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An evaluation of the clinical effectiveness of a multisensory therapy on individuals with learning disability

Key Messages

1. Multisensory therapy (MST) was not superior to activity sessions in reducing problem behaviours; MST did not improve discharge rate or reduce medication use.
2. Key environmental variables in the MST that influence behaviour may be related to reliability, predictability, relaxation, freedom from demand, and the relationship with the therapist. Clients' problem behaviour might be reduced if these variables are constantly presented in the ward environment.

Introduction

Many individuals with learning disability (mental retardation according to Diagnostic and Statistical Manual of Mental Disorders, 4th edition) are residents in mental hospitals. They constitute 12.5% of the total population in such a local hospital with an average hospital stay of 300 days/year. Apart from the learning disability, the majority have mental health problems, such as behavioural disorders, psychosis, and schizophrenia. The institutional life in hospitals has always been criticised as unstimulating; inadequate psychological stimulation was believed conducive to aggressive and other maladaptive behaviour, including stereotypical self-stimulation behaviour (SSB). As these behaviours interfere with learning and care home placement, there is a need to reduce or modify them. Multisensory therapy (MST) aims to induce sensory stimulation, leisure, enjoyment, and relaxation in people with learning difficulties and may enable more positive behaviours. The aim of this project was to evaluate the immediate and longer-term efficacy of MST in moderating the behaviour of subjects with learning disability.

Methods

Study design

Over the period May 2001 to November 2002, a randomised controlled trial was used to compare the effects of 36 standardised MST sessions with 36 standardised activity sessions. Participants in the experimental arm were divided into groups of 5 or 6 (according to their intelligence quotient) to attend 1-hour MST sessions on alternative days for 12 weeks; a nurse specialist acted as carer and enabler. Whilst not unnecessarily interfering or correcting subjects' behaviour, the nurse prompted and encouraged subjects to explore the environment on their own as far as possible and to touch objects of their choice. Subjects in the control arm participated in activity sessions conducted by nurses or occupational therapists. Both groups continued to receive standard care (including drugs) in the wards. After the 12-week intervention, apart from standard care and drug treatment, all interventions were stopped to assess the sustainable effects.

Study instruments

Trained research assistants conducted all assessments. The immediate efficacy of the MST was assessed by: (1) level of relaxation (based on the behavioural relaxation scale¹), (2) pulse rate (an additional indicator of relaxation), (3) emotional state (recorded using the Snoezelen Diary Card²). All assessments were made immediately before and after each session.

Longer-term efficacy was assessed by: (1) frequency of aggressive behaviour (measured by the Checklist of Challenging Behaviour^{3,4}), (2) frequency of maladaptive and adaptive behaviour (measured by the Behaviour Checklist⁵). These assessments were carried out for both arms before the intervention, at mid-intervention, immediately after intervention, and 5 and 12 weeks later.

The research assistants conducted a semi-structured interview at the end of the intervention period for all the registered nurses who cared for the clients. The aim of the interview was to understand nurses' perceived benefits and difficulties

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Table 1. Demographic data of the participants

Demographic data	Experimental group (n=48) No. (%)	Control group (n=41) No. (%)
Gender		
Female	29 (60)	24 (59)
Male	19 (40)	17 (41)
Age (years)		
11-20	4 (8)	3 (7)
21-30	13 (27)	9 (22)
31-40	13 (27)	11 (27)
41-50	10 (21)	8 (20)
51-60	4 (8)	8 (20)
61-70	4 (8)	0
≥71	0	2 (5)
Level of developmental disability		
Mild	22 (46)	22 (54)
Moderate	14 (29)	11 (27)
Severe	12 (25)	8 (20)
Diagnosis of mental disorder		
Schizophrenia/psychosis	29 (60)	24 (59)
Behavioural disorders	12 (25)	11 (27)
Personality disorders	7 (15)	6 (15)

Table 2. The pulse rate immediately before and after session of the two groups

Group	Pulse rate before session (beats/min) Mean (SD)	Pulse rate after session (beats/min) Mean (SD)	Frequency (P value)
Experimental	79 (3.5)	77.2 (3.6)	3.32 (0.34)
Control	81.4 (3.4)	80.6 (3.3)	

in the implementation of MST.

