Generalisation of the Effects of Leisure Rehabilitation for Stroke Patients

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A randomised controlled trial was used to evaluate the effectiveness of a leisure rehabilitation programme on functional performance and mood. The subjects were randomly allocated to three groups: a leisure rehabilitation group, a conventional occupational therapy group and a control group. The subjects assigned to the leisure and conventional occupational therapy groups received individual treatment at home on discharge from hospital. Baseline assessments were carried out on admission to the study and at 3 and 6 months after discharge from hospital by an assessor who was 'blind' to group allocation. The subjects receiving leisure rehabilitation performed significantly better in mobility and psychological well-being than the subjects in the other two groups.

Introduction

Leisure can no longer be regarded as just a way of filling time. Previous studies have shown that satisfactory leisure is related to life satisfaction (Mancini, 1978; Allen and Beattie, 1984; Sneegas, 1986). Mancini (1978) found that subjects who were satisfied with their free time and who felt that their leisure activities met their needs reported more satisfaction with life in general.

It is well documented that leisure participation decreases after stroke (Sjogren, 1982; Feibel and Springer, 1982; Drummond, 1990). It is also known that a significant number of patients are depressed after stroke (Robinson and Price, 1982; Collin et al, 1987; Wade et al, 1987). Feibel and Springer (1982) have suggested that such depression can be related to the loss of social activities experienced by individuals following their stroke. This idea is supported to some extent by Wade et al (1987), who found that a low level of social activities was associated with depression. Lewinsohn et al (1978) and others (Young and Beck, 1982; Williams, 1984; Fennell, 1989) suggest that depression is characterised by a low level of pleasant activities. It is suggested, therefore, that one strategy to control depression is to increase the number and variety of pleasant activities carried out.

In an earlier paper (Drummond and Walker, 1995), the authors demonstrated that stroke patients who participated in a leisure rehabilitation programme had higher leisure scores than those who did not. The aim of the present study was to assess the effects of the leisure rehabilitation programme on functional performance, psychological wellbeing and mood.

Method

Subjects

During the study period (October 1990 to July 1992), all patients were randomly allocated to the Nottingham Stroke Unit as part of a trial evaluating the effectiveness of stroke units (Juby et al, 1996). Patients were considered for inclusion in the present study if they spoke English, had no severe comprehension problems, had no history of dementia, did not need to be transferred for further medical treatment, and had an address in the Nottingham District Health Authority. The patients who lived in a nursing home were excluded from the study because these institutions often provide leisure activities for residents and, therefore, intervention was inappropriate with these patients.

The patients who met the study criteria were randomly allocated to one of three groups.

G1, Leisure rehabilitation group: The patients in this group were seen by an occupational therapist for a minimum of 30 minutes a week for the first 3 months following discharge from hospital. Thereafter, they were seen for a minimum of 30 minutes a fortnight for the next 3 months. The leisure programme provided was different for each subject, but the advice and help offered fell into the following broad categories: treatment, such as practice of transfers needed for leisure pursuits; positioning; provision of equipment; advice on obtaining financial assistance and transport; liaison with specialist organisations; and providing physical assistance, such as referral to voluntary agencies.

G2, Conventional occupational therapy group: The patients in this group were seen by the same occupational therapist for the same amount of time as the subjects in G1. They received occupational therapy activities, such as transfers and dressing practice. If the subjects were virtually independent, the visits were check-ups and the subjects were questioned about progress and any existing problems. The treatment programme for each individual in G2 was different according to his or her abilities and problems. No help or advice was offered to encourage participation in leisure pursuits.

G3, Control group: This group had no additional input over that which the group members were receiving from hospital and social services.

Procedure

The subjects were assessed on admission to the Stroke Unit, and at 3 and 6 months after discharge from hospital. The discharge assessments were conducted by an independent assessor who was 'blind' to the group allocation.

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Among the assessments carried out on admission to the Stroke Unit, and before randomisation, were the Rivermead Motor Assessment, Gross Function section (RMF; Lincoln and Leadbitter, 1979), and the Rivermead ADL Scale, Self-Care section (RADL; Whiting and Lincoln, 1980), to assess functional performance. The Nottingham Health Profile (NHP; Hunt et al, 1986) was used to assess psychological wellbeing.

