User	10	14	2	3
Other	4	5	5	8
Total	125		123	

Note. n = Total number of participants, N = number of responses, % = percentage of total

2. When should service users be placed in seclusion?

Staff were required to select from a list of 17 behaviours when they thought service users should be placed in seclusion, and whether each behaviour was a valid reason to seclude. A greater variation in responses were recorded pre-intervention (M = 38.94, SD = 3.01) even though a higher number of response were recorded post-intervention (M = 44.88, SD = 1.62). More staff also recorded responses whether each of the behaviours was a valid reasons for seclusion post-intervention.

A clear shift in staff attitude pre-to-post intervention was evident when examining each item within this question, with more staff responding post-intervention that seclusion should never be used, despite a non-significant result being determined $X^2(48, n = 11), = 53.33, p = .277$. All staff reported that service users demanding to go to bed, demanding extra food, refusing activities program and demanding to speak with a doctor never warrants seclusion. In contrast, 77 % of staff

thought that a service user striking another client, and striking a staff member (70%), sometimes warrants being placed in seclusion. Staff rated these two behaviours as the most valid reason for seclusion both pre-and-post intervention (Table 3).

Table 3.
Pre-and – post intervention staff attitudes to when should service users be placed in seclusions?

| Criteria | Pre-intervention | | | | Post-intervention | | Valid | | Valid |
	% N	% S	% O	% Yes	% N	% S	%O	% Yes	
Excited or out of control	23	73	5	36	65	35	0	21	
Struck another client	7	65	28	84	19	77	4	66	
Yelling, making noise	61	34	5	6	88	12	0	5	
Struck another staff member	7	45	48	74	22	70	9	66	
Risk of absconding	67	31	3	13	95	5	0	3	
Inappropriate sexual behaviour	31	57	12	45	72	23	4	23	
Demanding to go to bed	95	3	3	0	100	0	0	0	
Trying to break furniture	32	59	10	30	62	36	2	26	
Cursing or swearing at others	58	40	3	6	88	9	2	5	
Annoying or disturbing others	53	33	13	11	96	4	0	3	
Demanding extra food at meal times	97	3	0	0	100	0	0	0	
Disturbing/waking others at night	61	37	3	11	84	16	0	5	
Refuses activities program	100	0	0	5	100	0	0	*	
Refuses medication	58	39	3	10	89	11	0	3	
Demanding to speak to doctor	95	5	0	0	100	0	0	*	
Demanding to go into seclusion	38	62	0	33	57	41	2	10	
Client trying to hurt themselves	43	43	14	32	69	27	4	22	

Note. % N = % Never, % S = % Sometimes, % O = % Often, Total M = Total number of responses **Not provided*

3. Staff's perception of the effects of seclusion on service users

This question examined staff's perception of how seclusion effects service users. Staff were presented with a range of scenarios from which they had to choose that service users never, sometimes, or often felt in a particular way. A significant difference pre-to-post was obtained suggesting a positive change in that more staff felt that seclusion never supports service users X^2 (42, $n = 10$) = 60.00, $p = .035$. In contrast though, no change was found pre-to-post intervention in staff's attitudes towards seclusion being valid when a service user needed help to calm (48%), needed to get away from too much excitement on the ward, and when they felt frustrated (50%). Post-intervention, staff also felt that seclusion made service users feel angry towards staff (50%) and made them feel punished (50%). This suggests that staff (48%) accept that seclusion is not therapeutic but is beneficial at times as service users behave better post seclusion.

4. Can the unit "get along without a seclusion room?

Five scenarios were provided for staff to rate either yes or no whether the ward could manage without a seclusion room. Response rates were similar pre-and post-intervention without a significant difference between staff's attitudes in rating 'yes', X^2 (12, $n = 5$) = 15.00, $p = .241$, and 'no' X^2 (12, $n = 5$) = 15.00, $p = .241$ that the unit could get along without a seclusion room. A shift was evident in staff's choices of what would be necessary for the unit to get along without a seclusion room. Staff initially rated that 'more staff on duty', and 'doctors and nursing staff having more experience in dealing with difficult to manage clients' would positively support not having a seclusion room in the unit, whereas post-intervention staff thought that having 'more male nurses on the ward' and 'nursing staff having more control over prescribing PRN' was beneficial. In summary although a significant result was found the trend in data does suggest that staff had mixed views, the unit could, and could not get along without a seclusion room.

5. Changes in use of seclusion in the unit

Staff were required to rate 'yes' or 'no' whether seclusion should be used 'if service users have had a poor response', if seclusion 'should be abolished' and whether the duration of 'seclusion should be longer than four hours'. In contrast to other questions on the questionnaire, response rates varied and were slightly higher pre-intervention ($M = 45.67$, SD = 7.02) compared to post-intervention ($M = 41.67$, SD = 5.51). No significant difference between the percentage of 'yes' responses X^2 (2, n = 3) = 4.00, p = .135, and 'no' responses X^2 (4, n = 3) = 5.00, p = .287 were evident. Most staff thought that seclusion should not be used when a service user has had a poor previous response (83%), and 74% of staff thought that a seclusion episode should not be longer four hours. Only 50% of staff thought that seclusion should be abolished.

