

Effects of Four Therapy Procedures on Communication in People with Profound Intellectual Disabilities

William R. Lindsay, Esther Black and Sarah Broxholme

Tayside Primary Care NHS Trust and University of Abertay, 1 Edward Street, Dundee, DD1 5NS, UK

Deborah Pitcaithly and Nicola Hornsby

Fife Primary Care NHS Trust, UK

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A number of alternative therapies have recently been employed with people who have intellectual disabilities (IDs). The present study examines the effects of four frequently used therapies on the communication of people with profound ID. Communication was assessed using five measures of positive communication and five measures of negative communication. The therapies assessed were Snoezelen, active therapy, relaxation and aromatherapy/hand massage. There were eight participants in the present study and each received all four of the therapeutic procedures in a counterbalanced design. Treatment procedures were videotaped at sessions 5, 10, 15 and 20, and later scored for defined measures of communication. Both Snoezelen and relaxation increased the level of positive communication and had some effect on decreasing negative communication. However, active therapy and aromatherapy/hand massage had little or no effect on communication. The lack of a no-treatment control is noted, especially in the light of trends seen at baseline. Considering the lack of generalization of therapeutic effects, the present results should be treated with caution.

Introduction

During the past decade, a number of therapies have been introduced for use with clients who have profound intellectual disabilities (IDs) to help increase their quality of life. These therapies include aromatherapy and hand massage, art therapy, music therapy, Snoezelen, relaxation, and rebound or active therapy. Although many of these therapies have become more widely used and accepted, very little research has been carried out to establish the efficacy of the procedures. Previous studies by the first author (W.R.L.) have looked at the effects of four of these therapies on concentration and responsiveness. The results indicated that both Snoezelen and relaxation produced significant improvements in concentration over time, whereas the aromatherapy/hand massage and active therapy conditions showed no improvement. Only slight improvement was seen in relaxation and enjoyment of the subjects throughout the sessions (Lindsay *et al.* 1997). However, the above research only looked at one aspect of the difficulties experienced by individuals with profound ID. The current paper is an initial investigation into the effect of four therapies on another area, i.e. communication. The same four therapies [i.e.

aromatherapy/hand massage, relaxation, Snoezelen and active therapy (bouncy castle)] were evaluated.

Exercise is one possible form of therapy used with individuals with profound ID. The therapeutic effects of exercise with this client group include improvements in physical fitness (Tomprowski & Ellis 1984), and decreases in behavioural problems including self-injury and stereotypies. Over the years, a number of different forms of exercise have been used and a variety of results have been reported (Lancioni & O'Reilly 1998). Rebound therapy (i.e. exercise using a trampoline) has been used because of its flexibility for use with clients with a wide range of ability. In particular, it is suitable for use with those who have physical disabilities since they can exercise with help from a therapist. Although this form of therapy is widely used with this client group, few studies have been carried out which evaluate its effectiveness. Observations of the therapeutic effect of rebound therapy include increased physical fitness, body awareness, relaxation and enjoyment, as well as increases in vocalization and eye contact (Smith & Cook 1990). A bouncy castle was used instead of a trampoline in the present study to evaluate the effects of active therapy in relation to the other therapies assessed.

The 'Snoezelen' concept was developed by Hulsegge & Verheul (1987) in Holland in 1979 and is now a widely accepted form of therapy for those with IDs in many countries. It is based on the belief that sensory and motor modalities are the primary method by which those with profound IDs interact with their environment (Cunningham *et al.* 1991). Snoezelen is performed in a room which is blacked out so that external stimulation is limited. The room contains a range of sensory stimulation, including visual, auditory and olfactory elements. The environment is variable according to the preferences of the individuals involved.

Studies looking at the efficacy of Snoezelen are limited since the developers felt that formal evaluation would force the environment into a more product-orientated, objective dimension (Hulsegge & Verheul 1987). However, a preliminary study carried out by Long & Haig (1992) indicated that some positive change in behaviour occurred following a period in a sensory/Snoezelen environment. A more recent study has shown that Snoezelen results in significant decreases in maladaptive behaviours in children with ID (Shapiro *et al.* 1997). Snoezelen has been found to have a positive effect on concentration in individuals with profound IDs (Lindsay *et al.* 1997). However, in a carefully controlled study involving 27 subjects, Martin *et al.* (1998) found that, while some individuals became more relaxed in the Snoezelen environment, this had no generalized effect outside the sessions or on challenging behaviour. The above authors concluded that Snoezelen had no effects beyond those which could be ascribed to the social interaction involved in the process.

