The impact of sensory modulation in acute mental health units: an organisational case study analysis

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Abstract

Purpose – *Sensory modulation intervention involves using calming and grounding sensory stimuli to support coping with distress and intense emotions. Evaluating the impact of sensory modulation is challenging in inpatient settings due to the numerous variables influencing outcomes in ward environments. This study aims to determine the impact of sensory modulation across all organisational levels including service users, staff confidence and attitudes, ward climate and seclusion events.*

Design/methodology/approach – *Organisational case studies were conducted in two Aotearoa New Zealand inpatient mental health services, using qualitative and quantitative data to explore the effects of a sensory modulation programme.*

Findings – *Results showed that sensory modulation enhanced staff knowledge and confidence in fostering therapeutic relationships and reducing restrictive practices, positively impacted ward climate and provided service users with sensory strategies to use in everyday life.*

Practical implications – *The findings captured the complexity of implementation and impact of sensory modulation programmes at individual, group and organisational levels. It is important to recognise the influencing factors and impact of sensory modulation across all levels of service delivery.*

Originality/value – *Organisational case study methodology offered a unique approach to evaluating the impact of sensory modulation within inpatient mental health services. Data analysis suggests that in addition to managing acute service user distress, sensory modulation impacts broader staff, team and service level outcomes.*

Keywords *Inpatient unit, Acute mental health, Programme evaluation, Least restrictive practice, Mixed method, Seclusion*

Paper type *Research paper*

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Introduction

Sensory modulation (SM) is a therapeutic approach used to assist people manage their experience of sensory input, which in turn facilitates self-soothing and distress management in the event of crises, as well as supporting a calm and alert state outside of crisis situations (Sutton *et al.*, 2013). SM is particularly relevant for people with acute mental health problems who experience intense emotions and unpredictable physical sensations. A further aim is to enhance well-being and daily functioning of those receiving mental health care by offering sensory strategies tailored to individual needs, for example, reducing anxiety and distress by using weighted blanket (Champagne *et al.*, 2015) and spending time in the sensory (comfort) room (Cummings *et al.*, 2010). This personalised approach supports service users in reducing arousal levels (Gardner, 2016; Dorn *et al.*, 2020), elicits positive physiological effects (Reddon *et al.*, 2004) and offers a safe calming environment (Wiglesworth and Farnworth, 2016). Overall, SM supports service users to develop self-regulation skills and coping strategies and has been associated with improved quality of life (Forsyth and Trevarrow, 2018; Barbic *et al.*, 2019; Lindberg *et al.*, 2019).

Received 7 February 2024
Revised 21 May 2024
Accepted 30 May 2024

Data availability statement: The complete set of data that support the findings of this study are available from the corresponding author, G.A., upon reasonable request.

Chalmers *et al.* (2012) and Knight *et al.* (2010) compared traditional and sensory-based interventions within inpatient units, while Novak *et al.* (2012) hypothesised that SM would reduce distress and disruptive behaviours. These studies found reductions in various symptoms, including anxiety, excitement, tension, uncooperativeness, hostility and depression. SM has been shown to improve interpersonal relationships and communication between staff and service users (Smith and Jones, 2014; Sutton and Nicholson, 2011). Two randomised controlled trials offer strong evidence for the therapeutic potential of SM in mental health inpatient units (Bensimon *et al.*, 2018; Cheng *et al.*, 2017). Bensimon *et al.* (2018) found that music therapy in seclusion rooms can help reduce psychomotor agitation and promote a sense of calm. Meanwhile, Cheng *et al.* (2017) found that sensory rooms alleviated anxiety and mitigated negative symptoms associated with schizophrenia. SM provides service users with choices and opportunities for self-management, facilitating user autonomy (Wright *et al.*, 2020). However, more research is needed to build a more comprehensive evidence base, particularly regarding the impact of SM on seclusion and restraint rates.

Several researchers have examined the effects of SM on service users symptoms, behaviour and seclusion rates within acute inpatient mental health settings. SM appears to have a positive effect on service users symptoms and behaviour. For example, positive effects of weighted blankets in service user symptoms and behaviour have been reported (Novak *et al.*, 2012), alongside findings that music promoted their relaxation (Knight *et al.*, 2010), particularly if based on their own selections (Smith and Jones, 2014).

Research on the effects of SM on seclusions and restraint have shown significant reduction in seclusion rates (Lee *et al.*, 2010; Lloyd *et al.*, 2014), restraint rates (Champagne and Sayer, 2003) and belt restraints and forced medication (Andersen *et al.*, 2017). These studies have been largely retrospective.

The limited literature on SM effectiveness calls for robust study designs to capture the complexity of the context and the relative impact of SM approach. In-depth prospective studies exploring factors affecting impact are crucial, especially since experimental designs face challenges due to numerous influencing variables. Previous studies (Sutton and Nicholson, 2011; Machingura and Lloyd, 2017) lack systematic and controlled evaluation of the efficacy of SM in a range of settings. There are also significant gaps in understanding the broader organisational impact of SM within acute mental health settings.