6. Who benefits when clients are secluded?

Staff's responses both pre-intervention ($M = 42$, SD = 10.23) and post-intervention ($M = 47.71$, SD = 12.75) were widely varied. Whilst pre-and-post-intervention staff perceptions showed that the 'client in seclusion', the 'other clients in ward', 'the hospital (security and legal reasons)', and 'nursing staff', 'sometimes' benefited from service users been placed in seclusion, post-intervention responses showed no significant increase in staff's 'never' responses, X^2 (30, $n = 7$) = 35, $p = .243$ and sometimes/often responses X^2 (49, $n = 7$) = 56, $p = .229$. (Table 4). This suggests that staffs views on who benefits from seclusion has had little change pre-to-post

intervention, with staff still viewing other clients on the ward and nursing staff benefiting the most from seclusion.

Table 4.
Who benefits when client is secluded?

	Pre-intervention				Post-intervention			
	T M	% N	%S	%O	T M	% N	%S	%O
Client in seclusion	47	13	79	9	53	21	75	4
Other clients in ward	47	0	64	36	54	6	69	26
Hospital (security & legal reasons)	43	33	49	19	51	39	59	2
Nursing staff	46	9	63	28	54	20	67	13
Medical staff	46	46	39	15	53	49	45	6
Police	46	59	30	11	50	64	28	8
Others	19	37	53	11	19	95	5	0

Note. T M = Total number of responses, % N= % Never, % S = % Sometimes, % O = % Often
Assumes significant level of .05

7. Overall rating of seclusion by nurses or staff?

Using a Likert Scale from 1 (not at all) to 10 (very), staff indicated whether they thought seclusion within the unit was therapeutic, punitive or necessary. With similar response rates staff agreed that seclusion was not therapeutic even though a non-significant result between pre-and-post data was obtained, $z < .001$, $p = 1.00$. Similarly, without a significant result $z = -1.774$, $p = .076$, more staff rated post-intervention that seclusion is punitive, however it is important to note that the number of responses received for this question post-intervention ($n = 27$) was nearly half of the number of responses received pre-intervention ($n = 47$). Staff's ratings of whether seclusion is necessary showed mixed results. With half the number of responses post-intervention, the distribution of scores over the ratings changed as more staff rated on the higher end of the scale that seclusion was necessary with a near significant result, $z = -1.948$, $p = .05$. This suggests a trend in data that shows that staff still feel that seclusion is necessary on the ward.

Staff's comments

A summary of staff's qualitative comments post-intervention supported the quantitative findings on the Heymans staff attitude questionnaire. Three core themes were identified.

i) Staff's concern for safety

Staff's comments illustrate that seclusion is at times necessary, especially when staff and or other service users are at risk. Staff commented as follows:

> *Seclusion should only be used as a last resort, when staff and other client's are at risk, or when limited staff (like during the night) are available.*

> *I think seclusion does have its place, i.e. for druggies, substance use and [the] aggressive, but think police should keep [service users] until more settled.*

> *People who come in under the influence of p-meth [and] alcohol should be dealt with by police first so the worst is out of their system. Security staff have been used to support staff.*

> *The use of seclusion should not be discouraged, rather nurses [need to be] reminded when to use seclusion appropriately. Eliminating seclusion completely is taking away a nursing tool that has proven to be useful and effective in the past when dealing with dangerous behaviours, especially when happening in conjunction with meds being under prescribed, and often understaffed.*

ii)   Staff's understanding that seclusion is not therapeutic

Comments from staff reflect an understanding of the harmful effects of seclusion on service users, and the punitive emphasis that service users place on this experience. Staff state that:

> *Service users felt angry at staff, "pissed off" for secluding them and thought that seclusion was punitive which left them feeling that they were "not important, that nobody cared*

> *Service users felt that they were being placed in a prison cell*

> *Service users should not be secluded for the sake of others*

iii)   Staff's desire for alternative options

Many staff commented on the need for alternative strategies when dealing with challenging behaviour. Staff felt that more training, support and better control over PRN medication use may assist in not having to place service users in seclusion. Staff commented:

> *Better training in managing behaviour, de-escalation and communication*

> *More PRN to be administered*

> *A more supportive team environment*

> *A more one-to-one time with service users*

Sensory modulation

It was hypothesized that sensory modulation would be an effective tool to reduce service user's distress levels, thereby minimizing rates of seclusion. Between March and September 2012, 28 sensory room events on the open ward and eight events on the ICU ward were recorded. Following the use of the open ward sensory room, 14 service users completed a self-rating scale, between 1 (low) and 10 (good) on distress levels. An average improvement of 3.5 points in levels of distress was rated across 14 service users, eight of the 14 service users reported improvement, five reported no change, and one service user reported feeling worse. The Wilcoxon Signed Rank Test revealed a significant reduction in distress across all e 28 service users post sensory room use in the open ward, $z = -4.139$, $p < .001$, with a large effect size ($r = .55$). Service users reported the optimal improvement of five and more in distress levels after 28 minutes of sensory room use.

