

The extent and breadth of benefits from participating in chronic disease self-management courses: A national patient-reported outcomes survey

Sandra Nolte^{a,b}, Gerald R. Elsworth^b, Andrew J. Sinclair^c, Richard H. Osborne^{a,*}

^a *AFV Centre for Rheumatic Diseases, Department of Medicine, Royal Melbourne Hospital, The University of Melbourne, Parkville, Vic. 3050, Australia*

^b *CIRCLE (Collaborative Institute for Research, Consulting and Learning in Evaluation), RMIT University, Melbourne, Vic. 3000, Australia*

^c *School of Exercise and Nutrition Sciences, Deakin University, Burwood, Vic. 3125, Australia*

Received 19 May 2006; received in revised form 30 August 2006; accepted 30 August 2006

Abstract

Objective: To quantify the benefits that people receive from participating in self-management courses and identify subgroups that benefit most.

Methods: People with a wide range of chronic conditions attending self-management courses ($N = 1341$ individuals) were administered the Health Education Impact Questionnaire (heiQ). Baseline and follow-up data were collected resulting in 842 complete responses. Outcomes were categorized as substantial improvement (effect size, $ES \geq 0.5$), minimal/no change ($ES -0.49$ to 0.49) and substantial decline ($ES \leq -0.5$).

Results: On average, one third of participants reported substantial benefits at the end of a course and this ranged from 49% in the heiQ subscale Skill and technique acquisition to 27% in the heiQ subscale Health service navigation. Stratification by gender, age and education showed that younger participants were more likely to benefit, particularly young women. No further subgroup differences were observed.

Conclusion: While the well-being of people with chronic diseases tends to decline, about one third of participants from a wide range of backgrounds show substantial improvements in a range of skills that enable them to self-manage.

Practice implications: These data support the application of self-management courses indicating that they are a useful adjunct to usual care for a modest proportion of attendees.

© 2006 Elsevier Ireland Ltd. All rights reserved.

Keywords: Patient education; Self-management; Chronic diseases; National survey; Program evaluation

1. Introduction

Chronic diseases are an increasing burden for health care systems worldwide. The World Health Organization ascribes about 60% of global deaths and close to 50% of disability to chronic diseases [1]. It has become imperative to reduce this burden at the individual and societal levels as projections indicate that national health systems, in their current form, will not be able to cope [2]. One approach to

reduce the burden associated with chronic conditions is the provision of group-based education and the active engagement of patients in their own care. Hence self-management courses have been developed to empower participants, increase their confidence, teach them skills and techniques and improve their interaction with the health care system to enable them to improve the management of their chronic condition [3].

In Australia, several formal courses for chronic disease self-management are offered through both government and non-government agencies. Such courses usually run 2–2.5 h per week over a 4–10 week period and are delivered in a

* Corresponding author. Tel.: +61 3 8344 3148; fax: +61 3 9342 7632.
E-mail address: richardo@unimelb.edu.au (R.H. Osborne).

group setting (8–15 participants). They are facilitated by lay leaders and/or health professionals who often use psycho-educational approaches to facilitate problem-solving, goal-setting, decision-making and individual action plans [3–6].

A rapid growth in application of self-management courses has occurred in recent years. The UK National Health Service has implemented the Expert Patient Programme [7], a lay-led self-management intervention, as part of health care reform and about 31,000 patients have undertaken the program [8]. In the USA the chronic disease self-management program has been implemented within a large health care organisation [9]. Using a different approach, the Australian Commonwealth Department of Health and Ageing implemented the Sharing Health Care Initiative, which involved several large demonstration projects across a variety of settings [10].

As self-management courses are now being applied in a variety of settings and implemented at the government policy level, there is an urgent need to understand and document the impact of self-management courses across settings. Numerous controlled trials have been conducted across disease groups and have been summarised in meta-analytic and narrative reviews [3,11,12]. These studies, however, suggest that self-management courses might not be suitable for all types of chronic conditions and population subgroups.

In this paper, we investigate impacts of self-management courses undertaken across settings and demographic groups in Australia. Specifically, we set out to identify if gender, age and educational background are associated with lesser or greater benefits.

2. Methods

2.1. Courses and participants

From August 2004 to September 2005 a total of 142 self-management courses were evaluated. The types of courses included 94 chronic disease [13], 22 arthritis [14], 10 osteoporosis [6] and 16 other self-management courses. These were fibromyalgia, pulmonary/heart failure rehabilitation, pain and stress management courses.

For recruitment, all major providers of self-management courses across Australia were identified and contacted (including non-government organisations such as the Arthritis Foundation, Diabetes Australia, etc., Community Health Centres and hospitals) and “snowball” recruitment techniques were then used. The sampling was therefore “convenience” and while it was not possible to ascertain the total number of self-management courses, it is likely that the majority of courses run across all states in Australia were recruited into the study.

Once a course was registered with the Centre for Rheumatic Diseases, course leaders were sent baseline and follow-up Health Education Impact Questionnaires (heiQ) as well as a questionnaire to collect information about

courses and participant attendance. Participants were administered questionnaires before the start of the self-management course (baseline) and at the end of the last session (follow-up), which was generally 4–10 weeks later. Participation in the study was voluntary with no active follow-up. To ensure participants’ confidentiality they were provided with a sealable envelope before returning the follow-up heiQ to the course leaders who then posted the questionnaires to the researchers. A course report was provided to the course leaders and their respective organisation as the only inducement for participation in the study.