At 3 and 6 months after discharge from the Stroke Unit, the functional performance of the subjects was assessed using the Nottingham Extended ADL scale (EADL; Nouri and Lincoln, 1987). This was used instead of the RADL because, in the later stages of recovery, more difficult tasks such as home management needed to be assessed. The NHP was used to monitor psychological wellbeing and the Wakefield Depression Inventory (WDI; Snaith et al, 1971) to measure depression.

Analysis

Non-parametric statistics were used to analyse the results because the scales were ordinal. Comparisons between the three groups were made using chi-squared and Kruskal-Wallis one-way analysis of variance. Post hoc comparisons were used to determine where differences between the three groups lay.

Results

Subjects

There were 128 patients admitted to the Stroke Unit, City Hospital, Nottingham, during the study period. Sixty-three patients did not meet the entry criteria to the study and were excluded; the reasons for their exclusion may be found in Table 1.

Table 1. Reasons for exclusion from the leisure study

Reasons	Number of patients
Comprehension problems/aphasic	31
Medical transfer	12
Address in nursing home	10
Outside geographical area	4
Deceased	2
No consent/refused	2
Incorrect diagnosis	1
Speaks no English	1
TOTAL	63

Sixty-five patients met the study criteria and were therefore entered into the study; 21 were randomly allocated to the leisure treatment group, 21 to the conventional treatment group and 23 to the control group. The characteristics of the subjects have been described in detail elsewhere (Drummond and Walker, 1995). There were no significant differences between the groups in marital status (χ^2=9.61; df 6; p=0.14), side of hemiplegia (χ^2=2.34; df 4; p=0.67) or gender (χ^2=1.56; df 2; p=0.46). A Kruskal-Wallis test showed no differences between the groups in the time between stroke and initial assessment (H=1.74; p=0.42).

A significant difference in age was found between the groups (H=10.58; p<0.01). The mean ages of subjects in the three groups were as follows: G1, 58.95 years (SD 13.11); G2, 70.10 years (SD 6.69); and G3, 68.65 years (SD 9.95). A Mann-Whitney 'U' Test showed that there were significant differences between G1 and G2 (U=99.5; p<0.01) and between G1 and G3 (U=134.5; p=0.01), but not between G2 and G3 (U=218; p=0.58). The subjects in the leisure treatment group were significantly younger than the subjects in the other groups.

Of the 65 subjects entered into the study, three could not be assessed at 3 months. Two subjects withdrew because of deteriorating health, and one was excluded because she had moved into a nursing home permanently and therefore no longer met the study criteria. A further two subjects completed 3-month but not 6-month assessments: one of them died and the other had another stroke.

Comparison of treatment groups

Baseline assessments

Table 2 illustrates the mean, standard deviation and range of scores for assessments on admission to the Stroke Unit.

Table 2. Baseline assessments

Assessment	Groups			Comparison of three groups†
	G1 (n=21)	G2 (n=21)	G3 (n=23)	
RMF				
Mean	4.14	3.76	4.39	H = 1.38
SD	2.69	3.22	2.39	
Range	0–9	0–11	1–10	p = 0.50
RADL				
Mean	5.81	5.71	6.61	H = 1.66
SD	1.81	1.27	2.23	
Range	2–9	1–8	3–14	p = 0.44
NHP				
Energy				
Mean	43.39	56.61	45.36	H = 1.66
SD	41.42	30.71	36.78	
Range	0–100	0–100	0–100	p = 0.41
Emotions				
Mean	16.44	33.61	31.60	H = 4.79
SD	16.15	26.32	28.92	
Range	0–60	0–86	0–90	p = 0.09
Pain				
Mean	8.51	29.70	15.90	H = 6.75
SD	12.57	29.66	22.51	
Range	0–42	0–100	0–59	p = 0.03*
Isolation				
Mean	13.57	23.53	26.70	H = 2.65
SD	17.47	27.41	25.89	
Range	0–45	0–100	0–80	p = 0.27
Sleep				
Mean	31.56	43.49	43.99	H = 1.48
SD	27.89	31.80	38.53	
Range	0–100	0–100	0–100	p = 0.48
Mobility				
Mean	47.45	71.37	41.65	H = 5.33
SD	27.38	16.52	35.84	
Range	0–77	46–89	0–100	p = 0.07
Total				
Mean	29.48	39.62	30.88	H = 1.86
SD	24.91	18.38	25.62	
Range	0–66	25–74	5–79	p = 0.40

† Using Kruskal-Wallis one-way ANOVA.
* Significant at 5% level.

