

# The benefits of sensory modulation on levels of distress for consumers in a mental health emergency setting

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## Abstract

**Objectives:** This paper reports a pilot study exploring the benefits of offering sensory modulation within a mental health emergency setting for consumers experiencing distress during a psychiatric presentation.

**Methods:** Seventy-four consumers with a mental health presentation reported on their sensory modulation use experiences during their stay in a South Australian tertiary teaching hospital emergency department. An evaluation form was used to document use of items, self-reported distress pre and post sensory modulation use, and other consumer experiences.

**Results:** Consumers used between one and six sensory items for a median duration of 45 min. There was a statistically significant reduction ( $t(73) = 15.83, p < .001$ ) in self-reported distress post sensory modulation use, and consumers also reported that use was helpful, distracting, calming and assisted in managing negative emotions and thoughts.

**Conclusions:** The results demonstrate the potential value of sensory-based interventions in reducing behavioural and emotional dysregulation in an emergency setting whilst also promoting consumer self-management strategies.

**Keywords:** sensory modulation, mental health, emergency department, distress, least restrictive practice

In Australia, consumers in acute psychiatric and psychosocial distress often seek care and treatment in emergency departments (EDs), with increasing demand on these services documented in the literature.<sup>1–3</sup> A significant proportion of ED presentations involve consumers with symptoms of low or elevated mood, acute agitation, psychosis, distress or behavioural disturbance.<sup>1,2,4</sup> Although consumers report that engagement with mental health clinicians can positively influence their ED experience, they are nevertheless often overwhelmed and anxious, and experience the environment as over stimulating and frustrating due to treatment waiting times.<sup>3,5,6</sup> This can result in escalation in distress and symptoms unless

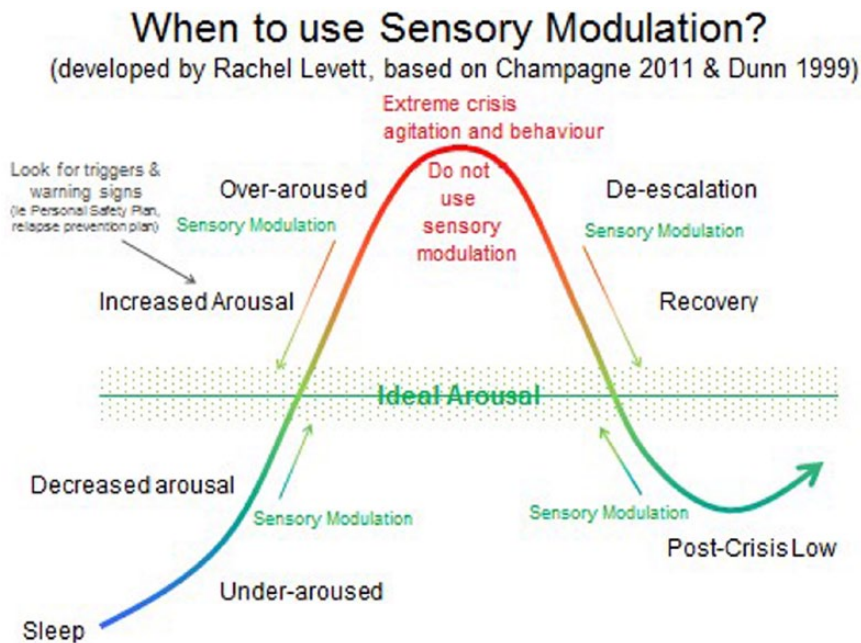
consumers are able to self-regulate their emotions and distract themselves from the environment.<sup>5</sup>

Research shows consumers can experience difficulties with the regulation of sensory input.<sup>7</sup> Additionally, heightened autonomic arousal and emotional dysregulation are thought to contribute to increased uncontrolled behav-

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**Figure 1. Diagram illustrating when to use sensory modulation.**

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our responses such as expressions of distress or anger.<sup>8</sup> In the ED, this may result in aggression or violence, risk of harm or trauma to the consumer or others, use of restrictive measures (e.g. seclusion and restraint), subsequent delays in treatment and longer lengths of stay.<sup>4,9,10</sup>