2.2. Health Education Impact Questionnaire (heiQ)

The heiQ is a generic eight scale questionnaire specifically designed to measure outcomes of health education courses for chronic disease self-management [15]. Scale construction was through a wide range of stakeholder consultations (from patients, health professionals to policy makers) including the development of a program logic model [16,17]. Relevant stakeholders were further involved in concept mapping exercises and interviews to identify specific item content and underlying constructs. The heiQ consists of 42 items, of which four to seven items describe one of the following eight scales [15]:

- (1) *Positive and active engagement in life.* Getting engaged in life, intent for actions, indicators of now being engaged and involved in life.
- (2) *Health-directed behaviour.* Healthy behaviours including prevention, exercise, relaxation.
- (3) *Skill and technique acquisition.* Symptom relief skills, skills and techniques to manage own health.
- (4) *Constructive attitudes and approaches.* Minimising the illness—“I am not going to let this disease control my life”.
- (5) *Self-monitoring and insight.* Self-monitoring of (sub-) clinical indicators, self-management, setting reasonable limits or targets, insight into living with a health problem.
- (6) *Health service navigation.* Communication, relationships with health care professionals, interaction and negotiation with the health care system including the confidence to talk with health care professionals, the understanding of ways to access health care to get needs met.
- (7) *Social integration and support.* Social interaction, feelings of social isolation as a result of the illness, “kinship” in group leading to sense of support, seeking support from others.
- (8) *Emotional well-being.* Overall health-related negative affect; attitude to life; anxiety, stress, anger and depression.

Respondents were asked to rate items on a six-point Likert scale, ranging from “strongly disagree” to “strongly

agree". One scale (Emotional well-being) is a reversed scale. In ascending order the reliability of each heiQ subscale is as follows: 0.70 Self-monitoring and insight, 0.80 Health-directed behaviour, 0.81 Skill and technique acquisition, 0.81 Constructive attitudes and approaches, 0.82 Health service navigation, 0.86 Positive and active engagement in life, 0.86 Social integration and support and 0.89 Emotional well-being. Further information on the psychometrics is available elsewhere (see <http://www.crd.u-nimelb.edu.au/>) [15].

2.3. Statistical analysis

Some of the participants of the self-management courses provided baseline data only. Therefore we applied descriptive and univariate χ^2 analyses to explore whether differences in characteristics existed between those with baseline data only and those with complete data (baseline and follow-up). The data were moderately skewed in most heiQ scales and five heiQ scales showed significant homogeneity of variances hence the data violated some assumptions for parametric tests. We therefore applied analysis of variance (ANOVA) with the Brown-Forsythe robust option for all mean comparisons. This robust option does not assume variances to be homogeneous [18]. The non-parametric Kruskal–Wallis test was also applied. ANOVA (Brown-Forsythe) and Kruskal–Wallis were applied to explore baseline differences between those participants with incomplete and those with complete data. For subgroup analyses we again explored baseline differences stratifying the sample by age, gender and level of education.

The impact of self-management courses on the participants was represented by three categories of change derived from baseline and follow-up course assessments: substantial improvement (effect size, $ES \geq 0.5$), minimal/no change ($ES -0.49$ to 0.49) and substantial decline ($ES \leq -0.5$). The within-person individual ES was defined as the individual change score divided by the standard deviation of the baseline score of the sample [19]. The distribution-based cut-off of 0.5 ES was chosen as a standardised cut-off and approximates a minimal important difference (MID) derived from several methodologies [19–22]. For the heiQ scales, a threshold of 0.5 ES on the six-point Likert scale means that participants had to indicate at least three state changes in each heiQ scale (apart from the Emotional well-being scale requiring four state changes because of a higher number of items and a relatively high standard deviation) to be classified as having benefited substantially. One state change is defined as the minimum change people can indicate on a scale [23]. To explore whether differences existed between the number of participants who overcame the threshold of 0.5 ES per described subgroup after having attended a self-management course, descriptive and univariate χ^2 analyses were applied.

For all analyses SPSS Version 14 was used.

Table 1

Demographic characteristics of participants and comparison of those who provided heiQ baseline data only vs. those who provided complete data (baseline and follow-up)*

Subgroups	Total <i>n</i> = 1169		Baseline only <i>n</i> = 327		Complete data <i>n</i> = 842	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Age group						
<50 years	207	17.9	66	20.6	141	16.9
50–59	231	20.0	65	20.2	166	19.9
60–69	312	27.0	75	23.4	237	28.3
70 and above	407	35.2	115	35.8	292	34.9
Gender						
Female	871	75.2	248	77.0	623	74.4
Male	288	24.8	74	23.0	214	25.6
Education						
Primary education	136	12.7	38	12.7	98	12.8
Up to year 8	296	27.7	80	26.7	216	28.1
Year 9–12	281	26.3	83	27.7	198	25.8
TAFE	196	18.4	54	18.0	142	18.5
University	159	14.9	45	15.0	114	14.8

* No differences were observed between groups ($p > 0.05$ for χ^2 tests).

3. Results

3.1. Demographics

In total, 1341 individuals were identified in 142 courses. One thousand one hundred and sixty-nine participants entered the study. Of these, 842 (72%) individuals provided follow-up data.

