

# Sensory-based intervention for management of maladaptive behaviours in people with dementia

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## INTRODUCTION

Maladaptive behaviours such as agitation occur in up to 90% of patients during the course of dementia<sup>1</sup>; those in moderate-to-advanced stages being the most vulnerable group.<sup>2</sup> If not properly managed, undesirable consequences include staff avoidance, reduced quality of life, excess disability, and caregiver distress.<sup>3,4</sup>

It has been postulated that individuals with dementia have a decreased cognitive ability to process incoming sensory stimuli and a low stress threshold. Maladaptive behaviours occur when unmediated stimuli accumulate to a point exceeding the stress threshold.<sup>5</sup> According to the model of sensoristasis and imbalance,<sup>6</sup> it has been postulated that the imbalanced pacing of sensory-stimulating and sensory-calming activities may lead to maladaptive behaviours and intra-psychic discomfort in such persons. Sensory overload and sensory deprivation are two forms of imbalance. The use of sensory-based intervention (SI) as a management strategy of maladaptive behaviours has been supported by two rationales: (1) maintaining a state of sensoristasis<sup>6</sup> and (2) using a less-threatening medium to capitalise on residual sensory-motor capabilities.<sup>7,8</sup>

In this study, music was the primary medium of the SI. Previous research has reported the positive effects of music as an intervention for agitated behaviours in people with dementia. Some researchers used quiet and relaxing music to create a consistent and calming environment for individuals with agitated behaviours.<sup>9,10</sup> Other used preferred/individualised music that was meaningful to the

individual as a means of eliciting positive feelings and behaviours.<sup>11,12</sup>

## CASE REPORTS

This paper discusses the clinical use of SI to manage the maladaptive behaviours in three nursing home residents with dementia. Maladaptive behaviours, in this study, referred to behavioural disturbances in people with dementia giving rise to excessive agitation, verbal aggression, or activity. Potential subjects meeting these criteria were solicited from a nursing home. Eight subjects were initially selected. Thereafter, the Cohen-Mansfield Agitation Inventory<sup>13</sup> was used to assess the nature and frequency of behaviours presented by these subjects over two half-day observation periods. Three subjects were subsequently chosen, because of their consistent, high-frequency agitated behaviours.

Subject 1 was a 78-year-old woman with moderate dementia, who obtained a Mini-Mental State Examination (MMSE) score of 13. She displayed repetitive and excessive movements including frequent tapping on the tabletop of the chairs that she was sitting in, and grabbing and shaking nearby objects. She was subjected to a waist restraint, because of her previous record of falls. No resident was arranged to sit beside her due to her grabbing behaviours.

Subject 2 was a 66-year-old woman in the advanced stages of dementia (MMSE=5). She was mostly disoriented and unable to communicate verbally. Screaming and pushing herself up from the chair were two frequently displayed maladaptive

**TABLE**  
**Operational definition and recording of agitated behaviours in each subject**

Subject No.	Maladaptive behaviours	Operational definition	Modified event recording	Mean inter-observer agreement (range) [%]
1	Repetitive and excessive movements	Tapping tabletop of the chair and shaking nearby objects (excluding actions such as gentle touching and sweeping surface of objects)	15-second interval	97 (95-98)
2	Excessively noisy	Screaming and verbal utterances (including unidentifiable noises)	30-second interval	90 (81-94)
	Excessively active (fidgeting)	Putting legs on the seat, pushing body up from the chair	30-second interval	95 (89-98)
3	Excessively active (fidgeting)	Leg swinging and pushing body up from the chair	15-second interval	92 (88-95)
	Repetitive and excessive movements	Rocking chairs	30-second interval	94 (90-96)

behaviours. Her screaming and shouting was disturbing and disliked by her fellow nursing home residents. She was also subjected to a body restraint, to prevent her from sliding off the chair.

Subject 3 was a 69-year-old man with an MMSE score of 10. He was responsive when being talked to, but had great difficulty in comprehension and expression. His main behavioural disturbances were rocking on his chair and leg swinging. The rocking behaviour was considered dangerous because of its large magnitude. His leg-swinging behaviour also imposed danger to those who walked past him.

All three patients had very limited communication skills and did not participate in any form of activity in the nursing home, and therefore they spent most of the daytime idling and not communicating their needs and wants to others.

Individually based SI was structured as a management strategy for the maladaptive behaviours displayed by these three individuals. The whole SI programme consisted of eight 30-minute sessions, over a period of 4 weeks. Each SI session consisted of two sensory-based activities and was carried out in a quiet and comfortable room. The first activity was hand massage, while the subject sat comfortably on an armchair and listened to their favourite musical pieces. The second activity encouraged the active participation; the subjects were asked to clap hands, move their body parts, and/or play musical instruments along with the musical rhythms. These two activities were designed to be non-threatening and provide a calming and supportive environment.

An applied-behavioural-analysis single-subject methodology was used to explore the clinical effects of the SI programme. Maladaptive behaviours in each subject were logged—prior to (phase A<sub>1</sub>) and after (phase A<sub>2</sub>) the SI programme. The behavioural charting pertaining to both phases A<sub>1</sub> and A<sub>2</sub> was conducted, under the patients' natural environments, in the course of six 30-minute sessions over a 3-week period. The SI programme provided to each client (phase B) covered a 4-week period. Behavioural charting was conducted in 1-hour session immediately after each SI session. Modified event recording, using a 15- or a 30-second interval, was adopted for behavioural charting. The **TABLE** shows the operational definition of the targeted behaviours, the recording method, and the percentage of inter-observer agreement obtained in at least 20% of the sessions for each subject.<sup>14</sup> Two observers independently performed the recording, with inter-observer agreement ranging from 81 to 98%.