Limited data collected from the ICU ward showed that three of eight service users rated an improvement in distress levels of more than five points after an average duration of 56 minutes, and three service users rated an improvement of less than five points after an average duration of 28 minutes. One service user rated no improvement and one rated as feeling worse, however no data on the duration was provided. A Wilcoxon Signed Rank Test showed significant reduction in distress levels in the eight service users in the PICU ward, $z = -2.132$, $p = .033$ with a large effect size ($r = .53$).

Preferred sensory modalities were identified from the data collection form. Based on the number of times used in the open ward the massage chair, relaxation CD, weighted blanket, and lava lamps were most commonly used, followed by music, lotion, stressballs, water feature, weighted dog, sweets, lazy boy, sound spa, yuck-e ball and rocking chair. Fewer sensory modalities were available in the ICU ward with the weighted blanket, aromatherapy, wraps and the yuck-e ball mostly used. From the results it can be concluded that multiple sensory modalities are used at any time with the open ward noting use of sensory modalities 229 times (8 per service user), and 102 times (12 per service user) in the ICU ward.

Service users commented in a guestbook how they felt about the use of the sensory room experience. These comments categorized by content of each service user's statement and collated by the clinical staff as positive, negative and neutral comments. Twenty five positive comments were recorded for the open ward, and four in the ICU ward. These positive responses affirmed that the sensory room was effective in reducing distress levels. Service users commented as follows:

> *The sensory room was calming and just what I needed.*
> *A room with surprises. Happy*
> *It was awesome and relaxing .....and the comfort of the heavy*
> *blanket and the furry dog was comforting giving me a warm and*
> *loving feeling*
> *I am calm and at peace*

In contrast however seven service users in the open ward and one in ICU commented negatively about a particular sensory tool not being available or that it was broken. Some of service user's comments were:

> *I could not get relaxation CD to work*
> *We could not find the key to the cart so couldn't use anything*
> *There was too much chatter going on to be able to fully relax*
> *Please get door to room fixed - it bangs when it's windy*

PRN Medication

Alongside measuring the use of seclusion and restraint it was important to review the use of PRN medication as often PRN medication is used as an alternative restraint method (Donat, 2005). Therefore the various medications prescribed were reviewed to determine whether any changes in the amounts of medication dispensed were evident. Some of the medications, Lorazepam IM 4mg and Olanzepin (IM)), decreased post-intervention continuing into the next year, but a significant increase in the total amount of PRN medication administered throughout the unit for three of the six medications dispensed was recorded over the three year period, increasing each year post-intervention. For reasons unknown the administering of Lorazepam (4mg) was stopped, and the quantity of Olanzapine administered intramuscularly (IM) decreased. In contrast however, after an initial decrease, the amount of Quetiapine (100mg) dispensed increased in the second year post-

intervention. In summary the amount of PRN medication substantially increased each year post-intervention with nearly double the amount of medication administered.

Table 5.

Total PRN medication dispensed for the year

	Pre-intervention	Post-intervention 1	Post-intervention 2
Lorazepam 1mg tablets	6302	10095	12330
Lorazepam (IM) 4mg	76	48	0
Lorazepam (IM) 2mg	0	99	148
Olanzapine (IM)	150	104	93
Quetiapine 25mg	1679	1986	2518
Quetiapine 100mg	1935	1781	2659

Note.   Pre-intervention = August 2009 – August 2010, Post-intervention1= September 2010 – September 2011, Post-intervention 2 =September 2011 to September 2012

Discussion

This retrospective case study is the first study in New Zealand evaluating effectiveness of the six core strategy intervention with sensory modulation in reducing the number of seclusion and restraint episodes within an acute mental health inpatient unit. Two years post-intervention data was examined to determine whether a reduction in seclusion and restraint practices occurred, and whether sensory modulation was effective in supporting the seclusion elimination plan.

The six core strategies; leadership towards organizational change, using data to inform practice, workforce development, the use of seclusion and restraint reduction tools, consumers roles in inpatient settings and debriefing techniques were implemented by the leadership team to promote an organizational change in clinical practice. The intervention included a shared vision, extensive training and evaluation, successes were celebrated and progressive development reviewed. Data gathered informed practice around seclusion and restraint episodes, and staff were guided to implement a preventative approach. Trauma-informed and recovery models of care, including de-escalation and sensory modulation were implemented prior to seclusion and restraint practice, and service users and their families were invited to participate in treatment planning. Both staff and service users were required to have debriefing after the use of seclusion and restraint.

Debriefing for both service users and staff is an essential part of the six core strategy intervention as it provides an opportunity for continuous review of service user's and staff's behavioural responses for seclusion and restraint. Huckshorn (n. d.) notes that debriefing includes "providing an analysis of triggers, antecedent behaviours, alternative behaviours, least restrictive or alternative interventions attempted, de-escalation preferences or safety planning measures identified and treatment plan strategies" (Huckshorn, n.d., p. 3). Consistent debriefing would provide an avenue for the maintenance of the six core strategy intervention.