The ability to achieve a calm and relaxed state has been shown to be both physically and psychologically beneficial. Numerous studies have been carried out which have investigated the most effective method of achieving this for individuals with IDs (Hegarty & Last 1997). Schilling & Poppen (1983) developed behavioural relaxation training (BRT), which relies on modelling relaxed postures rather than on focusing on both states of tension and relaxation, as in abbreviated progressive relaxation (APR). Lindsay & Baty (1986) piloted the use of BRT with individuals with moderate and severe IDs, and showed the technique to be of benefit to this client group. Lindsay *et al.* (1996) have recently extended this research to include individuals with profound IDs.

Aromatherapy is the use of essential oils extracted from a variety of plants to promote health and alleviate certain conditions (Ryman 1984; Wise 1989). Its popularity and

acceptability grew dramatically during the previous century (Wise 1989). The use of aromatherapy is often combined with massage and reports have indicated that relaxation, reduced anxiety and calm can be the results of an aromatherapy massage (Wise 1989). However, although there have been several anecdotal reports, it appears that no scientific studies have been carried out to examine the effects of aromatherapy/massage on the population with profound ID.

It has been shown that 50% of individuals with IDs have severe language problems (Howlin 1987) and this percentage will be much greater in those with a profound ID. The majority of those with profound IDs are either pre-verbal or non-verbal, and as a result, use non-verbal means of communication. Non-verbal communication includes non-vocal aspects such as gesture, eye contact and facial expression, and also vocal aspects in the form of voice quality and rate of vocalization (Wirz 1981). However, it has also been recognized more recently that challenging behaviours are often functional (Carr *et al.* 1994). As a result of this, several researchers have proposed a 'communication hypothesis', stating that challenging behaviours often function as a form of communication (Carr *et al.* 1994). The present authors include some of these challenging behaviours within their definition of communication.

The present study examines the effects of four therapies on five measures of positive communication. It also examines the effects of these therapies on five negative forms of communication.

Subjects and methods

Participants

Eight adults with profound IDs participated in the present study. These were six women and two men (age range = 23–62 years) who were resident on the same ward in a hospital for individuals with IDs. They all exhibited challenging behaviours, including double incontinence, self-injury, aggression to others, self-stimulatory behaviour and screaming, and all had incapacitating mannerisms.

Design

A crossover design was used in which all participants were involved in all treatment conditions. Order effects were counterbalanced by each treatment condition having two participants who received it first, second, third and last.

Procedure

Each participant was involved in 20 consecutive sessions of each therapy procedure. The sessions lasted for 20 min and were followed by a period of engaging in an occupational task. Three sessions were conducted each week for each participant.

Therapy procedures

The sessions were carried out by trained individuals following standard appropriate procedures. If participants failed to cooperate in the session, they were encouraged to return to the procedure. However, if this failed, the therapists were instructed to abandon the session so as not to distress the participants.

In order to confirm appropriateness and therapeutic effectiveness, 12 sessions (three from each procedure) were randomly selected for rating by recognized experienced therapists in each technique. All sessions were rated 4 or 5 on a five-point scale from (1) not therapeutic to (5) exceptionally therapeutic and sensitive to the individual's needs.

Relaxation therapy

Behavioural relaxation training was used. This focuses on the therapist modelling relaxed and un-relaxed postures in 10 areas of the body and encouraging the participant to adopt the relaxed postures. This procedure was carried out in a secluded part of the ward and relaxing music was also played. Verbal and physical prompts were almost always necessary to help the participants adopt a relaxed position, especially in the early sessions.

Hand massage/aromatherapy

The essential oils of orange flower, lemongrass and lavender were mixed according to the guidelines in Stead (1986). The participants were then given a hand massage using these aromatherapy oils.

Active therapy

A bouncy castle was used in the active therapy condition. If the participant was unable to bounce unaided, the therapist her or himself could bounce which would, in turn, cause the participant to benefit from the physical sensations.

Snoezelen

A room with blacked-out windows was used for the Snoezelen condition. Visual effects included bubble tubes, optic fibres, coloured lights and a solar projector. Soft music was played in the background and an aroma board with several different smells could be activated at the touch of a button. There was also a tactile wall and mirrors to provide further stimulation.