Sensory modulation (SM) has been identified as a strategy to reduce behavioural disturbance and improve consumer ED experiences when in psychiatric crisis.<sup>5</sup> SM is the use of consumer-preferred sensory input involving proprioception, smell, movement and visual or touch-based tools. SM interventions work by facilitating the self-management of internal distress and arousal, as well as reducing and distracting from environmental stressors to promote function and a sense of control and safety.<sup>7,8</sup> Clinical policy directives identify SM as a strategy to 'address triggers such as boredom, frustration, restlessness and over- or under-stimulation, that can lead to challenging behaviours'.<sup>11</sup> Although studies have demonstrated the benefit of SM use in psychiatric intensive or high-dependency units,<sup>12,13</sup> to our knowledge no studies have examined use in an ED. This paper presents a pilot study of one such attempt to use SM in the ED environment.

## Method

### Design

This research was a pilot evaluation of a practice improvement project. It followed principles of least-restrictive practice reflected in state policy by offering a proactive management strategy for persons experiencing distress in the ED.<sup>11</sup>

## Setting

The setting was the ED of a major tertiary teaching hospital in South Australia with a dedicated mental health team. In this ED, consumers who were triaged as requiring specialist mental health assessment were allocated to one of the clinical treatment areas whilst awaiting either assessment, preparation for discharge or allocation to an acute bed in another unit or site. The clinical areas included cubicles within the general ED (up to 24-hour target length of stay), an attached mental health emergency care unit and a temporary mental health unit (up to 72-hour target lengths of stay).

## Procedure

The research was approved by the hospital's Human Research Ethics Committee (HREC/15/RAH/242) and the study was completed between September 2015 and August 2016. Following clinical handover, the third author, an occupational therapist, identified suitable consumers for SM intervention based on risk assessment and clinical judgement using an organisational clinical protocol that describes safe and effective use of SM, including an illustration showing when to use SM (Figure 1). Consumers were offered SM items from a mobile trolley or sensory box and, if taken up, consumers engaged with preferred items for as long as they wished. In all but one case, SM was initiated by the occupational therapist, with one consumer specifically asking to use SM items.

During the research, 328 consumers were approached, with 187 utilising the intervention. An evaluation form

**Table 1. Consumer demographics/clinical information and sensory modulation use information**

Gender	Female ( <i>n</i> )	47 (63.5%)
	Male ( <i>n</i> )	27 (36.5%)
Age	M (SD)	34.0 (10.7)
	Range	17–60 years
Diagnosis/presenting issue <sup>a</sup>	Mood disorders ( <i>n</i> )	25
	Neurotic, stress-related and somatoform disorders ( <i>n</i> )	19
	Disorders of adult personality and behaviour ( <i>n</i> )	17
	Schizophrenia, schizotypal and delusional orders ( <i>n</i> )	9
	Mental and behavioural disorders due to psychoactive substance use ( <i>n</i> )	7
	Suicidal ideation/suicide attempt ( <i>n</i> ) <sup>b</sup>	28

<sup>a</sup>Recorded using the International Statistical Classification of Diseases and Related Health Problems-10 (ICD-10); *n* > 74 as consumers often had multiple recorded diagnoses.

<sup>b</sup>If consumer was suicidal this was also recorded with diagnosis.

M: mean; SD: standard deviation.

was developed (based on Novak et al.<sup>14</sup>), to record consumer demographics, SM use details, consumer self-reported distress pre and post intervention on a scale of 0 to 10 (10 being extreme distress) and consumer responses to the occupational therapist asking them about their experiences of SM within this setting.

### Analyses

Descriptive analyses (e.g. frequencies, means, standard deviations, medians and ranges) were conducted to examine consumer demographics, use of SM items and distress scores pre and post SM use. A dependent *t*-test was conducted to assess whether there was a statistically significant change in participants' distress scores from pre SM use to post SM use, with statistical significance set at  $p < .05$ ; an effect size was calculated to assess the magnitude of the observed effect. Pearson's correlation coefficient was conducted to examine the relationship between the number of items used and change in distress scores. Open-ended responses were analysed using coding and categorising of consumer responses into recurring themes.