Seclusion and restraint
The six core strategies intervention with sensory modulation was implemented to reduce the number of seclusion and restraint episodes within an acute mental health inpatient unit. The findings showed clear evidence of a reduction in the number of seclusion episodes post-

intervention. Seclusion rates progressively reduced from 172 episodes to 46 episodes recorded during the first year post-intervention, and 2 episodes recorded in the second year post-intervention. These results are consistent with reported literature (Azeem et al., 2011, Conley, 2004, Huckshorn, 2004).

In contrast to literature, most of the seclusion episodes were recorded in the late afternoon early evening. Van der Merwe et al (2009) conducted a meta-analysis of literature which showed that of thirty studies analyzed, only five reported higher seclusion rates during the late afternoon early evening. Seclusion was more prevalent during the day, attributed to the busyness of the ward.

The introduction of the six core strategies with sensory modulation was also associated with an initial decline in the use of restraint in the first year post-intervention, suggesting that it is an effective intervention to reduce the use of restraint. Although, the initial decline was followed by an increasing trend in the number of restraint episodes in the second year post-intervention, it was hypothesized that this increase may have been the result of the minimal maintenance of the intervention strategy in the post-intervention years. It is always essential that when implementing clinical interventions in clinical and health settings, that the intervention is systemically consistent, continuously maintained and integrated into the everyday clinical practice so that the strategies are delivered with integrity. This allows the variability in the effectiveness of the intervention to be understood (Powell et al., 2012). It is also possible that maintaining the spirit of the six core strategies, and the focus on reducing seclusion and restraint, may have faded with time. Furthermore, the large number of staff changes that occurred over the two years post-intervention may have attributed to the increase in the rates of restraint in the second year post-intervention. Staff changes could have resulted in loss of knowledge and experience. We are aware that only 59% of staff that completed the staff attitudes questionnaire post-intervention reported that they had received training at the training day prior to the implementation of the six core strategy intervention. With this in mind, the spike in the number of restraint episodes during February, March and April 2012, with April recording the highest number of restraints over the three year period, could be attributed to the intake of new staff in January 2012. Literature shows that levels of staff education and experience in psychiatric nursing has a significant effect on the rates of

seclusion (van der Merwe et al, 2009), however no literature was found examining correlations between education and experience and rates of restraint (van der Merwe et al., 2009).

It is also important to emphasize caution when comparing results of seclusion and restraint data within literature, as often a clear definition is not determined. As mentioned earlier, the terms seclusion and restraint are often used interchangeably with seclusion viewed as restraint rather than a separate form of containment. Furthermore, results between event and patient based rates are often compared which do not take into consideration repeat seclusion and restraint episodes (van der Merwe, et al., 2009). This may present some bias in the results.

Further consideration of the length of time required between episodes for each of the episodes recorded is required to determine each episode as an independent episode (Van der Merwe, 2009). Whilst data of the number of service users who were secluded and restrained more than once were collated, a clear definition how multiple seclusion and restraint episodes were recorded was not advised. As a result a small number of service users may be responsible for majority of the seclusion and restraint episodes, which may skew the data and provide an incorrect representation of the sample.

In summary, it appears that despite some of the limitations mentioned above, the introduction of the six core strategies plus sensory modulation did appear to have a positive impact on rates of seclusion and restraint.

Staff attitudes
It was hypothesized that the six core strategies intervention with sensory modulation would shift staff's attitudes towards seclusion post-intervention. Staff were requested to complete the Heyman's staff attitude questionnaire (1987) both pre-and-post intervention. A non-significant result was found for all of the questions except staff's perception of how seclusion effects service users, and the majority of staff acknowledged that seclusion was not therapeutic. Half of the clinical staff had opposed views towards seclusion as they reported that seclusion was both necessary but acknowledged that it was punitive.

These results are supported in literature which show that staff have mixed feeling towards seclusion practices. Staff report that seclusion can be beneficial for running the ward more smoothly, and believed that seclusion was therapeutic, but staff experienced regret for having had to place the service user in seclusion, and reported clear descriptions of how service users felt when secluded; sad and depressed and angry (van der Merwe et al., 2009, Stowes, Crane & Fahy, 2002). In this study, a review of the staff's Likert Scale and qualitative responses show that staff view that whilst seclusion reduces concerns for safety, it does promote feelings of guilt, disappointment and frustration.

When reviewing the responses from the Likert Scale, it is good to keep in mind the potential for biased responses. This is not an unusual occurrence when people complete Likert Scales, as people often do not want to appear extreme so respond as they feel that they should rather than rate the question as they strongly feel about it (Davidson & Tolich, 2003). Considering the polarized views of staff in this study, the potential for a biased result seems eminent. Evidence-based literature shows that staff attitude, and the culture of the unit, precedes patient's characteristics when determining seclusion rates (van der Merwe et al, 2012).

When comparing the pre-to-post intervention questionnaire the variation in response rates need to be considered. A significant higher response rate was evident post-intervention for all of the questions except the last two questions on the Likert scale which asked whether seclusion was necessary and punitive. Only a third of the clinical staff completed these questions. This further suggests that staff may have found it difficult to rate their thoughts to these two questions. The implications of a higher response rate may have altered the findings considerably.