The current study was a comprehensive organisational investigation to explore the impact of SM on several facets of the organisation, including service users mental health outcomes, staff confidence, staff attitudes and seclusion events. The implementation of the SM programme comprised of five components: training, identification of key practitioners ("champions"), establishing clinical practice connections, provision of assessment forms and tools and recommendations for environmental adjustments (Azuela and Robertson, 2016; Champagne, 2008; Sutton and Nicholson, 2011). The evaluation of the impact of this SM programme was woven throughout the implementation process. Ethics approval was secured from Auckland University of Technology Ethics Committee (AUTEC) [1561] and the New Zealand Health & Disability Ethics Committee (HDEC) [15/STH/84].

Study design

This research used organisational case study design to evaluate the impact of an SM programme in two acute adult inpatient mental health services in New Zealand. Yin's (2014) exploratory case study approach was used to guide the research process. The study phases are illustrated in Table 1. Two organisations were intentionally selected based on their previous limited or unsuccessful SM implementation, high seclusion and restraint usage compared to the national average, and commitment to implementing the new SM programme. Staff and service users were invited to participate through surveys, focus

Table 1 Overview of the research phases and participants

Study phases	*Types of data collected*	*Inpatient unit A*	*Inpatient unit B*
1. Baseline: One-month period of capturing initial baseline data from the mental health units to establish the case contexts.	*Interviews*		
	■ Staff views on existing distress management and de-escalation practices (senior OT, clinical nurse specialist)	$n = 1$	$n = 1$
	■ Middle management views on existing distress management and de-escalation practices (team leader, clinical nurse specialist)	$n = 1$	$n = 1$
	Review of organisational documents		
	■ Organisational policy related to de-escalation and seclusion/restraint use	✓	✓
	■ Clinical files	$n = 6$	$n = 6$
	Environmental scanning		
	■ Available sensory tools and modalities	✓	✓
	■ Location and size of sensory room	✓	✓
	■ Wall colours of the inpatient units	✓	✓
	■ Building layout of the inpatient units	✓	✓
	■ Natural lighting of the inpatient units	✓	✓
	Surveys		
	■ Ward climate (Schalast *et al.*, 2008)	$n = 19$	$n = 18$
	■ Staff confidence in managing challenging behaviour (Martin and Daffern, 2006)	$n = 19$	$n = 18$
	■ Staff attitude towards the use of seclusion (Van Doeselaar *et al.*, 2008)	$n = 19$	$n = 18$
	■ Sensory modulation knowledge (Azuela and Robertson, 2016)	$n = 21$	$n = 29$
2. Implementation:	Six-month period of implementing the sensory modulation programme within the units	✓	✓
3. Evaluation: Three-month period of evaluating the sensory modulation programme implementation.	*Interviews*		
	■ Focus groups with staff views on sensory modulation impact (allied health staff, occupational therapist, support worker, nurse, social worker)	$n = 8$	$n = 8$
	■ Service user focus group on sensory modulation impact	$n = 7$	$n = 3$
	■ Interview with Middle management on sensory modulation impact	$n = 2$	$n = 2$
	Review of organisational documents		
	■ Organisational policy related to de-escalation and seclusion/restraint use	✓	✓
	■ Clinical files	$n = 6$	$n = 6$
	Environmental scanning		
	■ Available sensory tools and modalities	✓	✓
	■ Location and size of sensory room	✓	✓
	■ Wall colours of the inpatient units	✓	✓
	■ Building layout of the inpatient units	✓	✓
	■ Natural lighting of the inpatient units	✓	✓
	Surveys		
	■ Ward climate (Schalast *et al.*, 2008)	$n = 19$	$n = 18$
	■ Staff confidence in managing challenging behaviour (Martin and Daffern, 2006)	$n = 19$	$n = 18$
	■ Staff attitude towards the use of seclusion (Van Doeselaar *et al.*, 2008)	$n = 19$	$n = 18$
	■ Upper management views on sensory modulation impact	$n = 5$	$n = 5$
	■ Staff views on sensory modulation impact (nurse, occupational therapist, psychologist, social worker, support worker)	$n = 19$	$n = 18$

Source: Table by authors

groups and interviews and those that chose to participate gave written informed consent. All staff and service users could access the SM room and tools whether they chose not to participate in the study or not.

Data collection

As presented in Table 1, quantitative and qualitative data were collected to capture a range of potential SM impacts.

Data analysis

Data were analysed consistent with organisational case study design, which involved synthesis of the case study information and underscored similarities and differences within and between the two inpatient services. The focus was on illustrating "patterns of findings" across the inpatient units (Yin, 2014, p. 143). Quantitative data analysis was used to assess the SM programme's impact on ward climate, staff confidence in managing challenging behaviour and staff attitudes towards seclusion. IBM SPSS® Statistics (2015) was used to generate tables displaying frequencies, percentages, medians and cross-tabulation analysis of essential variables. Qualitative data from focus groups, individual interviews and organisational documents were analysed using NVivo (v10) software and thematic analysis (Nowell *et al.*, 2017) to identify meaningful themes and concepts.

Findings

The impact of the SM programme at the various organisational levels within the units is presented in Table 2 which includes quantitative data.

Impact on the organisation

The primary impact measured at an organisational level pertains to the rates of seclusion events one year before and six months after the implementation of the SM programme. In Unit A, there was a significant reduction in seclusion hours; however, the change in seclusion events was not statistically significant. For Unit B, there was a statistically significant change in the total number of seclusion events ($z = -2.06$, $p = 0.04$), the seclusion rates of females ($z = -2.23$, $p = 0.03$) and Pacific service users ($z = -2.56$, $p = 0.01$), as well as the sum of seclusion hours ($z = -2.28$, $p = 0.02$). These findings indicate a mixed impact on critical incident rates and the use of restrictive practices at an organisational level.