The **FIGURE** shows the occurrence of maladaptive behaviours (in percentage terms) for the three subjects during the three phases. Notably, subject 3 was ill shortly after the SI programme was completed. He was found to be sleepy and displayed few maladaptive behaviours during charting sessions 15 and 16; he had to stay in bed from session 17 onwards, so behavioural charting was discontinued. It is evident that there was a decrease in the occurrence of maladaptive behaviours in all three patients during the intervention phase. Nonetheless, the maladaptive behaviours returned to the baseline level after the SI programme was completed. During the SI sessions, the three subjects appeared more alert and responsive and demonstrated positive behaviours. For instance,

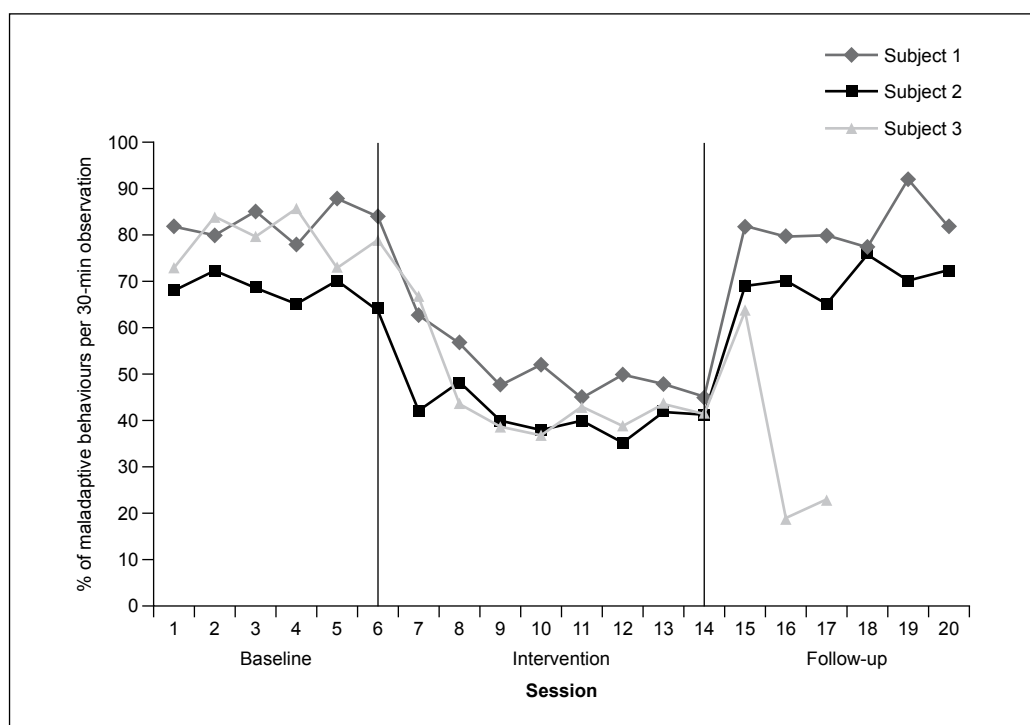


FIGURE. Occurrence of maladaptive behaviours in the three subjects during the three phases

subject 1 carried out meaningful conversations with the researcher, initiated to hold the hand of the researcher, and moved and sang along with the music.

## DISCUSSION

These case studies suggest the potential value of SI in reducing maladaptive behaviours displayed by individuals with dementia. A particular strength of such SI is that it capitalises on the spared sensory-motor functions of individuals with moderate-to-advanced dementia<sup>6</sup> rather than dwelling on their impaired cognitive function. Thus, it provides an enabling environment for participation. Moreover, the provision of structured sensory stimulation assists individuals with moderate-to-advanced dementia to process incoming sensory stimuli in a meaningful and manageable manner. These findings are consistent with previous studies, showing that individuals with dementia become quiet and calm during sessions using SI.<sup>9,12</sup> Also, the act of playing musical instruments and moving body parts along with music facilitates individuals with dementia to engage in procedural and imaginary play behaviours under a supportive environment.<sup>15</sup> However, the benefits of SI do not carry over to other situations

after the sessions were finished. This lack of carry-over effect has been identified in a Cochrane review on multi-SI for dementia.<sup>16</sup>

As this work adopted a single case study design methodology for exploring the values of SI in the management of maladaptive behaviours in individuals with dementia, it had some inherent limitations. These include: the small sample size, not having a control group, and the lack of standardised, validated outcome measures. The clinical efficacy of SI for reducing maladaptive behaviours needs to be confirmed in future studies, using an experimental design methodology.

There are two practice recommendations for using SI in dementia care. First, SIs are better designed and implemented as a continuous therapeutic programme, that integrates with the routine care of individuals who display frequent maladaptive behaviours. Second, the sensory preferences of individuals can be incorporated into the overall planning of the sensory-based activities.

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