When reviewing a questionnaire it is important to consider the validity and reliability of the questions. The validity of the Heyman's questionnaire is well reported with an adequate Cronbach's Alpha of .62 to .79 measuring its internal consistency. However, as the post-intervention questionnaire within this study was altered by management, the validity of the questionnaire needs attention, as the potential for the test-retest reliability of the questionnaire to become void seems evident. Test-retest reliability examines potential measurement error when the same test is administered so that observations can be compared (Lavrakas, 2008). It would

have been advantageous to have completed a split-half method test on the questionnaires prior to staff completion. A split-half method would have ascertained whether staff obtained similar results when completing half the questionnaire at two different times (Lavrakas, 2008). A split-half method would have supported the reliability of the Heyman's attitude towards seclusion questionnaire.

In summary, one of the aims of the six core strategies intervention was to ascertain whether staff's attitudes towards seclusion shifted. Despite the limitations outlined above, this evaluation suggests that polarized views are still eminent towards seclusion practices. Seclusion is not therapeutic but is sometimes necessary, and not all staff view it as punitive.

Sensory modulation

Sensory modulation was one of the core aspects of the six core strategies. Results showed that sensory modulation was effective, with service users reporting a positive effect from using these strategies. Distress levels significantly reduced for service users within the open and ICU ward and preferred sensory modalities were easily identified. Different results were evident between the two wards about the most effective length of time needed in the sensory room, with service users from the open ward reporting greater improvement in stress levels after having spent approximately half an hour in the sensory room, however service users from the ICU ward required an average of 56 minutes for the same level of improvement. This finding may reflect the different nature and complex needs of patients in the ICU compared to those in the open ward.

Whilst the efficacy of the use of sensory modulation within mental health inpatient settings has been well studied with findings supporting sensory modulation as an effective tool to manage behaviour and reduce distress (Champagne & Sayer, 2008; Sutton & Nichol, 2011), no research was found that reported on the most effective length of time service users need to remain in the sensory room for optimal outcome. A future research study examining the optimal time of sensory room use to reduce levels of distress may support planning around sensory room use, alleviating staffing and ward planning issues.

Further barriers to sensory room use were noted by the service users such as sensory tools not being available or broken, or particular items were just not available particularly in the ICU ward. However no insight to the staff's perception of sensory room use was noted as service users self-reported on their experience. I raise this point with the understanding that staff would be required to accompany service users at the onset of sensory room use particularly in the ICU ward. Lee et al. (2010) identified that staff's time constraint limits the opportunity for staff to therapeutically engage with service users on the ward. This may have limited staff's opportunity to encourage sensory room use and sensory modality engagement within the sensory room.

It could be argued that the service users' self-report of distress levels on the rating scales, and the duration of sensory room use is a limitation of this study. Self-rating scales can often show evidence of defensiveness and self-representational bias, in which service users may have rated themselves more favorably, which affects the validity of the findings. Furthermore, whilst self-rating scales clearly have the advantage of allowing individuals to convey exactly how they are feeling, the possibility of personality, psychopathology and possible cognitive impairment also needs consideration (Westen & Weinberger, 2004) especially in lieu of the time delay in which some service users recorded their data. It could also be argued that potentially additional service users may have used the sensory room yet not completed the paperwork. This would further support the limited dataset that was obtained over the two post-intervention years.

Sutton et al., (2013) pilot study examined the use of sensory modulation across five mental health settings. Their findings identified that sensory modulation provided service users with the opportunity to stabilize distress levels, and promoted transferable self-regulation techniques. Sensory modulation appears to reduce the need for seclusion and restraint practice, promotes recovery and works within a trauma-informed model of care.

PRN medication
PRN medication is often used to manage behaviour within an acute mental health inpatient setting, and often referred to as an alternative form of restraint (Donat, 2005). With the reduction in seclusion it is important to ensure that PRN medication use does not significantly increase. The

findings of this study showed that although the use of one of the medications was stopped for unknown reasons, overall most of the medications dispensed nearly doubled over the two years post-intervention. This suggests that with the reduction in seclusion and restraint, the amount of medication used increased. These results are not surprising. Gerlock (1983) found a significant difference in the use of medication between secluded and non-secluded patients. Service users who were known to be secluded had higher amounts of medication prescribed, and were administered more PRN medication than secluded patients (Tunde-Ayinmode, 2004). The increase in the use of PRN medication within this study could suggest that service users who were known to have been secluded could have received PRN medication at the early onset of distress, thus PRN medication was used as an alternative form of restraint.

It is important to note however that this increase in medication use may be due to other factors as well. Firstly as data was collated from retrospective pharmacology records on the amount dispensed rather than the number of service users the medication was administered to, one service user's prescription may be an outlier in the data and therefore skew the results suggesting that more service users were medicated than there really were. Secondly, any change in the clinical practitioner's prescription of medication may have influenced the amounts of medication actually dispensed. Lastly, as found in this study, the high rate of service user admission and discharges may have also influenced the result. It is not atypical for service users to have their medication altered or changed post admission to the inpatient ward. Furthermore, often medications are reviewed until the correct medication type and dose is found. These changes could be attributed to the high rates of PRN medication administered.