Impact on individual staff and team culture

Thematic analysis of the qualitative data identified three themes: staff knowledge and confidence; improved therapeutic relationships; and influence on ward climate. These themes alongside the quantitative data provided insights into the impact of sensory modulation on staff and team culture.

Staff knowledge and confidence. Before participating in SM training, self-ratings of SM knowledge in Unit A staff varied from 1 to 3.5, with a median score of 3 (SD = 0.88), and in Unit B, SM knowledge levels ranged from 1 to 4.5, with a median score of 3 (SD = 1.10). These results suggest that staff members in both units had a foundational understanding of SM. After the implementation of SM, staff confidence in the unit environmental safety in Unit A demonstrated a significant increase ($z = -2.11$, $p = 0.04$) and overall confidence ($z = -1.89$, $p = 0.05$) as shown in Table 2. In contrast, Unit B showed no significant change. However, a nurse from Unit B did report that staff felt more confident following the SM programme in offering clients the option of SM, even if their knowledge of using the

Table 2 Comparison of statistically significant results of the two inpatient units

Description and timeline		*Pre-SM programme implementation*	*Median*	*SD*	*Range*	*Inpatient Unit A Post-SM programme implementation*	*Median*	*SD*	*Range*	*z-value*	p-*value*[a]
			September 2014–August 2015				September 2015–August 2016				
Seclusion variables	*Total number of seclusion events*	91	8.50	3.85	1–12	81	6.5	3.41	1–12	−0.59	0.55
	Female	33	5.50	3.07	1–9	24	4.00	2.73	0–10	−0.45	0.64
	Pacific people	10	0.44	1.40	0–4	7	0.58	2.02	0–7	−0.67	0.50
	Sum of seclusion hours	2,038.50	126.80	133.97	52.40–521.30	999.70	68.75	77.51	2.10–284.50	−1.57	0.12
			Baseline (January 2016): one month before programme implementation				*Evaluation (August–October 2016): three-month period after the six-month period of implementing the sensory modulation programme within the units*				
Ward climate dimension	*Therapeutic hold*	–	3.33	0.83	2–5	–	3.29	0.65	2–4	−0.54	0.59
Staff knowledge	*Overall sensory modulation competency*	–	3	0.88	1.5–5	–	–	–	–	–	–
Staff confidence components	*How safe is the environment at your unit?*	–	3.06	0.62	1–4	–	3.42	0.51	3–4	−2.11	*0.04*
	Overall confidence	–	2.80	0.81	1–4	–	3.17	0.50	2–4	−1.89	*0.05*
Staff attitude Sub-scales	*More care*	–	2.50	0.77	1–4	–	3.13	0.74	2–4	−2.39	*0.02*
	Better care	–	3.00	0.94	1–4	–	3.50	0.77	2–4	−2.14	*0.03*

Notes: [a]*p*-value ∠ 0.05 significant result
Source: Table by authors

(*continued*)

Table 2

Description and timeline		*Pre-SM programme implementation*	*Median*	*SD*	*Range*	*Inpatient Unit B Post-SM programme implementation*	*Median*	*SD*	*Range*	*z-value*	p-*value*[a]
		September 2014–August 2015					September 2015–August 2016				
Seclusion variables	*Total number of seclusion events*	162	14.5	3.55	5–18	115	7.5	6.22	5–21	−2.06	*0.04*
	Female	118	4	2.19	0–7	80	2.5	2.50	0–7	−2.23	*0.03*
	Pacific people	9	0	1.36	0–4	8	0	0.98	0–3	−2.56	*0.01*
	Sum of seclusion hours	4,582.80	360.30	220.12	156.60–859.50	2649.90	145.30	196.84	19.70–550.70	−2.28	*0.02*
		Baseline (January 2016): one month before programme implementation					*Evaluation (August–October 2016): three-month period after the six-month period of implementing the sensory modulation programme within the units*				
Ward climate dimension	*Therapeutic hold*	–	3.41	0.61	2–4	–	3.73	0.73	3–5	−2.33	*0.02*
Staff knowledge	*Overall sensory modulation competency*	–	3	1.10	1–4.5	–	–	–	–	–	–
Staff confidence components	*How safe is the environment at your unit?*	–	2.29	0.83	1–4	–	2.59	0.61	2–4	−1.35	0.18
	Overall confidence	–	2.59	0.61	2–4	–	2.88	0.58	2–4	−1.31	0.19
Staff attitude Sub-scales	*More care*	–	2.59	0.61	2–4	–	3.00	0.80	1–4	−1.46	0.15
	Better care	–	3.00	0.77	2–4	–	3.21	0.79	2–4	−0.71	0.48

strategies had not changed significantly. This had a flow on benefit of clients becoming more aware of the benefits of SM and were increasingly using the sensory room as a therapeutic option:

> I feel that staff are more confident to give our clients the option of sensory modulation if the sensory room is available. And clients are more aware of it, and they've found that it is therapeutic for them at the same time, so they're using it more and approaching nurses to take them there. (UB3)

These findings suggest that staff confidence in managing challenging behaviour among service users improved following SM training for a proportion of the staff. Increased confidence among staff in managing service users' distress and challenging behaviours correlated with an enhancement of their knowledge in SM.