Of the 1169 participants, 75% were female and the median age was 64 years (range from 18 to 92). Thirteen percent of participants had primary school or less education and about 15% had a university degree. Two thirds of participants reported they had at least one (31%) or two or more (36%) comorbidities apart from their main health problem. Most frequently reported diseases were osteoarthritis (46%), depression (28%), asthma (20%), osteoporosis (19%), diabetes (19%), rheumatoid arthritis (17%) and coronary heart disease (15%). Age, gender and educational levels did not differ between participants who provided baseline data only compared with those who provided both baseline and follow-up data (Table 1).

3.2. Baseline scores

The mean (S.D.) baseline scores per heiQ scale ranged from 3.33 (1.21) in Emotional well-being to 4.73 (0.65) in Self-monitoring and insight. Baseline scores of participants who provided baseline data only and those for whom we received both baseline and follow-up data differed significantly in seven of the eight heiQ scales with the latter group reporting higher baseline scores than those who did not provide follow-up data (Table 2). Equivalent results were obtained with the Kruskal–Wallis test.

Table 2

Mean baseline heiQ scores of people entering the self-management programs and comparison of starting values of those who provided baseline data only vs. those who provided complete data (baseline and follow-up)

heiQ scales	Total <i>n</i> = 1169		Baseline only <i>n</i> = 327		Complete data <i>n</i> = 842	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Positive and active engagement in life	4.47	(0.99)	4.33*	(1.07)	4.52	(0.95)
2. Health-directed behaviour	4.31	(1.21)	4.14*	(1.25)	4.37	(1.19)
3. Skill and technique acquisition	4.14	(0.92)	3.98*	(0.98)	4.20	(0.88)
4. Constructive attitudes and approaches	4.55	(0.95)	4.39*	(1.02)	4.61	(0.92)
5. Self-monitoring and insight	4.73	(0.65)	4.66*	(0.70)	4.75	(0.63)
6. Health service navigation	4.69	(0.88)	4.56*	(0.98)	4.74	(0.84)
7. Social integration and support	4.13	(1.20)	3.98*	(1.28)	4.18	(1.17)
8. Emotional well-being	3.33	(1.21)	3.27	(1.20)	3.35	(1.21)

* Differences between “baseline only” and “complete data” significant at the $p < 0.05$ level for Robust ANOVA Brown-Forsythe.

3.2.1. Age

In all heiQ scales participants 49 years and younger reported significantly lower baseline scores (range 2.77 (1.05) in Emotional well-being to 4.50 (0.73) in Self-monitoring and insight) than participants between 50 and 59 years (range 3.09 (1.21) in Emotional well-being to 4.68 (0.71) in Self-monitoring and insight), 60 and 69 years (range 3.39 (1.18) in Emotional well-being to 4.82 (0.55) in Self-monitoring and insight) and 70 years and above (range 3.72 (1.18) in Emotional well-being to 4.87 (0.75) in Health service navigation, Table 3). The Kruskal–Wallis test confirmed these results.

3.2.2. Gender

Baseline gender differences were observed in three heiQ scales. Women were found to report higher baseline scores than men in Positive and active engagement in life (4.51 (0.96) for women versus 4.36 (1.02) for men). Men reported higher scores than women in Health service navigation and Social integration and support (4.66 (0.89) versus 4.78 (0.85) and 4.06 (1.22) versus 4.32 (1.13), respectively, Table 3). Results were equivalent when applying the Kruskal–Wallis test.

3.2.3. Education

Participants with the lowest education had higher Health service navigation and Social integration and support scores at baseline when compared with people with higher levels of education (in education ascending order 4.87 (0.84), 4.75 (0.84), 4.72 (0.86), 4.55 (1.00), 4.60 (0.81) for Health service navigation and 4.40 (1.16), 4.19 (1.25), 4.10 (1.19), 3.95 (1.25), 4.05 (1.11) for Social integration and support, respectively). In contrast participants with higher education tended to report higher Emotional well-being baseline scores than participants with less education (3.15 (1.21), 3.34 (1.18), 3.36 (1.17), 3.26 (1.20), 3.60 (1.34), Table 3). The Kruskal–Wallis test showed identical results.

3.3. Improvement and decline from baseline

Overall, about one third of participants were found to have a substantial improvement (i.e. an improvement of 0.5

ES or greater) from baseline to follow-up. Across scales the largest proportion of people who improved was observed in Skill and technique acquisition (49%) and Self-monitoring and insight (41%). The scales where the smallest proportion of participants reported substantial benefits were Constructive attitudes and approaches, Social integration and support (each 32%) and Health service navigation (27%). Decline ranged from 7% in Skill and technique acquisition to 12% in Social integration and support and 15% in Emotional well-being (Table 4).

When the impact of the self-management courses was stratified by age, gender and education, some subgroups were found to have larger benefits than others.

3.3.1. Age

In seven heiQ scales more younger participants showed improvements compared with older participants. In six, there was a clear monotonic decline in the proportion of participants with increasing age. The largest difference between age groups was observed in Skill and technique acquisition. Other large age differences were observed in Self-monitoring and insight and Social integration and support (Table 4).

3.3.2. Gender

Only few differences between women and men were observed. Significantly more women showed a substantial improvement in Social integration and support (Table 4).