It is also important to consider staff's attitudes towards PRN medication as noted in their responses in the Heyman's (1987) staff attitudes questionnaire. Staff strongly viewed that service users would need less seclusion if staff had more control over their PRN use. This is an interesting point that needs further exploration as it contradicts the findings of Gerlock (1983) and Tunde-Ayinmode (2004), and may have also contributed to the concerns around the maintenance of the six core intervention strategy over the two years post-intervention.

Methodological considerations and limitations

Throughout this report the efficacy of the six core strategy intervention with sensory modulation has been evaluated, with potential confounds and bias identified. However, due to the retrospective nature of the data collection, this study is also limited by the extent of accuracy of the data obtained. This effects the validity and reliability of the study.

Downs and Black (1998) developed a critiquing tool that tests the methodological quality of nonrandomized cohort or case-studies, highlighting the strengths and weakness within the methodology, critiquing its validity and reliability. The Downs and Black (1998) critique tool has good internal consistency (KR-20: 0.89), test-retest reliability (r = 0.88), inter-rater reliability (r = 0.75), and criterion validity (r = 0.90). Applying the Downs and Black critiquing tool to the methodological quality of this study found a poor rate of 12 from 27 showing low validity and reliability. The reporting of the study was reasonable with clear objectives and outcome definitions described, however the external validity, the ability to generalize the finding of this study to other mental health units is limited, not only due to the small sample that has limited representation but also due to the variation in acute mental health inpatient settings.

A low level of internal validity or reliability was also determined. Due to the inability to blind both the staff and participants to the intervention, and considering the bias implicitly evident in staff collating the data, the evidence of bias in the data needs mention. Bias is created when measurements over-or-under-estimate results due to other factors (Lavrakas, 2008). In addition to those been mentioned the potential biases evident in the service users self-report ratings post sensory modulation, and the staff's Likert scale results also need consideration. Biases, like confounds can be responsible for a false significant result as the outcome may be due to the bias or confound rather than the intervention being measured. Examples of confounds within this study would be the changing nature of an acute inpatient mental health unit, staff turnover, service user admissions and discharge, psychopathologies, and levels of staff training. Confounds are like additional variables that could have an effect on the seclusion and restraint episodes, or the reasons that staff have a particular attitude toward seclusion (Bryman, 2008).

Lastly, due to small sample size, the study did not have sufficient power to determine a significant effect as the probability for the difference pre-to-post intervention was less than 5% possibly attributed to chance.

It is essential that high quality data is collected so that analytical understanding is obtained and good decisions can be made (Davidson & Tolich, 2003). Obtaining data from standardized measures increases the reliability and validity of the study, and provide confidence that post-intervention data is a true measurement of change (Victoria Quality Council, 2013). For this study to be valid, careful examination of the tools used to measure post-intervention data needs to be conducted to ensure that the actual process of change pre-to-post intervention is measured accurately. Furthermore, a good response rate is important to ensure that a representational sample is obtained, and the findings of the study are able to be generalized (Bryman, 2008).

Clinical implications and future research

Despite this studies limited reliability and validity, this study has illustrated that the six core strategy intervention with sensory modulation successfully reduced seclusion within the acute mental health inpatient unit, and sensory modulation was significantly effective in reducing service user's levels of distress. Staff's attitudes towards seclusion showed mixed results with the majority of staff agreeing that seclusion is not therapeutic, and nearly half of the staff perceiving that seclusion is necessary especially when staff's safety is at risk, and seclusion is punitive.

Although the results were limited by the retrospective nature of the data collection, some interesting findings have emerged that indicate that in spite of the reduction in seclusion and restraint rates, more education, support and management of staff may be required to ensure that these rates remain minimal. In addition, with more maintenance of the six core strategy intervention in the post-intervention years, a future prospective research would validate the efficacy of the intervention. A prospective controlled trial with standardized measures would provide empirical data of association between the six core strategies intervention with sensory modulation and the reduction of seclusion and restraint, removing bias and false causality.

While acknowledging that research within acute mental health inpatient units is challenging and requires an unique research design, further studies that explore a clear definition of seclusion and restraint practice is required so that a uniform way of reporting between studies is developed. Furthermore, an exploration of antecedent behaviours and the reasons for seclusion and restraint needs to be understood with a detailed account of all intervention methods tried prior to seclusion and restraint being enacted upon. This would highlight whether in fact an increase the amount of PRN medication was evident. Lastly, a closer examination of the gender and ethnicity disparities would show whether gender and ethnicity variables influence the efficacy of sensory modulation as a tool to reduce distress levels.

Conclusion

The need to reduce seclusion and restraint practices in acute mental inpatient settings has grown over the last decade, and is supported by the demand for mental health systems to provide trauma-informed care that promotes a recovery orientation (Huckshorn, 2004). The NASMHPD six core strategies intervention is a trauma-informed and recovery model of practice that reduces seclusion and restraint, and is being implemented in numerous psychiatric inpatient units around the globe with positive results (Delaney, 2006). In this present study, the six core strategy intervention with sensory modulation assisted staff to moderate challenging behaviour with the improved availability of sensory modulation resources. Individually identified and tailored resources supported service users to calm, and also provided staff with the opportunity to therapeutically engage with service users. As a result seclusion practices were nearly omitted and the trend in restraint data suggested a reduction in the use of restraint as well. This study has made a unique contribution to literature as it is the first New Zealand study to examine the efficacy of the six core strategies intervention with sensory modulation within an acute mental health unit for adults. This study could set precedent for the implementation of the six core strategies intervention in other New Zealand acute mental health units.

