Can occupational therapy intervention play a part in maintaining independence and quality of life in older people? A randomised controlled trial

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Abstract: The main objective of this study was to see if older people could maintain their quality of life and independence after their homes had been modified and they were using community services as recommended by an occupational therapist. There were 167 study participants aged 69 to 94 years from the Northern Sydney Area. After being assessed at home by an occupational therapist, 105 were randomly allocated to one of two groups, to either have or not have the occupational therapist's recommendations carried out. They were assessed again after six months. A third group did not require any intervention. This group was followed up by telephone and postal questionnaire at six months. The main outcome measures used were the Sickness Impact Profile, the Philadelphia Geriatric Center Morale Scale, the Life Satisfaction Index, assessment of Activities of Daily Living, the Health Assessment Questionnaire and change in residence. After six months there were no difference in outcomes among the three groups. Most study participants remained at a satisfactory level on each measure. Three people had died. One had moved to hostel care and one had moved to a nursing home. A further 14 from the group having no intervention had withdrawn from the study. A secondary objective of this study was to indicate the responsiveness of these outcome measures to change in the short term (over six months) in an elderly population. Twelve-month assessments are in progress and may indicate what to expect from these outcome measures in the medium term. (*Aust N Z J Public Health* 1996; 20: 574–8)

MANY older people have problems carrying out everyday activities because of disability. In Australia, 45 per cent of people aged 60 to 84 years, and 83 per cent of people aged over 84 years have some form of disability.[1] Impairment of activities of daily living compromises self-care and independent living and is an important predictor of long-term morbidity and mortality.[2,3] Older people with disability are more likely to use health services and require long-term care. This will be a challenge to health service providers, especially in the Northern Sydney Area where 14 per cent of the population were aged 65 years or more at the 1991 census and the proportion of older people is increasing.[4]

Geriatric assessment and provision of equipment and services have been shown in both hospital and community settings overseas to decrease morbidity and mortality and increase quality of life.[5–9] A recent

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study of elderly veterans living independently in California found that an in-home preventive assessment program maintained functional status among the intervention group while the controls experienced significant decline over 12 months.[10] To our knowledge, no randomised trial assessing paramedical and community health service interventions has been done with subjects identified by population screening in Australia.

This study focused on people aged 65 years and over living independently in the community. Most had reported problems with carrying out everyday activities. The study evaluated whether providing equipment, modifying the home environment and using appropriate community services would have an effect on quality of life and independence in the short term. This paper presents the findings at six-month follow-up.

Methods

The study population came from 753 respondents to a previous postal questionnaire on health and well-being. All respondents with self-reported moderate or severe impairment of activities of daily living (n = 69) and a random sample of respondents with mild (n = 102) or no impairment (n = 30) were approached to participate in this study. Of those with moderate or severe self-reported impairment, 49 (71 per cent) agreed to participate, while 118 (89 per cent) of those with mild or no impairment agreed to participate. Participants were aged 65 years and over and living independently. They had been originally identified in 1992 from electoral rolls covering the Northern Sydney Health Area.

An occupational therapist assessed 167 people in their homes and recommended community services, home modifications or equipment, including grab rails, toilet surrounds, shower stools, pick-up tongs, shoe horns and back cushions. Participants were not informed of the therapist's recommendations.

People for whom the occupational therapist had recommended assistance were randomly allocated by an independent research nurse to either:

- an intervention group, which had equipment provided or recommendations carried out or organised by the independent research nurse, or
- a control group which did not have the recommendations carried out.

Randomisation was balanced within age and disability based on Health Assessment Questionnaire score strata. A computer randomly generated a list of treatment codes for each stratum of age and disability. The occupational therapist was not involved in the randomisation or the intervention.

Intervention and control groups were assessed again by the occupational therapist in the home after six months. Participants were instructed not to discuss any intervention or equipment provided so that the therapist was blinded as far as possible to intervention status.

A third group was found at the baseline home assessment to not require any intervention. The members of this group were contacted by telephone and postal questionnaire after six months but did not receive a follow-up home visit.