As reported previously (Drummond and Walker, 1995), no significant differences were found between the groups on baseline RMF (H=1.38; p=0.50) and RADL (H=1.66; p=0.44) assessments.

No significant differences were found between the groups either for the total NHP score or for the NHP domains, with the exception of pain (H=6.75; p=0.03). Post hoc comparisons confirmed that there was a significant difference between G1 and G2 (U=58; p=0.01) but not between G2 and G3 (U=93; p=0.07) or G1 and G3 (U=108; p=0.63). Thus, the subjects in G2 had higher perceived pain scores than the subjects in the other groups.

Outcome assessments

There were no significant differences between the number of visits by the occupational therapist made to the leisure group (G1) and the conventional treatment group (G2) (U=177.5; p=0.27). On the EADL, one subscale was significantly different between the three groups at 3 months (mobility) and two subscales were significantly different at 6 months (mobility and leisure). The results may be found in Table 3.

The significant differences for mobility at both 3 months and 6 months lay between G1 and G2 (3 months: U=102.5; p<0.01) (6 months: U=85; p<0.01) and between G1 and G3 (3 months: U=139.5; p=0.04) (6 months: U=113; p=0.02). The significant differences for leisure at 6 months lay between G1 and G2 (U=104; p<0.01) and between G1 and G3 (U=104; p<0.01).

The total NHP score was significantly different between the groups at 3 months (p=0.02). See Table 3. The significant differences lay between G1 and G2 (U=122; p=0.02) and between G1 and G3 (U=113.5; p<0.01). There was no significant difference between G2 and G3 (U=202; p=0.84). The total NHP at 6 months almost achieved a statistically significant difference between the groups (p=0.06).

In the separate domains of the NHP, there was a significant difference in energy at 3 months and mobility months and 6 months. The significant difference for energy was between G1 and G2 (U=123; p=0.02) and not between G1 and G3 (U=151.5; p=0.08) or G2 and G3 (U=184.5; p=0.49). The significant differences for mobility were between G1 and G2 (3 months: U=112.5; p<0.01) (6 months; U=88.5, p<0.01) and between G1 and G3 (3 months: U=116.5; p<0.01) (6 months: U=123; p=0.04). There were no significant differences between G2 and G3 (3 months: U=180.5; p=0.44) (6 months: U=159; p=0.27). These results show that the subjects in the leisure rehabilitation group perceived that they had more energy at the 3-month assessment and were more mobile than the other groups.

Table 3. Comparison of outcome on functional performance and psychological wellbeing