The use of medication in both groups was monitored and compared throughout the study period and any changes noted. To assess the longer-term effects, all trial subjects were monitored for a further 6 months for their discharge rate (to home or other institutions) after the post-intervention assessments.

Results

Results were analysed on an intention-to-treat basis. There were no statistically significant baseline differences between the groups with respect to demographic variables (Table 1).

Immediate efficacy of the interventions

Analysis of variance applied to pulse rates, yielded no significant differences between immediate pre and post intervention values or between corresponding values in the two treatment arms (Table 2). Similarly there was no immediate efficacy of MST based on behavioural relaxation scale and Snoezelen Diary Card findings, analysed by paired *t* tests (Table 3).

Longer-term efficacy of the intervention

Behavioural outcomes

Table 4 shows the mean scores and standard deviations

Table 3. Behavioural relaxation scale (BRS) and Snoezelen Dairy Card (SDC) before and after multisensory therapy (MST) in the experimental arm (n=48)

Outcome measures	Before MST Mean (SD)	After MST Mean (SD)	<i>t</i> (P value)
BRS, total score	20.7 (1.57)	16.53 (1.4)	1.03 (0.001)
SDC			
Positive mood (happy, relax), total score	3.3 (0.4)	11.7 (0.9)	5.86 (0.001)
Negative mood (agitated, depressed), total score	2.3 (0.9)	0.45 (0.2)	2.18 (0.03)
Neutral mood, total score	15.3 (1.2)	3.7 (0.3)	7.53 (0.03)

Table 4. Behavioural outcome measures of both groups

Outcome measures	Session	Experimental group (n=48) Mean (SD)	Control group (n=41) Mean (SD)
Checklist of Challenging Behaviour total score	Pre	4.0 (1.0)	2.7 (0.8)
	Mid	4.0 (1.0)	2.1 (0.7)
	Post-1	3.8 (0.8)	1.1 (0.4)
Behaviour checklist	Post-2	3.2 (0.7)	1.7 (0.2)
	Post-3	3.0 (0.8)	1.7 (0.2)
	Pre	30.3 (4.4)	27.7 (2.5)
Self-stimulating behaviour total score	Mid	23.0 (4.6)	26.5 (4.5)
	Post-1	25.2 (4.4)	24.5 (4.0)
	Post-2	24.2 (3.9)	25.2 (3.5)
Adaptive behaviour total score	Post-3	19.7 (3.7)	20.4 (3.5)
	Pre	15.4 (1.0)	17.8 (2.9)
	Mid	14.6 (1.9)	15.3 (1.2)
Behavioural relaxation scale (BRS) total score	Post-1	12.9 (1.7)	13.0 (1.0)
	Post-2	12.0 (1.9)	12.3 (2.0)
	Post-3	12.1 (1.9)	13.5 (1.5)

for all the repeated longer-term behavioural outcome measures. Both intervention arms showed a reduction in aggressive behaviour as rated by the Checklist of Challenging Behaviour over time; analysis of variance indicated that overall within-group differences were not significant for both arms ($F=2.75$, $P=0.10$). However, there were significant differences between the mid and post-1 assessment ($F=4.26$, $P=0.04$); the controls revealed greater improvement than the experimental arm at those time points. There were also significant differences between the post-2 and post-3 assessment ($F=4.22$, $P=0.04$). The experimental arm enjoyed more improvement than controls at the final assessment.

Discharge rate

Six months after the intervention, in the experimental arm there had been 12 discharges (four to general hospitals because of physical illnesses and the rest to residential care). In the controls there were 15 discharges (three to general hospitals for illness and the rest to residential care). There was no significant difference in discharge rate between the two arms.