Quality of life and ability to perform everyday activities were assessed at baseline and at six months. Outcome measures included the 136-item Sickness Impact Profile,[11] the 17-item Philadelphia Geriatric Center Morale Scale,[12] the 13-item Life Satisfaction Index[13] and linear rating scales for 'happiness in the last month' and 'quality of life in the last six months'.

The occupational therapist graded and timed the participants' ability to carry out activities of daily living for which simple interventions were available.[9] These activities included getting on and off the toilet, getting in and out of the bath or shower, picking objects up from the floor, getting shoes on and off, walking, turning taps on and off, filling a kettle and pouring tea and dialling a telephone number. Study participants also graded their own ability to carry out activities of daily living, using the modified Health Assessment Questionnaire.[14] The questionnaire covers hygiene, meals and eating, walking, dressing and grooming, reaching for objects, grip, getting out of bed or a chair and housework and shopping. Use of health services, change in residence (especially a change to hostel or nursing home accommodation) and other significant life events (for example, loss of spouse or close relative, going onto a pension, problems with family and friends or retirement) were also noted.

Information was analysed using SAS software version 6.04.[15] Mean outcome measures at baseline and mean change from baseline were calculated. Paired t tests were used to detect significant changes from baseline within each group. Two-sample t tests were used to detect significant changes from baseline between intervention and control groups. The natural history of changes in activities of daily living over time in the elderly is not well documented. For this evaluation an outcome was defined (prior to the analysis) as satisfactory if the measure had not deteriorated by 10 per cent from baseline. Relative risks and 95 per cent confidence intervals were calculated for outcomes. Results for the group that did not have any intervention are included for completeness; however, the main focus of the study is the comparison between intervention and control groups.

Results

Sociodemographic features at baseline for the 167 study participants appear in Table 1. There were 105 participants eligible for randomisation: 34 men and 71 women ranging in age from 69 to 94 years. Mean age was 81.6±5.8 years (mean±standard deviation) for the intervention group, 79.9±6.3 years for the control group, 80.7±5.8 years for the group without the intervention. Age, sex, marital status, type of residence and the proportion in each group having modifications or services recommended at baseline did not differ significantly. In the six months preceding the study, 16 per cent of the intervention group and 12 per cent of the control group had experienced a major life event ($P > 0.05$).

After the first six months, more of the intervention group (29 per cent) than the control group

Table 1: Sociodemographic features at baseline for elderly people who had an occupational therapy intervention, a control group having no intervention, and a group requiring no intervention

Sociodemographic features	Intervention n = 52		Control n = 53		No intervention n = 62	
	n	%	n	%	n	%
Age group (years)						
<76	11	21	19	36	11	18
76–85	29	56	23	43	38	61
>85	12	23	11	21	13	21
Sex						
Men	17	33	17	32	27	44
Women	35	67	36	68	35	57
Marital status						
Married	28	54	25	47	29	47
Widowed or divorced	22	42	21	40	32	52
Never married	2	4	7	13	1	2
Type of residence						
House or unit	47	90	48	91	55	89
Self-care unit	5	10	5	9	6	10
Hostel unit	0	0	0	0	1	2

(none) used pick-up tongs ($P = 0.0002$) and more had also seen their general practitioner at least once (100 per cent compared with 90 per cent, $P = 0.03$). There were no differences in the proportion who had seen a specialist, podiatrist or chiropodist, physiotherapist, community nurse or other community health worker. Nor was there any difference in the proportion who had been admitted to hospital, been to an outpatient clinic, received home care or meals-on-wheels. Overall, the frequency of these events was low.

By the end of six months, one of the intervention group (aged 84 years) and two of the control group (aged 89 and 92 years) had died. One of the control group (aged 91 years) had moved to hostel care. All others were available for follow-up. For the nonintervention group, 14 withdrew from the study, including one person admitted to a nursing home. This left 149 people in the study at six months.