3.3.3. Age and gender

Age group analyses had shown that fewer older participants tended to improve. While a relatively high percentage of male participants (49%) were 70 years and older and small gender differences had been observed as well, further analyses were undertaken to identify whether age effects were associated with gender. We found that observed age effects were mainly apparent in women in five of the eight heiQ scales with a monotonic decline from youngest to oldest. The largest differences between the youngest and the older categories were observed in Self-monitoring and insight (57%, 46%, 41%, 33%; $\chi^2(6) = 19.4$, $p = 0.004$), Skill and technique acquisition (62%, 54%, 49%,

Table 3
Baseline ($n = 1169$) heiQ scores per subgroup age, gender, education

	N	%	Positive and active engagement in life		Health-directed behaviour		Skill and technique acquisition		Constructive attitudes and approaches		Self-monitoring and insight		Health service navigation		Social integration and support		Emotional well-being	
			Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Total			4.47	(0.99)	4.31	(1.21)	4.14	(0.92)	4.55	(0.95)	4.73	(0.65)	4.69	(0.88)	4.13	(1.20)	3.33	(1.21)
Age group																		
<50 years	207	17.9	3.99*	(1.08)	3.84*	(1.32)	3.75*	(0.95)	4.00*	(1.05)	4.50*	(0.73)	4.30*	(1.04)	3.56*	(1.28)	2.77*	(1.05)
50–59	231	20.0	4.44	(1.02)	4.28	(1.24)	4.13	(0.97)	4.42	(1.02)	4.68	(0.71)	4.58	(0.91)	3.97	(1.21)	3.09	(1.21)
60–69	312	27.0	4.64	(0.87)	4.56	(1.09)	4.23	(0.88)	4.73	(0.84)	4.82	(0.55)	4.80	(0.80)	4.24	(1.15)	3.39	(1.18)
70 and above	407	35.2	4.62	(0.89)	4.37	(1.14)	4.29	(0.85)	4.78	(0.79)	4.80	(0.60)	4.87	(0.75)	4.42	(1.08)	3.72	(1.18)
Gender																		
Female	871	75.2	4.51*	(0.96)	4.27	(1.21)	4.13	(0.92)	4.58	(0.95)	4.72	(0.65)	4.66*	(0.89)	4.06*	(1.22)	3.32	(1.21)
Male	288	24.8	4.36	(1.02)	4.42	(1.17)	4.20	(0.91)	4.47	(0.98)	4.74	(0.65)	4.78	(0.85)	4.32	(1.13)	3.34	(1.21)
Education																		
Primary education	136	12.7	4.61	(0.78)	4.46	(1.16)	4.25	(0.90)	4.70	(0.77)	4.81	(0.64)	4.87*	(0.84)	4.40*	(1.16)	3.15*	(1.21)
Up to year 8	296	27.7	4.43	(1.02)	4.34	(1.11)	4.17	(0.89)	4.57	(0.97)	4.76	(0.60)	4.75	(0.84)	4.19	(1.25)	3.34	(1.18)
Year 9–12	281	26.3	4.48	(1.01)	4.42	(1.19)	4.15	(0.92)	4.56	(0.96)	4.78	(0.61)	4.72	(0.86)	4.10	(1.19)	3.36	(1.17)
TAFE	196	18.4	4.44	(0.97)	4.21	(1.26)	4.06	(1.00)	4.45	(1.03)	4.67	(0.72)	4.55	(1.00)	3.95	(1.25)	3.26	(1.20)
University	159	14.9	4.56	(1.00)	4.14	(1.35)	4.09	(0.94)	4.62	(0.92)	4.64	(0.71)	4.60	(0.81)	4.05	(1.11)	3.60	(1.34)

* Significant at the $p < 0.05$ level for Robust ANOVA Brown-Forsythe.

Table 4
Proportion of participants ($n = 842$) with substantial improvement, no change or substantial decline stratified by age, gender, education