Medication use

There were changes in the use of medications for all

Table 5. Benefits and difficulties of implementing multisensory therapy

Benefits	Promote positive emotion Improve social interactions Provide sensory stimulation
Difficulties	Crowded room, lack of change Failure to meet individual needs

participants (increased or decreased dosages and change of drugs). The mean cost of medication per day for each client in both arms at each assessment point was estimated. The estimated mean cost of medication per day for both groups had increased at the 50th week post intervention when compared to that in the first week. Both therapies showed no long-term benefits in terms of medication use.

Semi-structured interviews

Ten registered nurses working with the learning disability subjects were interviewed at the end of the intervention period, their responses were analysed and the ensuing meaningful entities related to the benefits and difficulties of implementing MST identified and coded are shown in Table 5.

Many nurses perceived positive changes in subjects' behaviour and emotions after the therapy, such as mentally more stable, being happier, more active, and had better social interaction. Those exposed to MST, explored the environment with others, learnt to relate to each other and improved social skills during the intervention. Many informants agreed that the MST provided sensory stimulation to clients. The room contained several different types of sensory-stimulating equipment, such as lamps and bubble tubes that seemed to improve their sense of well-being and positive emotions. On touching the equipment, lights and colours changed, inducing a sense of more control over the environment, which also promoted positive emotions. The dim lights and soft music evidently helped subjects relax and be happier and less anxious.

Discussion

Evidently MST had an immediate effect on emotions, patients were rated as happier and more relaxed; increased positive emotions and less negative emotions were displayed. The qualitative data from nurses supported the quantitative measurements. Some subjects with learning disabilities may have had a degree of sensory deprivation, and the hospital environment may not provide them with appropriate stimuli, though they received more and qualitatively different stimulation than normal. This extra stimulation may allow subjects to become engaged and focused on the environment around them, promoting more positive emotions.

Despite positive immediate effects, this study showed no superior efficacy for MST according to the Checklist of Challenging Behaviour, SSB, and adaptive behaviour. Nor

was MST associated with long-term benefits or significant changes in the discharge from hospital rate and medication use.

Unlike previous studies reporting positive effects of MST,⁶ this study entailed controls as well as objective and standardised assessments by trained assessors, as opposed to pre- and post-test assessment only. Alternatively the nature of the sessions in both arms (MST and standard) may have differed, as both activities were not demanding and predictable. The therapists provided verbal and physical attention to the subjects in both arms of the study, which might have had some positive impact on emotion and behaviour.

Although there were positive changes for some subjects, others did not benefit from MST; many informants commented on its limitations, including the very crowded room and a lack of change in the environment. The multisensory room was only 300 square feet in area and became crowded when five to six subjects, two research assistants and the nurse specialist were in the room at the same time. This might reduce the therapeutic effect. Furthermore, there was little change to the environment over time. Some subjects became bored after a few sessions. Furthermore they had different intelligence quotients and different needs; thus, group intervention might not be able to satisfy individual needs.

The results of this study were similar to those of another report suggesting some effect by merely participating in an investigation.⁷ These effects related primarily to the working relationship between subjects and enabler and manifested in terms of increased physical contact, increased tolerance to physical contact and overall compliance and were not specific to the MST. The critical components of a 'therapeutic' MST may have very little to do with the environment itself, whereas the nature of the interactions within the environment could be critical.⁷ Key environmental variables in the MST may stem from reliability, predictability, relaxation, and freedom from demands rather than the sensory input. Problem behaviour may become reduced if these characteristics are constantly present in the ward environment.

Conclusion

The findings of this study support the original philosophy behind the use of MST, which was one of providing a leisure resource for promoting psychological well-being, rather than a therapy for reducing problem behaviours. The therapy may benefit some participants (eg the moderate to severely impaired), but not those who have mild impairment. It may help to address problems under stimulation and make the ward a more pleasant environment. The promotion and enhancement of relationships could have valuable benefits in terms of well-being. However, health care professionals have to explore other alternatives for reducing problem

behaviour.

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