There was no difference at the level of significance 0.01 between intervention and control groups at baseline (Table 2). Table 3 shows the mean change from baseline for each outcome within each group. For the study population as a whole, mean scores tended toward the normal end of the scale for all quality of life and functional outcomes. While there were some significant changes from baseline within groups there were no statistically significant differences between groups. For the intervention group, three of the five quality of life or psychosocial measures showed a trend towards improvement, while the three functional measures showed no change or a slight deterioration. In the control group, four of the five quality of life or psychosocial measures showed a trend towards improvement, while the three functional measures showed no change or a slight deterioration. However, the result for quality of life in the past six months in the control group may have been biased by a large number of missing values for this particular measure. Those in the nonintervention group were generally at the normal end of the scales and tended to improve between baseline and six months, as indicated by the Sickness Impact Profile and functional measures.

Times taken for activities of daily living was not helpful in differentiating between groups. Except for filling a kettle and making a cup of tea (for which the control group performed faster than the intervention group at six months, $P < 0.02$), there were no statistically significant differences between the two groups.

Table 4 shows the proportion of intervention and control groups maintaining satisfactory outcomes and the relative risk of the intervention group maintaining outcomes at a satisfactory level. The majority in each group showed satisfactory maintenance of their outcome scores after six months. However, there was no significant difference between intervention and control groups.

Discussion

This study judged the success of an occupational therapy intervention using measured outcomes: physical, psychological and social wellbeing, function and quality of life. Our results suggest that older people can maintain satisfactory outcomes in the short term. Indeed, some outcomes can improve. 'Happiness' was higher in the intervention group, while 'morale', 'life satisfaction' and 'quality of life' were higher in the control group. The nonintervention group showed significant improvement in the Health Assessment Questionnaire assessment. The Sickness Impact Profile did show a slight deterioration in both intervention and control groups. The intervention group could have seen themselves as having more difficulty because they had to have another visit and had been given extra equipment. After six months, the intervention group was doing no better than the control group. The short time frame and the reduced final sample size could in part explain this.

All three groups had an assessment from an occupational therapist and ongoing follow-up. Just telephone contact with older people can significantly reduce morbidity and mortality and improve quality of life.[16] Therefore, all three groups had received some form of intervention through ongoing contact with the therapist.

Significant contamination occurred in the control group. At baseline, there was no significant difference between the groups in terms of equipment and services recommended or in use. After six months, many of the control group had been using community services such as meals-on-wheels or home care. Many were using special equipment, such as shower stools, or had modified their homes. In fact, more of the control group than the intervention group had had grab rails installed in their homes. Even where the intervention group had modifications done, this was often in addition to modifications carried out

Table 2: Mean outcome measures at baseline for elderly people who had an occupational therapy intervention, a control group having no intervention, and a group requiring no intervention

Measure and range of possible scores	Intervention $n = 51$	Control $n = 50$	P[a]	No intervention $n = 48$
Sickness Impact Profile (0–100%)				
total	13	11	0.4	8
physical	15	13	0.4	8
psychological	9	7	0.3	7
Philadelphia Geriatric Center Morale Scale (0–17)	11	11	0.8	not assessed
Life Satisfaction Index (0–26)	14	15	0.6	17
Happiness in last month (0–10)	5.9	5.8	0.8	6.3
Quality of life in last 6 months (0–10)	6.1	5.0	0.04	6.2
Activities of Daily Living assessment(1–4)	1.3	1.3	0.6	not assessed
Health Assessment Questionnaire (0–3)	0.98	0.9	0.4	0.8

Notes: (a) For comparison of intervention and control groups.