	Positive and active engagement in life		Health-directed behaviour		Skill and technique acquisition		Constructive attitudes and approaches		Self-monitoring and insight		Health service navigation		Social integration and support		Emotional well-being	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Substantial improvement	309	36.9	287	34.6	404	48.9	266	32.2	338	40.7	223	27.0	267	32.2	277	33.7
No change	451	53.9	461	55.5	365	44.1	476	57.6	399	48.1	514	62.3	463	55.8	424	51.6
Substantial decline	77	9.2	82	9.9	58	7.0	84	10.2	93	11.2	88	10.7	100	12.0	120	14.6
Age group																
Substantial improvement																
<50 years	62	44.0*	50	35.7	85	60.7*	53	38.1*	74	52.5*	52	37.1*	58	41.1*	58	41.4*
50–59	75	45.2	69	42.1	93	56.7	62	37.6	76	46.1	47	28.7	63	38.0	55	33.5
60–69	80	34.2	75	32.1	108	46.6	75	32.5	88	37.9	58	25.2	74	32.0	84	36.5
70 and above	89	30.7	92	32.2	115	40.4	72	25.3	97	33.9	64	22.5	69	24.0	79	28.1
No change																
<50 years	71	50.4	78	55.7	51	36.4	76	54.7	54	38.3	68	48.6	73	51.8	74	52.9
50–59	77	46.4	81	49.4	59	36.0	84	50.9	67	40.6	105	64.0	83	50.0	83	50.6
60–69	131	56.0	135	57.7	101	43.5	129	55.8	119	51.3	147	63.9	123	53.2	110	47.8
70 and above	170	58.6	162	56.6	151	53.0	185	64.9	156	54.5	190	66.7	182	63.4	153	54.4
Substantial decline																
<50 years	8	5.7	12	8.6	4	2.9	10	7.2	13	9.2	20	14.3	10	7.1	8	5.7
50–59	14	8.4	14	8.5	12	7.3	19	11.5	22	13.3	12	7.3	20	12.0	26	15.9
60–69	23	9.8	24	10.3	23	9.9	27	11.7	25	10.8	25	10.9	34	14.7	36	15.7
70 and above	31	10.7	32	11.2	19	6.7	28	9.8	33	11.5	31	10.9	36	12.5	49	17.4
Gender																
Substantial improvement																
Female	222	35.9	217	35.3	306	50.1	200	32.7	263	42.8	169	27.7	212	34.6*	208	34.3
Male	85	39.9	69	32.7	96	45.5	63	30.0	73	34.8	53	25.4	53	24.9	68	32.4
No change																
Female	342	55.3	341	55.5	267	43.7	346	56.6	284	46.2	379	62.0	327	53.3	315	52.0
Male	107	50.2	116	55.0	95	45.0	128	61.0	112	53.3	131	62.7	134	62.9	106	50.5
Substantial decline																
Female	55	8.9	56	9.1	38	6.2	65	10.6	68	11.1	63	10.3	74	12.1	83	13.7
Male	21	9.9	26	12.3	20	9.5	19	9.0	25	11.9	25	12.0	26	12.2	36	17.1
Education																
Substantial improvement																
Primary education	41	42.3	31	32.3	41	42.7	30	31.6	33	35.1	17	18.1	22	22.4	36	38.7
Up to year 8	85	39.7	77	36.3	98	46.9	56	26.3	80	37.6	61	28.6	68	32.2	70	33.2
Year 9–12	69	34.8	60	30.8	95	48.2	61	31.4	80	40.6	51	26.3	65	33.2	65	33.7
TAFE	52	36.9	60	42.6	78	55.3	50	35.7	62	44.0	49	35.0	48	34.0	50	35.7
University	38	33.3	34	30.1	60	54.1	40	35.7	51	45.5	27	24.1	33	29.2	30	26.8
No change																
Primary education	47	48.5	56	58.3	45	46.9	51	53.7	51	54.3	65	69.1	63	64.3	47	50.5
Up to year 8	108	50.5	112	52.8	94	45.0	134	62.9	101	47.4	132	62.0	118	55.9	107	50.7
Year 9–12	112	56.6	112	57.4	87	44.2	112	57.7	96	48.7	122	62.9	107	54.6	100	51.8
TAFE	74	52.5	73	51.8	55	39.0	81	57.9	67	47.5	72	51.4	77	54.6	68	48.6
University	68	59.6	68	60.2	47	42.3	58	51.8	48	42.9	76	67.9	66	58.4	70	62.5
Substantial decline																
Primary education	9	9.3	9	9.4	10	10.4	14	14.7	10	10.6	12	12.8	13	13.3	10	10.8
Up to year 8	21	9.8	23	10.8	17	8.1	23	10.8	32	15.0	20	9.4	25	11.8	34	16.1
Year 9–12	17	8.6	23	11.8	15	7.6	21	10.8	21	10.7	21	10.8	24	12.2	28	14.5
TAFE	15	10.6	8	5.7	8	5.7	9	6.4	12	8.5	19	13.6	16	11.3	22	15.7
University	8	7.0	11	9.7	4	3.6	14	12.5	13	11.6	9	8.0	14	12.4	12	10.7

* $p < 0.05$ for χ^2 tests.

41%; $\chi^2(6) = 15.6, p = 0.016$) and Health service navigation (42%, 29%, 24%, 22%; $\chi^2(6) = 22.0, p = 0.001$). For men, age differences were observed in two of the eight heiQ scales: Health-directed behaviour (12%, 47%, 41%, 30%; $\chi^2(6) = 15.8, p = 0.015$) and Skill and technique acquisition (54%, 69%, 39%, 39%; $\chi^2(6) = 16.6, p = 0.011$). Differences were not monotonic.

3.3.4. Education

Level of education was not associated with change (Table 4).

4. Discussion and conclusion

4.1. Discussion

A higher proportion of younger women reported benefits across most heiQ scales. The pattern in younger men was less clear and was limited to more practical concepts (health behaviours and skills). The absence of clear effects in men with regard to age group differences may be due to the small sample size. In general, younger people in our sample appear to have a greater capacity to benefit as they entered the courses with lower scores across all heiQ scales. These differences in baseline scores suggest that younger people were worse off and their motivation may have been focused on improving their well-being while it is possible that some older people may have joined a course for other, perhaps more social reasons. We also found that a smaller proportion of men reported benefits in the Social integration and support scale than women. This area has not been well investigated but the observed gender differences may also be a result of motivation to attend a course. Overall, men appear to benefit equally to women, although men are a much smaller proportion of the participants, which is a frequent observation in this area [10,24]. These observations provide new insights into the value of courses for specific subgroups in this greatly under-researched area [3].