## Results

### Participants

Of the 187 consumers who used the SM intervention, 74 (39.6%) agreed to the use of their data in the research component. Table 1 presents the consumer demographics and clinical information.

### SM use and experience

Table 2 provides details of SM use. Most consumers were seen in the mental health emergency care unit ( $n = 64$ ,

86.5%), with SM items predominantly used in consumers' cubicles ( $n = 40$ , 54.1%). Consumers engaged in SM a median of two days (interquartile range (IQR) = 1–3 days) into their ED/hospital stay. Consumers used SM items for between 20 min to 2.5 h, and used between one and six types of items at a time.

Overall, consumers self-reported that their distress significantly decreased from pre SM use ( $M = 6.6$ ,  $SD = 2.2$ , standard error (SE) = 0.3) to post SM use ( $M = 3.6$ ,  $SD = 2.0$ ,  $SE = 0.2$ ),  $t(73) = 15.83$ ,  $p < .001$ ,  $r = .88$  (large effect size). In all cases, self-reported distress was lower subsequent to SM use ( $n = 70$ ) or remained the same as before SM initiation ( $n = 4$ ). Consumers reported a mean change of 3 points in distress levels ( $SD = 1.7$ , range = 0–8).

The most commonly used individual SM items were coloured lights ( $n = 61$ ) and hand fidgets ( $n = 61$ ) (Table 3). There was a significant correlation of small–medium magnitude between numbers of items used and distress score change, with consumers who used more items reporting a greater reduction in distress,  $r = .26$ ,  $p < .05$  (two-tailed).

In open-ended responses, consumers identified SM use as improving their ED experience (Table 4).

Of the 74 consumers, 73 commented that they found the experience as positive, helpful or good (one other participant stated it would likely benefit others). In particular, SM was seen as being helpful as it provided a distraction, was calming and promoted strategies for self-management of distress.

Consumers who experienced SM as distracting ( $n = 28$ ) commented that it took their mind away from distressing thoughts and feelings, relieved boredom and could be fun.

**Table 2. Sensory modulation use details**

SM use area	Mental health emergency care unit	64
	Temporary mental health unit	7
	General ED	3
Location of SM use	Consumer cubicle	40
	Consumer bedroom	30
	Interview room	1
	Temporary SM room	1
	Missing data	2
Day following ED presentation when SM used	Mdn (IQR) days	2 (1–3 days)
	1 day	18
	2 days	23
	3 days	19
	4 days	6
	5 days	1
	6 days	0
	7 days	1
	8 days	1
	Missing data	5
Duration of SM use	Mdn minutes	45
	Range (IQR)	20 min–2.5 h (30–60 min)
Number of items used	Mdn	3
	Range (IQR)	1–6 (3–4 items)

SM: sensory modulation; ED: emergency department; Mdn: median; IQR: interquartile range.

**Table 3. Numbers of consumers who utilised SM items, pre and post SM distress scores and mean changes in distress scores**

<i>Item</i>	<i>n (%)</i>	<i>Pre SM use M (SD)</i>	<i>Post SM use M (SD)</i>	<i>Distress score change<sup>a</sup> M (SD)</i>
Hand fidgets	61	6.8 (2.3)	3.6 (2.0)	3.2 (1.7)
Coloured lights	61	6.8 (2.2)	3.6 (1.9)	3.2 (1.7)
Weighted blanket	44	6.8 (2.1)	3.5 (1.9)	3.3 (1.6)
Coconut sand	17	6.2 (2.8)	3.1 (1.9)	3.1 (1.4)
Lollies/candy	11	7.4 (1.4)	4.4 (.9)	3.0 (1.7)
Other olfactory items (e.g. fresh rosemary leaves or lavender)	15	6.0 (2.5)	3.2 (1.9)	2.8 (1.6)
Other tactile items (e.g. bubble wrap, sensory water beads)	13	6.0 (2.1)	2.9 (2.4)	3.1 (1.4)
Other visual items (e.g. Bright LED soft pillow, sea shells, sand timer)	7	5.1 (3.1)	3.4 (2.6)	1.7 (1.7)
Other (e.g. guitar, massage pad)	11	7.6 (1.7)	4.5 (1.9)	3.2 (2.4)

<sup>a</sup>Since consumers often used multiple types of sensory modulation, change scores for each individual item/type of intervention do not represent change solely as a result of using that specific item.