Improved therapeutic relationships. Staff attitudes towards the use of seclusion in Unit A showed significant changes in the subscales of "more care" ($z = -2.39$, $p = 0.02$) and "better care" ($z = -2.14$, $p = 0.03$) as shown in Table 2. The increased ratings in these items indicated that relationships between staff and service users had improved post-implementation of SM. In contrast, Unit B showed no statistically significant change. However, a nurse from Unit B noted that SM training led to a greater acceptance of this approach as part of their job, and they felt supported in implementing it. At the same time the number of restraints significantly decreased, and seclusion rates also dropped, reflecting the reported change in attitude among staff. Qualitative data indicated that the introduction of new staff members further reinforced this positive shift:

> There's much more of an acceptance that this is part of our job, and I feel supported to do that, and I think the knock-on effect from that has come from the SM training, and consequently our restraints have literally dived through the floor. Now that we've got a new room or it's been remodelled, our seclusions have dived through the floor as well, because of that. . .not just the demographic, the design of it, it's the change, isn't it? It's the change in attitude. There's a couple of new staff come in, and it's just great. (UB4)

Impact on overall ward climate. No significant change was evident in the measure of ward climate in Unit A. However, ward climate in Unit B showed a significant change in the dimension of "therapeutic hold" ($z = -2.33$, $p = 0.02$), suggesting an improvement in relationship between staff and service users. Interviews with staff from both units revealed a noticeable shift in unit climate, with SM practices integrated into their daily routines. This may signify increased staff confidence in handling aggressive behaviour among service users and a transformation in staff attitudes towards seclusion.

One support staff member noted a considerable change in Unit A's culture due to the introduction of SM and the associated changes in the physical and social environment:

> There's been a massive change. Even the culture's shifted with the different environment, and that was very palpable. I can say that because I worked in the unit before. (UA2)

According to one nurse, the open side of Unit B became quieter since clients tend to visit the sensory room first, which helps clients to feel calmer. The change in ward climate has also allowed staff to feel relaxed as they no longer needed to manage multiple elevated clients simultaneously:

> I think it's quieter on the open side than what it used to be, and that's because people are going to the sensory room first, so it's bringing them down, whereas before it can be quite full-on, could be quite manic. Staff would be running around like ****** because they might have 5, 6, 7 clients that are all elevated. Definitely helped with staff as well, staff are a lot more relaxed. (UB1)

Overall, there were inconsistent findings across both quantitative and qualitative data. The SM programme improved individual staff perceptions and confidence in managing service

users' distress and attitudes toward coercive practices but did not necessarily impact the broader ward climate and team culture at an organisational level.

Impact on service users

Thematic analysis from the content of service users' clinical files, interviews and focus groups found that sensory modulation reduced distress, increased calm, provided a greater sense of control in stress management and taught them strategies to use in life.

Reduced distress and increased calm. The impact of the SM programme on service users is primarily reflected in therapeutic outcomes given SM provides an alternative option to deal with their distress, agitation or intense emotions. The SM programme included service users identifying specific SM tools as preferred options over pharmaceutical intervention [*pro re nata* (PRN)] and coercion.

A service user from Unit B discussed the benefits of the sensory room as an alternative to PRN medication, mentioning the comfortable seats, weighted blanket, weighted dog, aromatherapy and the availability of sweets:

> For me, the sensory room, I need an alternative to just taking PRN all the time. You use comfortable seats, a weighted blanket, a weighted dog, and aromatherapy. There is a good stash of sweets in there, too, which was also good. (UB1)

A service user from Unit A shared their experience with a weighted blanket, which evoked comforting childhood memories:

> The first time I ever had a weighted blanket on me, I was just transported, like to immediately back to being tucked in, yeah, kicked in those memories straight away, like I could smell my dad and I could like to smell the bed, I could like to see my childhood bedroom. (UA2)

Greater sense of control in managing distress. SM provided service users with a greater sense of control in managing their distress. Service users described having a number of preferred places for using SM tools including their room at home, their allocated hospital room, a bathroom or the kitchen area. This gave them flexibility to self-soothe whenever or wherever they needed to.

The importance of recognising the right moment to use sensory strategies was identified by a service user from Unit A, as the strategy might only be effective if the individual is not too overwhelmed. In such cases, medication might also be less effective:

> You have got to catch yourself at a certain level. If you go past that, I think it is, like anything, it is next to useless. Medication can be useless, too, if you get past that point. You have got to wait for yourself to come back down again for something to be effective. (UA3)

According to a service user from Unit B, SM offered greater freedom than medication which can only be used at certain time intervals:

> Well, you can only use them [medications] like 4 hours in between, so sensory you have total freedom with, aye. You can use whenever, yeah. (UB2)

Strategies to use in life. Service users reported being able to use SM strategies in other parts of their lives. For example, one service user (Unit A) mentioned using earmuffs constantly outdoors to reduce sensory input, as they are susceptible to sound:

> I have these earmuffs which I kind of just wear a sort of constantly if I am out and about, just to reduce the input level because I am very sensitive. (UA4)

Service users from Unit B appreciated using the sensory room as the first option before PRN medication, providing a more natural way of dealing with their emotions and needs.