It is interesting to note that outcomes for people across educational levels were similar. Many previous studies have used convenience samples that included individuals with higher education relative to the communities in which the studies were undertaken [14,25–29]. In the present study only about 15% of the course participants had university education while 13% of the sample had primary education or less. Additionally, there was sufficient statistical power to observe small differences across educational levels if they had existed. Given that no differences were observed, this finding suggests that the self-management courses that we studied may be broadly appropriate for a wide range of educational backgrounds. However, missing from our analyses is information on health status. This is important given that the greatest burden of disease exists in the lower socio-economic subgroups [30]. It is likely that people with poor to very poor health had substantial difficulty attending

the programs and therefore are underrepresented in our analyses. Further work is required to understand the effects of the programs in key target groups such as those with poor health and functioning. It is also noteworthy that survey-based studies such as this do exclude the more disadvantaged subgroups that may not be able to complete questionnaire assessments.

Few people reported a decline related to participation in a self-management course. Declines ranged from 7% in Skill and technique acquisition to 15% in Emotional well-being. Generally, the well-being of people with chronic conditions waxes and wanes but the data suggest that decline is the least common event. It is conceivable that participants may experience a decline in emotional well-being as a result of pre-existing conditions or events during the course, but it is somewhat more difficult to suggest how the scores on dimensions such as skills and techniques might decline as a result of either course participation or from concomitant life events. It is conceivable that participants acquire a different perspective on item content such that they temper their post-test scores relative to their pre-test scores. For example, some participants may have overrated themselves at pre-test and then provided a moderated or better informed post-test score resulting in an apparent decline. This phenomenon has been described as response shift and may lead to an overestimation or underestimation of outcomes in individuals [31].

Recent reviews and meta-analyses have documented the effectiveness of self-management courses where a wide range of measures have been used according to disease group [3,11]. The size of the impact from these summaries has been quite small. For arthritis, the measures often included are knowledge, psychological well-being as well as subjective clinical outcomes such as pain and disability. The latter assessments, in particular, have been associated with nil or small effects [11,12,32]. Summaries of the impact of self-management courses on conditions such as type 2 diabetes, hypertension and asthma have been larger and have included clinical measures such as glycosylated haemoglobin, systolic blood pressure and number of asthma attacks, respectively [3,11,32]. While the average impact of self-management courses on individuals has been found to be modest across settings, previous studies have provided little insight into the proportion of individuals who receive substantial changes as a result of participation.

In this study we applied the heiQ, which was derived from extensive consultation with a wide range of consumers and other stakeholders to obtain comprehensive information on what are valued outcomes from self-management courses. Each scale is designed to identify pertinent proximal outcomes and thus provide a clear indication of whether the intended impacts of the course were delivered. These scales are expected to be antecedents to better physical health. It is hoped that behaviour change (Health-directed behaviour) in conjunction with improved self-management skills (Self-monitoring and insight, Skill and

technique acquisition) as well as enhanced skills and knowledge to access health care resources (Health service navigation) lead to improvements in health and increased effectiveness in using health services. Several scales also broadly cover personal and psychological well-being (Positive and active engagement in life, Constructive attitudes and approaches, Social integration and support, Emotional well-being) which are also vehicles for improved clinical outcomes. Overall, the heiQ sub scales provide a profile of immediate subjective outcomes that should provide insights into the mechanisms by which self-management courses result in clinical outcomes.

We have chosen to report outcomes using the categories of substantial change (decline or improvement) and no change. Presentation using this method simplifies interpretation, is more statistically conservative and tends to be more meaningful for clinicians if the thresholds approximate a minimal clinically important difference (MCID). The field of MCID and like measures (e.g. minimal important difference, minimal detectable difference) is rapidly advancing [19,33–35] and recommendations regarding the preferred methods for developing them are becoming more evidence-based. While the 0.5 ES used in the present study is somewhat arbitrary it is at least a reasonably large threshold and individuals who improve or decline this amount have moved a considerable distance across items. The more common method used to ascertain change uses average change score. The main limitations of averages are that many researchers rely on the *p*-value to gauge impact of a program. This value is highly dependent on study sample size and while it may be significant it may mislead the unwary reader. A statistically significant change may represent a minor average change across individuals and have no clinical utility. Averages may also obscure clinically relevant information from subsets of individuals who report very large benefits and may even hide adverse effects. Finally, the proportion of people who have substantial change is easier to communicate to stakeholders (e.g. researchers, course leaders, policy makers).

This research has some potential limitations. First, we have taken a broad approach to outcomes of self-management courses. The types of courses included in the analyses covered generic chronic disease, arthritis, osteoporosis, fibromyalgia, pulmonary/heart failure, pain and stress. These have different educational objectives and intensities and could therefore be expected to have different outcomes in addition to attracting attendees with different characteristics. These pooled analyses provide an overview of the impact of the courses on demographic subgroups but future analyses that focus on specific course types are necessary, particularly matching course objectives with outcomes.

Missing data has the potential to introduce systematic bias. In total, about one quarter of participants who provided baseline data did not fill out follow-up questionnaires, which is a common observation even in controlled trials of patient education with active follow-up procedures [28,36–38]. It is

possible that this group comprised people who received fewer benefits resulting in our findings being overestimations of the true effects. While we found no demographic differences between those who did and did not provide complete data, baseline scores of those without follow-up data were significantly lower in seven of the eight heiQ scales. The reasons for drop-out or non-participation are likely to be complex, but these data suggest that this group may have had worse health status and therefore greater capacity to benefit from courses.

An important systematic bias in the evaluation of programs is the desire to appease or reward the group leader. This effect may be linked to social desirability [39,40]. Through the group process and sharing of personal information, strong positive relationships between participants and leaders may develop during the course. Furthermore, participants may be conscious that they are evaluating the course and participation may have required considerable personal effort. The combined effects of these experiences may lead to an “artificially” high endorsement of questionnaire items resulting in an overestimate of the outcomes for individuals. These effects are difficult to identify and control and have been found to be more common in women, older people and people of lower socioeconomic status [41].