Assessment of communication

Communication was measured using 10 dependent variables, which were scored using a five-point Likert scale. Five positive variables were measured: friendly vocalization, soft touch, non-threatening gaze, laughter and overall positive responsiveness. Five negative variables were also measured: screaming, self-injury, aggression to others, pulling away or leaving, and overall negative responsiveness. Measures for each variable were taken at baseline, and after five, 10, 15 and 20 sessions.

All sessions were rated by trained raters who were blind to the conditions of the present study. Forty per cent of ratings were conducted by two independent blind raters and agreement between raters was consistently over 85%. Inter-rater reliability was calculated using the number of agreed ratings divided by the number of agreements plus disagreements, expressed as a percentage. When disagreements of less than one scale point were combined, agreement between raters increased to over 95%.

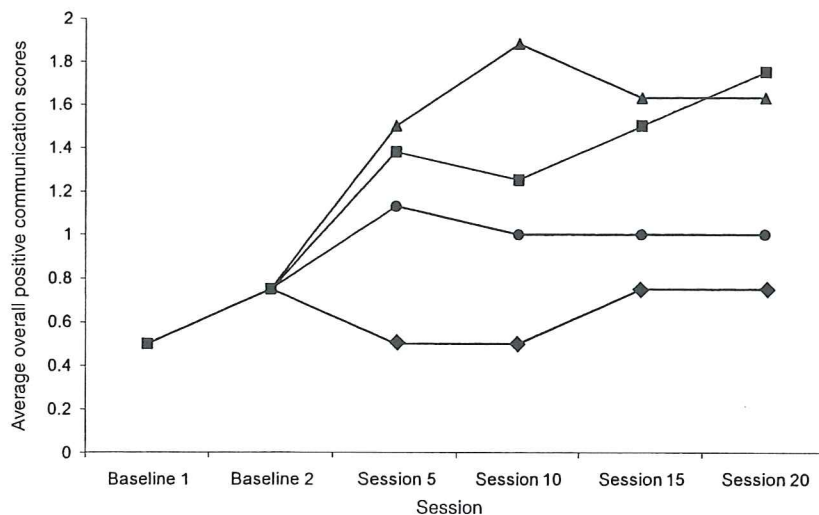


Figure 1 Ratings of the overall level of positive communication for each condition at each point of testing: (■) Snoezelen; (●) active therapy; (▲) relaxation; and (◆) hand massage.

Results

Analysis of overall level of positive communication

Figure 1 shows the mean scores for each therapy at each time of testing. A two-way analysis of variance (ANOVA) conducted on these scores found that there were significant main effects between therapy conditions ($F = 3.19$; $P < 0.05$; $d.f. = 3.21$) and across times of testing ($F = 4.14$; $P < 0.01$; $d.f. = 5.35$). There was also a significant interaction between therapy conditions and times of testing ($F = 2.19$; $P < 0.05$; $d.f. = 15.105$).

Since there was a significant interaction between the main effects, further one-way ANOVAs were conducted to determine the source of the variance. Table 1 is a summary of these results. As can be seen, there were significant effects within therapy conditions for Snoezelen and relaxation, and across times of testing for all 20 sessions.

Table 1 Summary of simple effects: overall positive

Source	Effect		Error		F-value	P-value
	Mean	d.f.	Mean	d.f.		
Within Snoezelen	1.79	5	0.35	35	5.12	0.001
Within active therapy	0.42	5	0.47	35	0.90	0.493
Within relaxation	2.44	5	0.32	35	7.54	0.000
Within hand massage	0.15	5	0.39	35	0.39	0.855
Between groups:						
5 sessions	1.58	3	0.75	21	2.11	0.129
10 sessions	2.61	3	0.97	21	2.69	0.072
15 sessions	1.36	3	0.51	21	2.69	0.072
20 sessions	1.86	3	0.51	21	3.67	0.028

Table 2 Scheffe comparisons between groups: overall positive

Session	Comparison
5	Relaxation > hand massage ($P < 0.05$)
10	Relaxation > hand massage ($P < 0.01$)
15	No significant differences
20	Snoezelen > hand massage ($P < 0.05$)

Since a significant result was found, Scheffe comparisons were conducted between therapies at each point in testing (Table 2). Significant differences can be seen between relaxation and hand massage at sessions 5 and 10, and also between Snoezelen and hand massage at session 20. There were no significant differences seen at session 15.