After spending time in the sensory room or having a hot bath with Epsom salts, they often felt better without needing additional medication:

> It was good, too, especially like making the sensory room the first option before PRN [. . .] You go to the sensory room, and you might spend 20, 25 minutes, and you come in, [. . .] I do not need that medication now. It is like having a hot bath with Epsom salts [. . .] you just felt so much better. It is more the natural way of dealing with it instead of that [PRN]. (UB2)

Discussion

This organisational case study provided a unique approach to evaluating the impact of an SM programme on acute inpatient mental health service. The study has illustrated an overall positive effect of SM on the organisation, staff and the service users.

Organisational level

New Zealand has made significant progress in reducing seclusion since 2009 by implementing the Six Core Strategies® (Te Pou, 2020), which could have affected the observed seclusion rates of the two inpatient mental health unit. Findings on the impact of SM on seclusion rates across both units were inconsistent with results from one unit noting a reduction in seclusion rates while no change was found in the other unit Professional differences between the two units existed where the nursing-led SM programme implementation in one unit focused more on de-escalation and seclusion reduction, while the other unit's occupational therapy-led SM programme emphasised skills development in distress management. The implementation led by nursing may have resulted in a more significant decrease in seclusion due to the crisis response in supporting service users in managing distress. While a causal relationship between implementation of the SM programme and reduced seclusion use cannot be confirmed, there was a possible relationship or correlation between the type of leadership, the focus of the implementation and possible impact on staff practice and use of seclusion. This could become a proposition for further case study research.

The inconsistent findings of this study on the effects of SM on seclusion differ from other studies that have reported reduced seclusion rates in mental health facilities after implementing SM strategies (Barton *et al.*, 2009; Champagne and Stromberg, 2004; Lee *et al.*, 2010; Lloyd *et al.*, 2014; Maguire *et al.*, 2012; Sivak, 2012). The lack of significant reduction in seclusion in one unit may be related to the emphasis on developing service users' skill in distress management rather than on de-escalation and seclusion reduction, which featured strongly in other studies. This finding necessitates further investigation using prospective or experimental study designs.

SM techniques can create a more supportive environment for service users, promoting self-regulation and fostering better-coping strategies (Forsyth and Trevarrow, 2018; Barbic *et al.*, 2019; Lindberg *et al.*, 2019). This can lead to a decrease in reliance on seclusion as a means of managing disruptive behaviour, aligning with the priorities of New Zealand mental health services, and positively impacting the organisation as a whole. Organisations can reduce reliance on seclusion and restraint by promoting a more positive and humane approach to mental health care, and equipping staff with the tools and expertise to manage challenging behaviours through SM. SM techniques significantly impact individual staff members by enhancing their knowledge and skills related to de-escalation methods. This technique increases confidence and competence in supporting distressed service users without coercion, leading to a more effective and compassionate mental health care environment (Azuela and Robertson, 2016; Meredith *et al.*, 2016; Azuela, 2019).

Staff team and individual level

Enhancing staff knowledge and skills is essential to the success of SM programme implementation overall, as well as impacting individual staff members. Developing skills and knowledge can enable mental health professionals to provide more compassionate, trauma-informed care, fostering a therapeutic environment that prioritises the well-being and autonomy of service users (Azuela and Robertson, 2016; Meredith *et al.*, 2016; Azuela, 2019).

The implementation of SM in the current study positively influenced individual staff members' perceptions and confidence in managing service users' distress and attitudes towards coercive practices; however, it did not necessarily significantly impact the broader ward climate and organisational team culture. This could be attributed to the extended period needed to effectively alter an organisation's culture (Glisson *et al.*, 2008). Changing an organisation's culture is a complex and gradual process that redefines the workforce's values, beliefs and practices (Schalast *et al.*, 2008). It requires a consistent and concerted effort from all levels of the organisation to foster a more supportive, inclusive and efficient working environment (Nicholls *et al.*, 2015). As such, it is essential to recognise that the desired transformations in ward climate (Schalast *et al.*, 2008), staff confidence (Martin and Daffern, 2006) and attitudes (Van Doeselaar *et al.*, 2008) may take time to become apparent and may emerge gradually as the organisational culture adapts to new approaches and methodologies. Patience and persistence in implementing and reinforcing positive changes are vital to achieving long-term success in improving an organisation's culture.

The present study supports existing research findings (Björkdahl *et al.*, 2016; Te Pou o te Whakaaro Nui, 2017), which demonstrate the positive impact of SM on staff confidence when handling challenging behaviours exhibited by service users. By understanding and addressing the sensory needs of service users, staff can effectively de-escalate challenging situations, leading to improved communication, reduced stress and a safer environment for all involved (Dickens *et al.*, 2022). As individual staff become proficient in SM techniques, their confidence and competence in managing service users' challenging behaviours increase, ultimately promoting a more positive and efficient working atmosphere (Azuela and Robertson, 2016; Meredith *et al.*, 2016).