A further challenge in the evaluation of group courses is the potential change in an individual’s perspectives on health and disease during the intervention. This phenomenon is commonly referred to as response shift [31] and may well be regarded as an intended outcome of courses [42]. Response shift has been defined as a change in the meaning of one’s self-evaluation of a target construct as a result of (a) recalibration (a change in a person’s internal standards of measurement), (b) reprioritization (a change in a person’s values) and (c) reconceptualization (a change in the way a person defines a target construct; e.g. quality of life) [43]. The group-based course may stimulate social comparisons [44], improved knowledge of issues around self-care and understanding of symptoms. Response shift has been found to occur in most people who take part in self-management courses [42]. Although its effect on measurement of outcomes assessment in this area has not been well defined it is likely to be an important area for future research.

4.2. Conclusion

This research demonstrates that substantial improvements occur in about one third of participants who attend self-management courses. The largest improvements were observed in Skill and technique acquisition and Self-monitoring and insight (49% and 41%, respectively). This is an important and reassuring finding given that at the very least self-management courses should broadly improve participants’ ability and capacity to self-manage their condition. Given that the assessment occurred immediately post course, the most immediate impacts would be expected

to relate to knowledge and skills, which are antecedents of important attitude, behaviour and health changes. While the least frequent improvements were in Health service navigation, Constructive attitudes and approaches and Social integration and support ($\geq 27\%$), these still appear to be reasonable impacts at the program level.

4.3. Practice implications

The results imply that current self-management programs are broadly applicable and younger women appear to receive greater benefits. The findings are reassuring in that a wide range of participants appear to gain an important range of skills particularly an ability to self-manage their condition. These results support the application of self-management courses suggesting that they are a useful adjunct to usual care for a modest proportion of attendees.

We confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of this research.

Acknowledgments

Dr. Osborne's work was supported in part by the Baker Trust, Buckland Foundation, the Arthritis Foundation of Australia and the National Health and Medical Research Council Career Development Award (400391). The authors would also like to thank Amanda Springer, Dianne Ferguson and Luke Tellefson for data collection and management support as well as all participants who kindly took part in the study and the coordinators and course leaders who administered the questionnaires.

References

- [1] World Health Organization. Department of Chronic Diseases and Health Promotion (CHP). Available at: <http://www.who.int/dietphysicalactivity/publications/facts/chronic/en/>. Accessed September 20, 2006.
- [2] Lawrence D. Chronic disease care: rearranging the deck chairs. *Ann Intern Med* 2005;6:458–9.
- [3] Newman S, Steed L, Mulligan K. Self-management interventions for chronic illness. *Lancet* 2004;364:1523–37.
- [4] Lorig K, Fries J. The arthritis helpbook, 5th ed., Cambridge, MA: Perseus Books; 2000.
- [5] Lorig K, Holman H, Sobel D, Laurent D, González V, Minor M. Living a healthy life with chronic conditions: self-management of heart disease, arthritis, diabetes, asthma, bronchitis, emphysema & others, 2nd ed., Boulder, CO: Bull Publishing; 2000.
- [6] Osteoporosis Victoria. The Osteoporosis Prevention and Self Management Course—leaders manual. Elsternwick: Osteoporosis Victoria, A division of Arthritis Victoria, 2001.
- [7] Department of Health. The Expert Patient: A new approach to chronic disease management for the 21st Century. September 14, 2001. Available at: <http://www.dh.gov.uk/assetRoot/04/01/85/78/04018578.pdf>. Accessed March 26, 2006.
- [8] National Health Service. Expert Patients Programme update. December 2005. Available at: http://www.expertpatients.nhs.uk/epp_update/eppupdate14.pdf. Accessed March 26, 2006.
- [9] Lorig K, Hurwicz M-L, Sobel D, Hobbs M, Ritter P. A national dissemination of an evidence-based self-management program: a process evaluation study. *Patient Educ Couns* 2005;59:69–79.
- [10] Commonwealth Government Department of Health and Ageing. National evaluation of the Sharing Health Care Initiative: final technical report. Canberra, 2005.
- [11] Chodosh J, Morton S, Mojica W, Maglione M, Suttrop M, Hilton L, Rhodes S, Shekelle P. Meta-analysis: chronic disease self-management programs for older adults. *Ann Intern Med* 2005;143:427–38.
- [12] Warsi A, LaValley M, Wang P, Avorn J, Solomon D. Arthritis self-management education programs: a meta-analysis of the effect on pain and disability. *Arthritis Rheum* 2003;48:2207–13.
- [13] Lorig K, González V, Laurent D. The chronic disease self-management program: leaders manual Palo Alto: Stanford University; 1999.
- [14] Lorig K, Lubeck D, Kraines R, Seleznick M, Holman H. Outcomes of self-help education for patients with arthritis. *Arthritis Rheum* 1985;28:680–5.
- [15] Osborne RH, Elsworth GR, Whitfield K. The Health Education Impact Questionnaire (heiQ): An outcomes and evaluation measure for patient education and self-management interventions for people with chronic conditions. (Submitted Patient Educ Counsel).
- [16] McClintock C. Evaluators as applied theorists. *Eval Pract* 1990;11:1–12.
- [17] Osborne R, Spinks J, Wicks I. Patient education and self-management programs in arthritis. *Med J Aust* 2004;180:S23–6.
- [18] Brown M, Forsythe A. Robust tests for the equality of variances. *J Am Stat Assoc* 1974;69:364–7.
- [19] Wyrwich K, Bullinger M, Aaronson N, Hays R, Patrick D, Symonds T. Estimating clinically significant differences in quality of life outcomes. *Qual Life Res* 2005;14:285–95.
- [20] Cohen J. Statistical power analysis for the behavioural sciences, 2nd ed., Hillsdale, NJ: Lawrence Erlbaum Associates; 1988.
- [21] Jaeschke R, Singer J, Guyatt G. Measurement of health status. Ascertain the minimal clinically important difference. *Control Clin Trials* 1989;10:407–15.
- [22] Lydick E, Epstein R. Interpretation of quality of life changes. *Qual Life Res* 1993;2:221–6.
- [23] Wyrwich K, Spertus J, Kroenke K, Tierney W, Babu A, Wolinsky F. Clinically important differences in health status for patients with heart disease: an expert consensus panel report. *Am Heart J* 2004;147:615–22.
- [24] Kennedy A, Gately C, Rogers A. EPP evaluation team. process evaluation of the EPP report II: Examination of the implementation of the expert patients programme within the structures and locality contexts of the NHS in England (PREPP study) Manchester: NPCRDC; 2005.
- [25] Lorig K, Sobel D, Stewart A, Brown B, Bandura A, Ritter P, González V, Laurent D, Holman H. Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization. *Med Care* 1999;37:5–14.
- [26] Lorig K, Mazonson P, Holman H. Evidence suggesting that health education for self-management in patients with chronic arthritis has sustained health benefits while reducing health care costs. *Arthritis Rheum* 1993;36:439–46.
- [27] Lorig K, Seleznick M, Lubeck D, Ung E, Chastain R, Holman H. The beneficial outcomes of the arthritis self-management course are not adequately explained by behavior change. *Arthritis Rheum* 1989;32:91–5.
- [28] Fu D, Fu H, McGowan P, Shen Y-E, Zhu L, Yang H, Mao J, Zhu S, Ding Y, Wei Z. Implementation and quantitative evaluation of chronic disease self-management programme in Shanghai. China: randomized controlled trial. *B World Health Organ* 2003;81:174–82.