References

Achieving the Promise: Transforming Mental Health Care in America. Department of
      Health and Human Services. President's New Freedom Commission on Mental
      Health Care in America. (2003). Retrieved on April 16, 2013 from
      www.govinfo.library.unt.edu/.

Allen, J. J. (2000). Seclusion and restraint of children: a literature review. *Journal of
      Child and Adolescent Psychiatric Nur*sing, 13(4), 159-167.

Anthony, W. A. (1991). Recovery from mental illness. The new vision of services
      researchers. *Innovation and Research*, 1, 13-14.

Anthony, W. A. (1993). Recovery from mental illness. The guiding vision of the mental
      health service system in the 1990's. *Psychosocial rehabilitation skills*, 2(2), 171-
      187.

Azeem, M. W., Aujla, A., Rammerth, M., Binsfeld, G., & Jones, R. B. (2011).
      Effectiveness of six core strategies based on trauma informed care in reducing
      seclusions and restraints at a child and adolescent psychiatric hospital. *Journal of
      Child and Adolescent Psychiatric Nursing: Official Publication of the
      Association of Child and Adolescent Psychiatric Nurses, Inc*, 24(1), 11-15.
      doi:10.1111/j.1744-6171.2010.00262.

Beauchaine, T. (2001). Vagal tone, development, and Gray's motivational theory: toward
      an integrated model of autonomic nervous system functioning in psychopathology.
      Development and Psychopathology, 13(2), 183-214.

Barton, R. (1998). The rehabilitation-recovery paradigm: A statement of philosophy for a
      public mental health system. *Psychiatric rehabilitation skills,* 2(2), 171-187.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative
      research in Psychology* 3, 77-101.

Champagne, T. (2008). Sensory Modulation & Environment: Essential Elements of Occupation
      (3rd Ed.). Southampton, MA

Champagne, T. & Stromberg, N. (2004). Inpatients psychiatric settings. Innovative
      alternative to seclusion and restraint. *Journal of Psychosocial Nursing*, 42 (9), 1-
      8.

Cohen, J. (1988). Power tables for effect size d. Retrieved on October 15, 2013 from
      www.psych.unl.edu/hoffman/Sheets/Workshops/Power_Tables.pdf

Delaney, K. R. (2006). Evidence Base for Practice: Reduction of Restraint and Seclusion
      Use during Child and Adolescent Psychiatric Inpatient Treatment. *Worldviews on
      Evidence-Based Nursing,* 3(1), 19-30. doi:10.1111/j.1741-6787.2006.00043.x

Donat, D., C. (2005). Encouraging alternative to seclusion, restraint, and reliance on
      PRN drugs in a public psychiatric hospital. *Psychiatric Services*, 56(9), 1105-
      1108.

Gaskin, C. J., Elsom, S. J., & Happell, B. (2007). Interventions for reducing the use of
      seclusion in psychiatric facilities: Review of the literature. *British Journal of
      Psychiatry*, 191, 298-303.

Grigson, J. W. (1984) Beyond Patient Management: The Therapeutic Use of Seclusion
      and Restraints. *Perspectives in Psychiatric Care*, 22 (4), pp. 137-142.

Hammer, J. H., Springer, J., Beck, N. C., Menditto, A., & Coleman, J. (2011). The

relationship between seclusion and restraint use and childhood abuse among psychiatric inpatients. *Journal of Interpersonal Violence*, 26(3), 567-579. doi:10.1177/0886260510363419.

Harris, J., Allen, D., Cornick, M., Jefferson, A. and Mills, R. (1996). Physical interventions: A Policy Framework. *British Institute of Learning Disabilities*. Retrieved on 6 August, 2013, from www.bild.org.uk.

Huckshorn, K. A. (2004). Reducing Seclusion & Restraint Use in Mental Health Settings: Core Strategies for Prevention. *Journal of Psychosocial Nursing & Mental Health Services*, 42(9), 22.

Huckshorn, K. A. (2005). Six core strategies to reduce the use of seclusion and restraint planning tool. National Technical Assistance Center. Retrieved on May 13, 2013, from www.hogg.utexas.edu/uploads/documents/SR_Plan_Template.pdf.

Huckshorn, K., A. (n.d.). Six core strategies for reducing seclusion and restraint use. Draft example: Policy and procedure on debriefing for seclusion and restraint reduction projects. National Technical Assistance Centre. Retrieved on July 30, 2013 from   www.hogg.utexas.edu/uploads/documents/six_core_strat_debriefing.pdf.

Janssen, W., Noorthoorn, E., Linge, R., & Lendmeijer, B. (2007). The influence of staffing levels on the use of seclusion. *International Journal of Law Psychiatry*, 30 (2), 118-126.