	3 months				6 months			
Outcome measure	**G1 (n=21)**	**G2 (n=20)**	**G3 (n=21)**	**Comparison of three groups†**	**G1 (n=20)**	**G2 (n=20)**	**G3 (n=20)**	**Comparison of three groups†**
EADL								
Mobility								
Mean	10.67	5.95	7.10	H = 8.37	12.30	6.75	8.25	H = 10.69
SD	5.21	4.33	5.31		4.49	5.18	5.56	
Range	1–18	0–13	0–16	p = 0.02*	3–18	0–17	0–18	p = <0.01*
Kitchen								
Mean	10.43	7.70	10.00	H = 3.41	12.40	9.35	12.00	H = 1.70
SD	4.18	5.44	5.24		5.73	7.73	6.87	
Range	3–15	1–15	1–15	p = 0.18	1–18	1–18	1–18	p = 0.43
Domestic								
Mean	4.81	4.55	4.14	H = 0.06	5.05	4.90	3.85	H = 0.29
SD	4.78	4.03	3.81		4.50	4.08	2.80	
Range	0–15	0–15	0–15	p = 0.97	0–15	0–15	0–10	p = 0.9
Leisure								
Mean	8.86	6.70	6.95	H = 3.88	10.20	7.00	6.80	H = 9.2
SD	3.99	2.70	2.56		3.25	3.18	3.85	
Range	3–18	2–11	2–13	p = 0.14	6–18	0–11	0–13	p = 0.01*
NHP††								
Energy								
Mean	40.69	67.80	61.37	H = 6.02	42.72	58.12	64.00	H = 3.56
SD	34.71	33.78	33.52		34.22	31.19	41.26	
Range	0–100	0–100	0–100	p = 0.05*	0–100	0–100	0–100	p = 0.17
Emotions								
Mean	21.19	32.50	33.39	H = 2.79	23.66	29.85	29.84	H = 0.97
SD	22.05	29.39	26.40		23.19	26.51	23.91	
Range	0–74	0–100	0–86	p = 0.25	0–74	0–86	0–79	p = 0.62
Pain								
Mean	17.02	27.33	21.18	H = 0.49	22.12	33.20	21.68	H = 1.22
SD	22.22	34.73	23.75		27.82	33.26	24.09	
Range	0–84	0–100	0–87	p = 0.78	0–100	0–100	0–100	p = 0.54*
Isolation								
Mean	17.92	28.68	25.00	H = 0.76	11.05	23.13	18.04	H = 1.05
SD	13.39	28.17	25.07		16.72	31.34	25.72	
Range	0–45	0–80	0–81	p = 0.68	0–45	0–23	0–84	p = 0.59
Sleep								
Mean	20.81	35.03	36.33	H = 4.72	18.87	38.11	30.38	H = 3.39
SD	24.93	35.55	27.94		19.36	33.21	33.97	
Range	0–87	0–100	0–100	p = 0.09	0–65	0–100	0–100	p = 0.18
Mobility								
Mean	26.83	43.36	48.65	H = 9.31	24.70	49.13	40.80	H = 9.81
SD	22.81	23.93	25.32		23.01	21.09	26.04	
Range	0–79	11–88	0–79	p = 0.01*	0–79	13–79	0–88	p = <0.01*
TNHP								
Mean	24.08	39.12	37.65	H = 8.41	23.85	38.59	35.40	H = 5.70
SD	16.18	20.55	15.55		15.67	20.91	18.68	
Range	2–64	6–71	8–65	p = 0.02*	1–51	9–76	5–78	p = 0.06

† Comparison using Kruskal-Wallis one-way ANOVA.
†† For the NHP, low scores are better.
* Significant at 5% level.

On the WDI, there were no significant differences between the groups at either 3 months (H=2.31; p=0.32) or at 6 months (H=3.78; p=0.15). However, it was noted (using the classification of depression suggested by Wade et al, 1987) that fewer patients in the leisure group were classified as 'definitely depressed' (see Table 4).

Table 4. Classification of depression in subjects at 3 months and 6 months

3 months	G1 (n=21)	G2 (n=20)	G3 (n=21)
Categories			
Not depressed	13	11	9
Possibly depressed	4	2	3
Definitely depressed	4	7	9
6 months	**G1 (n=20)**	**G2 (n=20)**	**G3 (n=20)**
Categories			
Not depressed	9	12	7
Possibly depressed	8	2	4
Definitely depressed	3	6	9

The pattern of results indicates that there was a significant difference between the scores of the leisure rehabilitation group and the other groups. However, because subjects in G1 (the treatment group) were younger, this may be a confounding variable – younger patients may do more leisure activities; consequently, the effect of age needed to be controlled. Analysis of variance (ANOVA) was conducted on outcome variables which showed significant differences between the groups and, for those values which remained significant, the effect of the removal of age on the results was studied (analysis of variance with a co-variate, ANCOVA).

On the EADL, the subscale mobility remained significantly different when the effect of age was removed at 6 months (ANCOVA $F_2 56=3.97$, p=0.02) but not at 3 months (ANCOVA $F_2 58=2.21$, p=0.12). Leisure remained significantly different at 6 months (ANCOVA $F_2 56=5.22$, p=0.01).

Only the domain energy on the NHP at 3 months was shown to be age-related (ANCOVA $F_2 59=2.56$, p=0.09). The results from mobility at both 3 and 6 months (3 months, ANCOVA $F_2 58=3.20$, p=0.05) (6 months ANCOVA $F_2 56=4.70$, p=0.01) and total NHP scores at 3 months (ANCOVA $F_2 58=3.36$, p=0.04) remained significantly different when the effect of age was removed.