SM: sensory modulation; M: mean; SD: standard deviation.

**Table 4. Experiences of consumers using SM**

<i>Consumer experiences</i>	<i>Example quotes</i>
SM as positive/helpful/good ( <i>n</i> = 73)	'It was very, very relaxing; it made me feel like not thumping anyone' (C43). 'Stress ball use and sand timer makes me feel that my life is slowing down' (C55).
SM as distraction ( <i>n</i> = 28)	'I found it to be great for distraction, rather than bite my nails off until they bleed. If I was not distracted with these given things to feel and play with I would have no skin on my hands as well' (C7). 'Very positive experience, felt distracted – particularly when I couldn't have any medication to calm me down due to recent overdose' (C50).
SM as calming ( <i>n</i> = 25)	'I feel a lot more calmer than how I have been for last 2 hours' (C63). 'My anxiety hasn't escalated, I feel more relaxed and calm. Has helped my negative thoughts and stay positive' (C74).
SM as self-management tool ( <i>n</i> = 9)	'This made me feel positive and hopeful that I would leave here with things to help me now and in the future' (C4). 'I was unaware of such treatment and it has given me new hope to tolerating stress' (C3).

SM: sensory modulation.

SM was also experienced as calming (*n* = 25), with the intervention assisting consumers to manage thoughts and feelings associated with agitation and anxiety. Some consumers identified specific items that helped them to relax, slow their thought processes and alter their mood. In particular, 11 participants experienced weighted modalities (e.g. weighted blanket) as providing a sense of security, safety and comfort.

A smaller number of participants (*n* = 9) suggested SM use provided them with new strategies to promote self-management of distress and would assist to cope in their daily life once they returned home.

## Discussion

SM was shown to be beneficial in reducing distress within an ED setting for consumers presenting with a range of psychiatric and psychosocial conditions. Consumers reported a decrease (or no escalation) in distress subsequent to using sensory modalities, with those using multiple items reporting a greater decrease in distress. Consumers identified SM as a helpful and positive experience, providing distraction, calming strategies and self-management of distress and emotions during psychiatric crisis. Results support policy directives that advocate for SM as a least restrictive strategy to be embedded in clinical practice.<sup>11,15</sup>

SM offers consumers an intervention for the self-management of psychiatric distress and does not rely on approaches requiring higher cortical functions such as problem solving and verbal de-escalation.<sup>8</sup> In the absence of a fully equipped sensory room, SM can be offered as a cost-effective intervention (items are relatively inexpensive to stock and maintain) by

trained staff in consumers' cubicles or bedside, and via mobile trolleys and sensory boxes. In EDs, which are often under resourced and restricted in space, SM programmes can be adapted to the clinical environment.

Following this pilot study, occupational therapy services have focused on staff education and awareness of the benefits of SM. Links are being developed to establish the continuity of SM use across acute and community settings. With continued moves to reduce coercive practices and improve the consumer experience in the context of increasing ED mental health presentations,<sup>1-3,5</sup> SM has the potential to facilitate culture change towards least restrictive practice options in the ED.

The pilot study was small and has limitations. In particular, consumers rated their distress on a one-item measure.<sup>14</sup> Although consumers offered rich qualitative information via short open-ended questions, a control group would provide baseline data with which to compare the results.

Self-reported distress is a useful marker of consumer experience, but further research is recommended to explore if there is a relationship between SM use and improvement in the safety and quality of care such as use of medication, calls for assistance in incidents of aggression/violence, and seclusion and restraint. In addition, further exploration of ways to embed SM as a whole-team approach in daily clinical practice is recommended. Consumer reports that SM provided a self-management strategy suggests the potential benefits of SM beyond the hospital setting. Embedding SM within community care plans could enhance the self-management of distress at home, potentially avoiding ED presentations.

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