- [29] Lorig K, González V, Ritter P. Community-based Spanish language arthritis education program: a randomized trial. *Med Care* 1999;37:957–63.
- [30] Pincus T, Callahan L. Associations of low formal education level and poor health status: behavioral, in addition to demographic and medical, explanations? *J Clin Epidemiol* 1994;47:355–61.
- [31] Sprangers M. Response-shift bias: a challenge to the assessment of patients' quality of life in cancer clinical trials. *Cancer Treat Rev* 1996;22:55–62.
- [32] Warsi A, Wang P, LaValley M, Avorn J, Solomon D. Self-management education programs in chronic disease: a systematic review and methodological critique of the literature. *Arch Intern Med* 2004;164:1641–9.
- [33] Salaffi F, Stancati A, Alberti Silvestri C, Ciapetti A, Grassi W. Minimal clinically important changes in chronic musculoskeletal pain intensity measured on a numerical rating scale. *Eur J Pain* 2004;8:283–91.
- [34] Sloan J. Assessing the minimally clinically significant difference: Scientific considerations, challenges and solutions. *COPD: J Chron Obstruct Pulm Dis* 2005;2:57–62.
- [35] Hays R. Approaches and recommendations for estimating minimally important differences for health-related quality of life measures. *COPD: J Chron Obstruct Pulm Dis* 2005;2:63–7.
- [36] Solomon D, Warsi A, Brown-Stevenson T, Farrell M, Gauthier S, Mikels D, Lee T. Does self-management education benefit all populations with arthritis? A randomized controlled trial in a primary care physician network. *J Rheumatol* 2002;29:362–8.
- [37] Barlow J, Turner A, Wright C. A randomized controlled study of the arthritis self-management programme in the UK. *Health Educ Res* 2000;15:665–80.
- [38] Lorig K, Laurent D, Deyo R, Marnell M, Minor M, Ritter P. Can a back pain e-mail discussion group improve health status and lower health care costs? A randomized study. *Arch Intern Med* 2002;162:792–6.
- [39] Crowne D, Marlowe D. A new scale of social desirability independent of psychopathology. *J Consult Psych* 1960;24:349–54.
- [40] Crowne D, Marlowe D. *The approval motive: Studies in evaluative dependence*. New York, London, Sydney: John Wiley & Sons, Inc.; 1964.
- [41] Visser A, Breehaer B, Kleijnen J. Social desirability and program evaluation in health care. *Imp Assess Bull* 1989;7:99–112.
- [42] Osborne R, Hawkins M, Sprangers M. A change of perspective: a measurable and desired outcome of chronic disease self-management intervention programs that violates pre-post assessment. *Arthritis Care Res* 2006;55:458–65.
- [43] Sprangers M, Schwartz C. Integrating response shift into health-related quality of life research: a theoretical model. *Soc Sci Med* 1999;48:1507–15.
- [44] Gibbons F. Social comparison as a mediator of response shift. *Soc Sci Med* 1999;48:1517–30.