Johnson, M.E. (2010). Violence and restraint reduction efforts on inpatient psychiatric units. *Issues in Mental Health Nu*rsing, 31, 181-197.

Kinnealey, M., & Fuiek, M. (1999). The relationship between sensory defensiveness, anxiety, depression and perception of pain in adults. *Occupational Therapy International*, 6(3), 195-206.

Kinnealey, M., Oliver, B., & Wilbarger, P. (1995). A phenomenological study of sensory defensiveness in adults. *The American Journal of Occupational Therapy,* 49(5), 444.

Kezelman, C. & Stavropoulos, P. (2012). Practice Guidelines for Treatment of Complex Trauma and Trauma Informed Care and Service Delivery. Retrieved on November 13, 2013, from www.asca.org.au.

Lancaster, G. A., Whittington, R., Lane, S., Riley, D., Meehan, C.)2008). Does the position of restraint of disturbed psychiatric paitents have any association with staff and patient injuries? *Journal of Psychiatric and Mental Health Nursing*, 15(4), 306-312.

Lavrakas, P., J. (2008). Encyclopedia of survey research methods. Retrieved August 20, 2013, from www.dx.doi.org/10.4135/9781412963947.

Markowitz, F. E., DeMasi, M. E., Carpinello, S. E., Knight, E. L., & Videka-Sherman, L. (1996). *The role of self-help in the recovery process*. Alexandria, VA: Proceedings: 6th Annual National Conference on State Mental Health Agency Services Research and Program Evaluation. National Association of State Mental Health Program Directors (NASMHPD) Research Institute.

Meehan, T., Bergen, H., & Fjeldsoe, K. (2004). Staff and patient perceptions of seclusion: has anything changed? *Journal of Advanced Nursing*, 47(1), 33-38.

Mental health crisis care: physical restraint in crisis. *A report on physical restraint in hospital settings in England*. (2013, June). Retrieved September 18, 2013, from www. mind.org.uk.

Ministry of Health (2010). *Seclusion under the Mental Health (Compulsory Assessment and Treatment) Act, 1992*. Wellington: Ministry of Health.

Morrison, P. & Le Roux, B. (1987). The practice of seclusion. *Nursing Times Occassional Paper*, 83 (19), 56-66.

Novak, T., Scanlan, J., McCaul, D., Macdonald, N., & Clarke, T. (2012). Pilot study of a sensory room in an acute inpatient psychiatric unit. *Australasian Psychiatristy*, 20 (5), 401-406.

Olofsson, B., & Norberg, A. (2001). Experiences of coercion in psychiatric care as narrated by patients, nurses and physicians. *Journal of Advanced nursing* 33(1), 88-97.

Pfeiffer, B., & Kinnealey, M. (2003). Treatment of sensory defensiveness in adults. *Occupational therapy international*, 10(3), 175-184. doi:10.1002/oti.184.

Scanlan, J.N. (2010). Interventions to reduce the use of seclusion and restraint in inpatient psychiatric sett*ings:* What we know so far a review of the literature. *International Journal of Social Psychiatry*, 56, 412-423.

Soloff, P. H. (1979) Physical Restraint and the Non-Psychotic Patient: Clinical and Legal Perspectives. *Journal of Clinical Psychiatry*, 40 (7), 302-305.

Smith, R., C. & Bartholomew, T. (2006). Will hospitals recover? The implications of the recovery-orientation. *Journal of Psychiatric Reh*abilitation, 9, 85-100.

Stowers C, Crane C, Fahy M. (2002). How patients and staff view the use of seclusion. *Nursing Times* 98 (42), 38-39.

Sutton, D., Wilson, M., Van Kessel, K., & Vanderpyl, J. (2013). Optimizing arousal to manage aggression: A pilot study of sensory modulation. *International Journal of Mental Health Nursing,* 22(6), 500-511.

Smith, G., Davis, R., Bixler, E., Lin, H., Altenor, A., Altenor, R., Hardentine, B., Kopchick, G. (2005). Pennsylvania state hospital system's seclusion and restraint reduction program. *Psychiatric Services Journal*, 56 (9), 1115-1122.

Tyrer, S., Beckley, J., Goel, D., Dennis, B., & Martin, B. (2012). Factors affecting the practice of seclusion in an acute mental health service in Southland, New Zealand. *The psychiatrist.*

van der Merwe, M, Bowers, L., Jones, J., Muir-Cochrane, E, & Tziggili, M. (2009). Seclusion: a literature review. *Report from the Conflict and Containment Reduction Research Programme, 3*6 (6), 214-218.

Westen, D. & Weinberger, J. (2004). When clinical description becomes statistical prediction. *American Psychologist*, 59, 595-613.

Wynaden, D., Orb, A., McGowan, S., Castle, D., Zeeman, Z., Headford, C., & Finn, M. (2001). The use of seclusion in the year 2000: What has changed? *Journal of the Royal College of Nursing Austral*ia, 8(3), 19-25.

Wynn, R. (2003). Staff's attitudes to the use of restraint and seclusion in a Norwegian university psychiatric hospital. *Nordic Journal of Psychiatry*, 57(6), 453-459.