Identical analyses were conducted for the other four variables in positive communication. Two-way ANOVAS revealed a significant interaction in all variables, i.e. friendly vocalization, soft touch, non-threatening gaze and laughter. Further statistical analysis revealed a consistent therapeutic effect for Snoezelen and relaxation on all variables, and for hand massage on soft touch.

Analysis of overall level of negative communication

Figure 2 shows the mean scores for each therapy at each time of testing (it should be noted that a higher score indicates an increased amount of negative communication). A two-way ANOVA conducted on these scores found that there were significant main effects between therapy conditions ($F = 4.67$; $P < 0.05$; d.f. = 3.21) and across times of testing ($F = 3.75$; $P < 0.01$; d.f. = 5.35). There was also a significant interaction between therapy conditions and times of testing ($F = 2.74$; $P < 0.05$; d.f. = 15 105).

Since there was a significant interaction between the main effects, further one-way ANOVAS were conducted to determine the source of the variance. A summary of these results can be seen in Table 3. As can be seen, there were significant effects within therapy

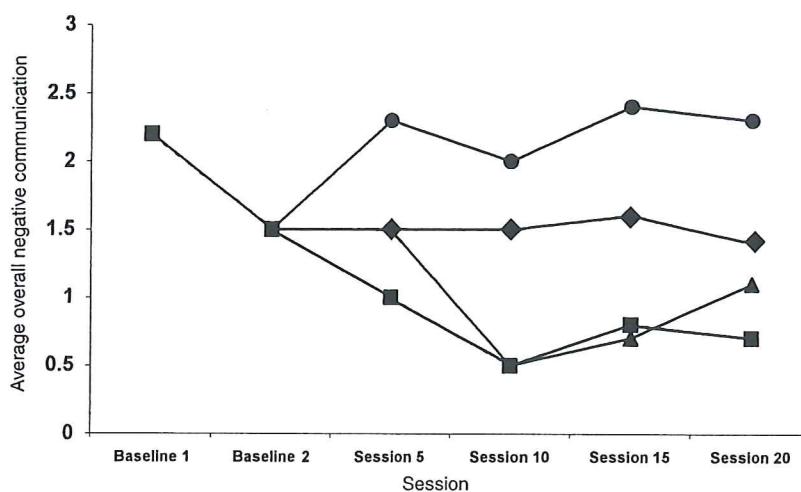


Figure 2 Ratings of the overall level of negative communication for each condition at each point of testing: (■) Snoezelen; (●) active therapy; (▲) relaxation; and (◆) hand massage.

Table 3 Summary of simple effects: overall negative

Source	Effect		Error		F-value	P-value
	Mean	d.f.	Mean	d.f.		
Within Snoezelen	2.97	5	0.47	35	6.37	0.000
Within active therapy	0.78	5	0.73	35	1.08	0.389
Within relaxation	2.57	5	0.49	35	5.30	0.001
Within hand massage	0.57	5	0.49	35	1.18	0.340
Between groups:						
5 sessions	2.13	3	1.01	21	2.11	0.129
10 sessions	4.50	3	0.67	21	6.75	0.002
15 sessions	4.13	3	1.17	21	3.52	0.033
20 sessions	3.70	3	1.08	21	3.43	0.036

Table 4 Scheffe comparisons between groups: overall negative

Session	Comparison
Baseline 1	No significant differences
Baseline 2	No significant differences
5	Active therapy > Snoezelen ($P < 0.05$)
10	Active therapy > Snoezelen + relaxation ($P < 0.025$)
15	Active therapy > Snoezelen + relaxation ($P < 0.025$)
20	Active therapy > Snoezelen ($P < 0.01$)

conditions for Snoezelen and relaxation, and across times of testing for sessions 10, 15 and 20.

Because of these apparent trends, Scheffe comparisons were conducted between therapies at each point of testing (Table 4). Significant differences can be seen between active therapy and Snoezelen at sessions 5, 10, 15 and 20, and between active therapy and relaxation at sessions 10 and 15.

Identical analyses were conducted for the other four variables in negative communication. The two-way ANOVAS only revealed a significant interaction on 'pulling away/attempts to leave'; the relaxation and Snoezelen conditions both obtained a reduction. Active therapy produced significantly greater amounts of 'pulling away' than relaxation and Snoezelen at sessions 10 and 15.