Discussion

With the notable exception of age, all other subject demographic characteristics were distributed evenly among the three groups. As age was a possible confounding variable in leisure participation, statistical measures were used to control the influence of age on the results. This had little effect on the overall conclusions, suggesting that age was not as important a factor as might have been expected.

On measures of functional outcome, the differences between the groups in mobility and leisure support the results obtained in an earlier study (Drummond and Walker, 1995), except that in that study significant differences were found in leisure participation at both 3 and 6 months. This may be because the EADL is a less sensitive measure of leisure participation.

There was a significant difference in outcome on measures of mobility. This may reflect the content of the leisure rehabilitation programme; all the subjects in G1 were encouraged to get out of their house, even if they could only get to their front steps. It may be that others who did not do this had a poorer perception of how far they could walk. It could also be that the subjects who did manage to leave their house had more practice in walking and could actually walk better.

The significant difference in the total NHP score at 3 months, not at 6 months, suggests that leisure rehabilitation improved psychological wellbeing although the effect was reduced with time. Other results from the NHP are less easy to explain. One might not necessarily expect differences between the groups with regard to energy, emotional distress, pain or sleep but, for example, if people are more mobile they might be expected to be less socially isolated. However, these factors relate to the subjects' perceptions of their performance in these areas and not necessarily to their actual abilities. Thus, individuals may think that their walking is good but, if it is not, they would have difficulty in getting out to socialise. It is also possible that leisure activity does not necessarily mean that individuals socialise more. This idea is supported by Cowgill and Baulch (1962) who found that, in a study of 224 people over 60 years of age, half of the subjects carried out more than 50% of their leisure activities alone, and this explained some of their social isolation.

Although the WDI scores show no significant differences between the groups for levels of depression, there were fewer individuals classified as 'definitely depressed' in G1 at both assessments. This may suggest a trend whereby patients involved in leisure rehabilitation were less likely to become very depressed.

Jongbloed and Morgan (1991) recorded similar results in their study of leisure rehabilitation in that depression did not differ between a leisure and a control group. However, Jongbloed and Morgan used two groups: a group receiving 'occupational therapy intervention related to leisure activities' and a control group who were visited by an occupational therapist who discussed leisure. The control subjects were therefore exposed to ideas and discussion about leisure and this may have led them to resume leisure activities. This idea is supported by the fact that leisure activities increased in both groups during the study period in contrast to the findings of the present study.

It may be that 6 months after discharge is too early to assess for depressed mood. It may take longer for the effects of a reduction in hobbies and interests to become apparent. There is contradiction in the literature regarding the length and course of depression; it has been suggested that depression begins a few weeks after stroke (Feibel and Springer, 1982; Robinson and Price, 1982; Robinson et al, 1983) and that, untreated, will run a natural course of 7-8 months (Robinson et al, 1983). However, an earlier study by Robinson and Price (1982) suggested that the severity and prevalence of depression is greater 6 months to 2 years after stroke. Wade et al (1987), in a community study of stroke, found that 25% of subjects not depressed initially became so at 6 months to one year later. Consequently, it is difficult either to refute or to support this idea of 6 months being too early to evaluate the effects of depression in the present investigation.

The sample size was small and the study may not be powerful enough to detect small differences in outcome. However, it did detect some benefits of leisure rehabilitation which need further investigation. The leisure intervention may have been too late; subjects had been discharged from hospital and little mention had been made of resuming former interests or of finding new hobbies in hospital. The results of the study might have been different if leisure rehabilitation had been presented earlier as part of the overall rehabilitation package. Many studies have reported that patients have long periods when they have little to do as inpatients in rehabilitation centres and stroke units (Keith and Cowell, 1987; Tinson, 1989). Introducing patients to leisure activities would

be practical and might improve the long-term outcome. More research is needed in the area of leisure rehabilitation to identify the patients who would benefit from a leisure programme. It is also important to know if similar results could be obtained with reduced therapy contact.

Conclusion

The overall results suggest that leisure rehabilitation had a significant effect on mobility and psychological wellbeing, but did not influence mood.

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