Service user level

The impact of SM on service users in the current study was evident in service users reports of improved communication and reduced stress levels and their experience of being in a safer inpatient mental health environment. Service users also described having alternative tools to manage distress as a result of the SM programme. These findings are consistent with the aim of SM to provide service users with the tools necessary to self-regulate sensory needs and manage their behaviour effectively (Haig and Hallett, 2023). The impact of SM was also evident in reduced stress levels and increased satisfaction reported by service users. Interestingly, the current study also identified generalisation of SM use by service users beyond the designated rooms within the units, extending to other spaces such as service user's room, and outdoor garden. This is a unique outcome not previously reported in the SM literature and suggests a promising integration of learning into other contexts, a skill which has been found important in service users recovery in relation to other skills training (Haig and Hallett, 2023).

The reported service users' experience of SM echo previous research showing that sensory rooms effectively reduce distress and improve behaviour management for service users (Bensimon *et al.*, 2018; Cameron *et al.*, 2020; Cheng *et al.*, 2017; Craswell *et al.*, 2020; Te Pou o te Whakaaro Nui, 2017). Results also align with Sutton and Nicholson's (2011) work on integrating SM tools into treatment plans. Engaging service users in meaningful activities

is crucial for mental health recovery (Champagne, 2008), and accessible activity programmes are essential for inpatient service users (Colton, 2004).

Limitations

The case study design provided rich data and associations between contextual factors and allowed for the SM intervention and outcomes to be explored, yet direct cause and effect relationships cannot be identified through this study design. Although the findings showed some reduction in seclusion rates in one of the units, other organisational factors and strategies may have influenced this outcome. Future studies could use prospective experimental designs to track seclusion over time, including individual seclusion and restraint rates and admission and discharge dates.

Implications

The current study provided a unique approach to evaluating the impact of sensory modulation on an inpatient mental health service. Future studies could assess the utility and impact of SM in relation to seclusion and restraint reduction by capturing information from debriefings following clinical incidents or seclusion and restraint events. This could provide a rich source of data describing what was helpful and less helpful in terms of SM strategies, during and after clinical incidents. In addition, the use of sensory strategies for home-based crisis and acute care could be explored and evaluated by capturing a broader range of potential impacts including rates of PRN use and whether sensory strategies are integrated into homebased safety or crisis plans.

Conclusion

The present organisational case study identified the impact of an SM programme on organisations, staff, and service users in two mental health facilities. Findings suggested the approach had an overall positive impact with service users and staff of both units reporting that SM contributed to the reduction and management of service users' distress and agitation and was preferred by service users over coercive and pharmaceutical methods. There was potential improvement in service users and staff relationships (therapeutic hold), alternative management of service users distress, and increased knowledge and skills of staff related to SM, with a possible influence on seclusion reduction. Despite the apparent lack of significant change to team culture, individual staff reported increased confidence in managing service users' challenging behaviour using the sensory strategies, supporting the notion that SM can have a positive impact for staff as well as service users. Future researchers may encounter challenges when using organisational case study design on a larger scale, such as data management and programme implementation in a complex dynamic environment like acute inpatient mental health service.

References

Andersen, C., Kolmos, A., Andersen, K., Sippel, V. and Stenager, E. (2017), "Applying sensory modulation to mental health inpatient care to reduce seclusion and restraint: a case control study", *Nordic Journal of Psychiatry*, Vol. 71 No. 7, pp. 525-528, doi: 10.1080/08039488.2017.1346142.

Azuela, G. (2019), "Sensory modulation: application in practice", *Participant Learning Manual*, Te Pou, Auckland.

Azuela, G. and Robertson, L. (2016), "The effectiveness of a sensory modulation workshop on health professional learning", *The Journal of Mental Health Training, Education and Practice*, Vol. 11 No. 5, pp. 317-331, doi: 10.1108/JMHTEP-08-2015-0037.

Barbic, S.P., Chan, N., Rangi, A., Bradley, J., Pattison, R., Brockmeyer, K., Leznoff, S., Smolski, Y., Toor, G., Bray, B. and Leon, A. (2019), "Health provider and service-user experiences of sensory modulation

rooms in an acute inpatient psychiatry setting", *Plos One*, Vol. 14 No. 11, p. e0225238, doi: 10.1371/journal.pone.0225238.

Barton, S.A., Johnson, M.R. and Price, L.V. (2009), "Achieving restraint-free on an inpatient behavioural health unit", *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 47 No. 1, pp. 34-40, doi: 10.3928/02793695-20090101-01.

Bensimon, M., Shaul, S., Suki, D., Sandier, L., Teitelbaum, A., Div, S. and Sandler, L. (2018), "Patient-centered approach in closed psychiatric wards: the curative power of relaxing music chosen by patients", *Israel Journal of Psychiatry*, Vol. 55 No. 2, pp. 52-57.

Björkdahl, A., Perseius, K.-I., Samuelsson, M. and Lindberg, M.H. (2016), "Sensory rooms in psychiatric inpatient care: staff experiences", *International Journal of Mental Health Nursing*, Vol. 25 No. 5, pp. 472-479, doi: 10.1111/inm.12205.

Cameron, A., Burns, P., Garner, A., Lau, S., Dixon, R., Pascoe, C. and Szafraniec, M. (2020), "Making sense of multi-sensory environments: a scoping review", *International Journal of Disability, Development and Education*, Vol. 67 No. 6, pp. 630-656, doi: 10.1080/1034912X.2019.1634247.

Chalmers, A., Harrison, S., Mollison, K., Molloy, N. and Gray, K. (2012), "Establishing sensory-based approaches in mental health inpatient care: a multidisciplinary approach", *Australasian Psychiatry*, Vol. 20 No. 1, pp. 35-39, doi: 10.1177/1039856211430146.