Discussion

The present results indicate that Snoezelen and relaxation significantly increase the overall level of positive communication and decrease the overall level of negative communication. These findings are further supported by the four specific measures of positive communication which all also show that Snoezelen and relaxation increase the level of positive communication, whereas active therapy and hand massage have minimal or no effect. The effect of the four therapies on the four measures of negative

communication is less pronounced except in the 'pulling away/attempting to leave' measure where Snoezelen and relaxation significantly decrease the level of this measure of negative communication.

In contrast to the findings of others, the present study shows that active therapy has neither a positive or negative effect on communication (Smith & Cook 1990). However, it has been recognized that the form of exercise used can have an influence on the outcomes (Lancioni & O'Reilly 1998), and therefore, another form of active therapy may have a different effect on the communication of individuals with severe and profound IDs.

Aromatherapy/hand massage has a limited effect on the communication of individuals with severe and profound IDs. Previous reports have indicated that some of the benefits of aromatherapy occur because of the absorption of the oils used (Balaiche 1978; Ryman 1984). However, these effects will not be immediate and may have been missed by the failure of the study to carry out a follow-up assessment. A follow-up assessment could also have been used to assess the generalization of the effects caused by Snoezelen and relaxation. This should be considered in future studies in this area.

Although little research has been carried out on the efficacy of Snoezelen, the present results support a growing body of research which indicates that it has the potential to have a positive effect in a number of areas, including concentration (Lindsay *et al.* 1997), relaxation (Martin *et al.* 1998) and maladaptive behaviour (King 1993; Withers & Ensum 1995; Shapiro *et al.* 1997). Snoezelen was initially intended as an activity, not a therapy (Hulsegge & Verheul 1987; Martin *et al.* 1998). However, the continually expanding body of research highlighting some of the therapeutic effects of Snoezelen indicates that this therapy should possibly be recognized for these therapeutic effects rather than just as a time-filling activity. It should be noted that Martin *et al.* (1998) found little beyond the immediate relaxation effects and the present study does not assess generalized effects.

Relaxation has already been shown to have a therapeutic effect in a number of studies (McPhail & Chamov 1989; Turk & Francis 1990; Williams 1990; Lindsay *et al.* 1994; Lindsay & Morrison 1996) and this trend appears to be confirmed in the present study in which it can be seen that relaxation increased positive communication. However, although both relaxation and Snoezelen appear to increase positive communication, the effect on decreasing negative communication/challenging behaviours was less marked.

It is of note that the two most beneficial approaches in the present study used music. There is a growing body of literature on the therapeutic use of music for people with IDs (Hooper & Lindsay 1992, 1997) and it may be that music is a more powerful confounding variable in the present study than was initially considered. Future research should consider partialing out music as a separate therapeutic variable in order to judge its individual benefits.

During the present study, the length and number of therapy sessions was kept constant to eliminate confounding variables; however, it is recognized that each participant may respond to a different length and/or a different number of therapy sessions. The requirements for a controlled trial in a study such as this compete to some extent with individual preferences of participants. There is no doubt that two of the individuals disliked active therapy and refused to do it. In a clinical treatment, it is highly unlikely that a therapist would have persisted for 20 sessions trying to introduce someone to something that they did not enjoy (NB these individuals were not forced to complete the session – it was simply abandoned when it was obvious they did not want to do it).

However, clinical results may be different when individual needs are taken into consideration. Most subjects responded at some level to relaxation and Snoezelen treatments.

It is important to observe that procedures have been introduced against rising and falling baselines for positive and negative communication, respectively. This gives rise to the hypothesis that there would have been continued change in the absence of any therapy. It is a major shortcoming of the present study that a no-treatment control condition was not included against which it might have been possible to assess spontaneous habituation/development over this number of sessions. Indeed, one interpretation of the findings is that certain procedures (e.g. aromatherapy and rebound) are anti-therapeutic in that they impede improvements over time which may result from simple repeated engagement and social interaction, whereas other procedures do not impede such improvement. Certainly, Martin *et al.* (1998) found little evidence of any effects beyond that of the social interaction involved.

The present study indicates a possible therapeutic role for Snoezelen and relaxation. However, these results should be interpreted with caution because of the problems indicated previously. However, this study does provide a basis for future research in this area.

Correspondence

Any correspondence should be directed to Professor Bill Lindsay, Clinical Psychology Department, Wedderburn House, 1 Edward Street, Dundee DD1 5NS, UK.

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