Table 3: Mean change in scores from baseline for elderly people who had an occupational therapy intervention, a control group having no intervention, and a group requiring no intervention

Measure and range of possible scores	Intervention $n = 51$			Control $n = 50$			No intervention $n = 48$	
	Change	Missing	P	Change	Missing	P	Change	P
Sickness Impact Profile (0–100%)[a]		1			0			
total	1		0.3	0		0.8	−1	0.2
physical	2		0.2	1		0.3	−1	0.2
psychological	0		0.9	1		0.5	−1	0.5
Philadelphia Geriatric Center Morale Scale (0–17)[b]	1	1	0.2	1	0	0.05	not assessed	
Life Satisfaction Index (0–26)[b]	2	6	0.08	2	7	0.02	0	0.8
Happiness in last month (0–10)[b]	1	5	0.01	0.8	8	0.06	0.1	0.9
Quality of life in last 6 months (0–10)[b]	−1	3	0.9	1.9	20	<0.001	−0.4	0.4
Activities of Daily Living assessment(1–4)[a]	0.1	1	0.03	0.2	0	0.02	not assessed	
Health Assessment Questionnaire (0–3)[a]	0	3	0.96	0	6	0.95	−0.2	0.004

Notes: (a) Positive change means deterioration from baseline to 6 months. (b) Positive change means improvement from baseline to 6 months.

Table 4: Comparison of intervention and control groups: percentages of elderly people in each group who maintained outcomes at a satisfactory level

Measure	Intervention $n = 51$		Control $n = 50$		Relative risk	CI
	%	CI[a]	%	CI		
Total Sickness Impact Profile	50	37 to 65	60	45 to 74	0.8	0.7 to 1.3
Philadelphia Geriatric Center Morale Scale	62	48 to 76	80	66 to 90	0.8	0.9 to 1.2
Life Satisfaction Index	64	50 to 78	72	58 to 84	0.9	0.7 to 1.3
Happiness in last month	74	60 to 86	70	55 to 82	1.1	0.8 to 1.3
Quality of life in last 6 months	54	40 to 69	82	69 to 91	0.7	0.6 to 1.2
Activities of Daily Living assessment	70	56 to 83	70	55 to 82	1.0	0.8 to 1.3
Health Assessment Questionnaire	65	50 to 78	76	62 to 87	0.9	0.7 to 1.2

Note: (a) CI = 95% confidence interval

previously. For some, the intervention consisted merely of an additional visit and one or two simple items, such as pick-up tongs. The intervention group therefore may not have received much additional benefit from the study intervention.

Measuring valid outcomes depends on what measures are used and who does the measuring. While most of the outcome measures used in the study have been well validated, some characteristics of these measures have not been: for example, 'responsiveness to change'.[17] Outcome scores and changes in scores have not been well interpreted for clinicians. The natural history of these scores has not been described. This study sheds some light on what to expect from these particular outcome measures in the Australian elderly population currently living independently.

Clinicians and patients often disagree when measuring quality of life.[18] In this study, participants graded their own ability (using the Health Assessment Questionnaire) as better than the occupational therapist's assessment (of activities of daily living). The time it takes to perform an activity has been suggested as a more sensitive indicator of ability than a clinician's grading of an activity.[9,19] In our study, the times taken for activities of daily living did not deteriorate, supporting the participants' own assessment of ability. Does it really matter if a person takes two seconds longer to get out of a bath, as long as they get out of the bath safely?

From the six-month results of this study, acting on advice of an occupational therapist does not appear to improve outcomes in a population that already uses occupational therapy aids at a high level. The participants in this study were a special group who might not have been representative of all older people living independently. They come from the Northern Sydney Area, an affluent area with low all-causes standardised mortality ratios. These factors would contribute to better baseline scores for quality of life and other general health measures. Services are available and participants were motivated to seek out and use these services regardless of which study group they were in. The average age of participants was 81 years. Most reported problems with carrying out everyday activities. All had been respondents to two earlier questionnaires, the first of which had a low response rate. Thus, participants in this study were interested in their own health and in doing something to improve their health. In less motivated people, satisfactory outcomes may not have occurred. In less advantaged areas where there was less access to or knowledge of services, the intervention may have had a more significant effect, even in the short term. This study provides useful information about measuring outcomes in a local elderly population. The results challenge the stereotype of older people as dependent and destined for institutionalised care.

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