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

Champagne, T. and Sayer, E. (2003), "The effects of the use of the sensory room in psychiatry", available at: https://www.ot-innovations.com/wpcontent/uploads/2014/09/qi_study_sensory_room.pdf

Champagne, T. and Stromberg, N. (2004), "Sensory approaches in inpatient psychiatric settings: innovative alternatives to seclusion and restraint", *Journal of Psychosocial Nursing*, Vol. 42, pp. 35-44, doi: 10.3928/02793695-20040901-06.

Champagne, T., Mullen, B., Dickson, D. and Krishnamurty, S. (2015), "Evaluating the safety and effectiveness of the weighted blanket with adults during an inpatient mental health hospitalization", *Occupational Therapy in Mental Health*, Vol. 31 No. 3, pp. 211-233, doi: 10.1080/0164212X.2015.1066220.

Cheng, S.C., Hsu, W.S., Shen, S.H., Hsu, M.C. and Lin, M.F. (2017), "Dose response relationships of multisensory intervention on hospitalized patients with chronic schizophrenia", *Journal of Nursing Research*, Vol. 25 No. 1, pp. 13-20, doi: 10.1097/jnr.0000000000000154.

Colton, D. (2004), "Checklist for assessing your organisation's readiness for reducing seclusion and restraint", Commonwealth Center for Children and Adolescent. Stauntun, VT, available at: https://dbhds.virginia.gov/facilities/ccca/wp-content/uploads/sites/11/2023/05/SR-Checklist-2010.pdf

Craswell, G., Dieleman, C. and Ghanouni, P. (2020), "An integrative review of sensory approaches in adult inpatient mental health: implications for occupational therapy in prison-based mental health services", *Occupational Therapy in Mental Health*, Vol. 37 No. 2, pp. 30-157, doi: 10.1080/0164212X.2020.1853654.

Cummings, K., Grandfield, S. and Coldwell, C. (2010), "Caring with comfort rooms. Reducing seclusion and restraint use in psychiatric facilities", *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 48 No. 6, pp. 26-30, doi: 10.3928/02793695-20100303-02.

Dickens, G.L., Johnson, A., Steel, K., Everett, B. and Tonkin, M. (2022), "Interventions to improve social climate in acute mental health inpatient settings: systematic review of content and outcomes", *SAGE Open Nursing*, Vol. 8, p. 23779608221124291, doi: 10.1177/237796082211242.

Dorn, E., Hitch, D. and Stevenson, C. (2020), "An evaluation of a sensory room within an adult mental health rehabilitation unit", *Occupational Therapy in Mental Health*, Vol. 36 No. 2, pp. 105-118, doi: 10.1080/0164212X.2019.1666770.

Forsyth, A. and Trevarrow, R. (2018), "Sensory strategies in adult mental health: a qualitative exploration of staff perspectives following the introduction of a sensory room on a male adult acute ward", *International Journal of Mental Health Nursing*, Vol. 27 No. 6, pp. 1689-1689, doi: 10.1111/inm.12466.

Gardner, J. (2016), "Sensory modulation treatment on a psychiatric inpatient unit: results of a pilot program", *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 54 No. 4, pp. 44-51, doi: 10.3928/02793695-20160318-06.

Glisson, C., Schoenwald, S.K., Kelleher, K., Landsverk, J., Hoagwood, K.E., Mayberg, S. and Green, P, Research Network on Youth Mental Health (2008), "Therapist turnover and new program sustainability in mental health clinics as a function of organizational culture, climate, and service structure", *Administration and Policy in Mental Health and Mental Health Services Research*, Vol. 35 Nos 1/2, pp. 124-133, doi: 10.1007/s10488-007-0152-9.

Haig, S. and Hallett, N. (2023), "Use of sensory rooms in adult psychiatric inpatient settings: a systematic review and narrative synthesis", *International Journal of Mental Health Nursing*, Vol. 32 No. 1, pp. 54-75, doi: 10.1111/inm.13065.

IBM SPSS® Statistics (2015), "SPSS® statistics",

Knight, M., Adkison, L. and Kovach, J.S. (2010), "A comparison of multisensory and traditional interventions on inpatient psychiatric and geriatric neuropsychiatric units", *Journal of Psychosocial Nursing*, Vol. 48 No. 1, pp. 24-31, doi: 10.3928/02793695-20091204-03.

Lee, S., Cox, A., Whitecross, F., Williams, P. and Hollander, Y. (2010), "Sensory assessment and therapy to help reduce seclusion use with service users needing psychiatric intensive care", *Journal of Psychiatric Intensive Care*, Vol. 6 No. 2, pp. 83-90, doi: 10.1017/S1742646410000014.

Lindberg, M., Samuelsson, M., Perseius, K.I. and Bjorkdahl, A. (2019), "The experiences of patients in using sensory rooms in psychiatric inpatient care", *International Journal of Mental Health Nursing*, Vol. 28 No. 4, pp. 930-939, doi: 10.1111/inm.12593.

Lloyd, C., King, R. and Machingura, T. (2014), "An investigation into the effectiveness of sensory modulation in reducing seclusion within an acute mental health unit", *Advances in Mental Health*, Vol. 12 No. 2, pp. 93-100, doi: 10.1080/18374905.2014.11081887.

Machingura, T. and Lloyd, C. (2017), "Mental health occupational therapy and supported employment", *Irish Journal of Occupational Therapy*, Vol. 45 No. 1, pp. 52-57, doi: 10.1108/IJOT-02-2017-0004.

Maguire, T., Young, R. and Martin, T. (2012), "Seclusion reduction in a forensic mental health setting", *Journal of Psychiatric and Mental Health Nursing*, Vol. 19 No. 2, pp. 97-106, doi: 10.1111/j.1365-2850.2011.01753.x.

Martin, T. and Daffern, M. (2006), "Clinician perceptions of personal safety and confidence to manage inpatient aggression in a forensic psychiatric setting", *Journal of Psychiatric and Mental Health Nursing*, Vol. 13 No. 1, pp. 90-99, doi: 10.1111/j.1365-2850.2006.00920.x.

Meredith, P., Yeates, H., Greaves, A., Taylor, M., Slattery, M., Charters, M. and Hill, M. (2016), "Preparing mental health professionals for new directions in mental health practice: evaluating the sensory approaches e-learning training package", *International Journal of Mental Health Nursing*, Vol. 27 No. 1, pp. 106-111, doi: 10.1111/inm.12299.

Nicholls, D., Kidd, K., Threader, J. and Hungerford, C. (2015), "The value of purpose built mental health facilities: use of the ward atmosphere scale to gauge the link between milieu and physical environment", *International Journal of Mental Health Nursing*, Vol. 24 No. 4, pp. 286-294, doi: 10.1111/inm.12138.

Novak, T., Scanlan, J., McCaul, D., MacDonald, N. and Clarke, T. (2012), "Pilot study of a sensory room in an acute inpatient psychiatric unit", *Australasian Psychiatry*, Vol. 20 No. 5, pp. 401-406, doi: 10.1177/1039856212459585.

Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017), "Thematic analysis: striving to meet the trustworthiness criteria", *International Journal of Qualitative Methods*, Vol. 16 No. 1, pp. 1-13, doi: 10.1177/1609406917733847.

Reddon, J., Hoang, R., Sehgal, T. and Marjanovic, S. (2004), "Immediate effects of snoezelen® treatment on adult psychiatric patients and community controls", *Current Psychology*, Vol. 23 No. 3, pp. 225-237, doi: 10.1007/s12144-004-1022-1.

Schalast, N., Redies, M., Collins, M., Stacey, J. and Howells, K. (2008), "EssenCES, a short questionnaire for assessing the social climate of forensic psychiatric wards", *Criminal Behaviour and Mental Health*, Vol. 18 No. 1, pp. 49-58, doi: 10.1002/cbm.677.

Sivak, K. (2012), "Implementation of comfort rooms to reduce seclusion, restraint use, and acting-out behaviours", *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 50 No. 2, pp. 24-34, doi: 10.3928/02793695-20110112-01.

Smith, S. and Jones, J. (2014), "Use of a sensory room on an intensive care unit", *Journal of Psychosocial Nursing and Mental Health Services*, Vol. 52 No. 5, pp. 22-30, doi: 10.3928/02793695-20131126-06.

Sutton, D. and Nicholson, E. (2011), "Sensory modulation in acute mental health wards: a qualitative study of staff and service users' perspectives", Auckland, New Zealand: Te Pou o Te Whakaaro Nui, available at: https://hdl.handle.net/10292/4312

Sutton, D., Wilson, M., Van Kessel, K. and Vanderpyl, J. (2013), "Optimizing arousal to manage aggression: a pilot study of sensory modulation", *International Journal of Mental Health Nursing*, Vol. 22 No. 6, pp. 500-511, doi: 10.1111/inm.12010.

Te Pou (2020), *Six Core Strategies© Service Review Tool: New Zealand Adaption*, (2nd edition). Te Pou, Auckland.

Te Pou o te Whakaaro Nui (2017), "Implementation of sensory modulation within DHB mental health services 2017 stocktake", Auckland, New Zealand: Author.

Van Doeselaar, M., Sleegers, P. and Hutschemaekers, G. (2008), "Professionals' attitudes toward reducing restraint: the case of seclusion in The Netherlands", *Psychiatric Quarterly*, Vol. 79 No. 2, pp. 97-109, doi: 10.1007/s11126-007-9063-x.

Wiglesworth, S. and Farnworth, L. (2016), "An exploration of the use of a sensory room in a forensic mental health setting: staff and patient perspectives", *Occupational Therapy International*, Vol. 23 No. 3, pp. 255-264, doi: 10.1002/oti.1428.

Wright, L., Bennett, S. and Meredith, P. (2020), "Why didn't you just give them PRN?': a qualitative study investigating the factors influencing implementation of sensory modulation approaches in inpatient mental health units", *International Journal of Mental Health Nursing*, Vol. 29 No. 4, pp. 608-621, doi: 10.1111/inm.12693.

Yin, R. (2014), *Case Study Research: Design and Methods*, (5th ed). Sage, London, UK.

Further reading

Carpenter, J., Milne, D., Lombardo, C. and Dickinson, C. (2007), "Process and outcomes of training in psychosocial interventions in mental health: a stepwise approach", *Journal of Mental Health*, Vol. 16 No. 4, pp. 505-520, doi: 10.1080/09638230701482329.

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