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Self-management of chronic pain: a population-based study

Fiona M. Blyth[a,*], Lyn M. March[b], Michael K. Nicholas[a], Michael J. Cousins[b]

[a]*Pain Management and Research Institute, University of Sydney, Royal North Shore Hospital, St Leonards, NSW 2065, Australia*
[b]*Department of Rheumatology, University of Sydney, Royal North Shore Hospital, St Leonards, NSW 2065, Australia*

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Abstract

While effective self-management of chronic pain is important, clinic-based studies exclude the more typical pattern of self-management that occurs in the community, often without reference to health professionals. We examined specific hypotheses about the use of self-management strategies in a population-based study of chronic pain subjects. Data came from an Australian population-based random digit dialling computer-assisted telephone survey and included 474 adults aged 18 or over with chronic pain (response rate 73.4%). Passive strategies were more often reported than active ones: passive strategies such as taking medication (47%), resting (31.5%), and using hot/cold packs (23.4%) were most commonly reported, while the most commonly reported active strategy was exercising (25.8%). Only 33.5% of those who used active behavioural and/or cognitive strategies used them exclusively, while 67.7% of those who used passive behavioural and/or conventional medical strategies did so exclusively. Self-management strategies were associated with both pain-related disability and use of health services in multiple logistic regression models. Using passive strategies increased the likelihood of having high levels of pain-related disability (adjusted OR 2.59) and more pain-related health care visits (adjusted OR 2.9); using active strategies substantially reduced the likelihood of having high levels of pain-related disability (adjusted OR 0.2). In conclusion, we have shown in a population-based study that clinical findings regarding self-management strategies apply to the broader population and advocate that more attention be given to community-based strategies for improving awareness and uptake of active self-management strategies for chronic pain.

Keywords: Self-care; Chronic pain; Epidemiology

1. Introduction

Chronic conditions will be the major cause of death and disability globally by 2020 according to WHO estimates, and by then will account for two thirds of the global burden of disease (Epping-Jordan et al., 2001). The mounting burden of chronic illness on health care systems has to a large extent driven the increased focus by national governments on the importance of effective self-management in chronic illness. It is clear that good self-management is necessary for effective medical care for chronic illness (von Korff et al., 1997). Effective self-management is an established therapeutic goal for chronic pain per se (e.g. Borkan and Cherkin, 1996). In addition, pain reduction has been identified as a key 'tangible benefit' in self-management programs for a range of illnesses in a UK review (UK Department of Health Expert Patient Program) (UK Department of Health, 2001).

Understanding the extent and nature of daily self-management of chronic pain symptoms is important. A large number of studies in clinical populations has consistently shown that self-management of symptoms is associated with better outcome (Cohen et al., 2000; von Korff et al., 1994). In the case of low back pain, which is common and has a typically recurrent character, patient beliefs about self-management may have a profound influence on long-term costs of care (e.g. von Korff et al., 1994). However, studies based on clinical populations may

* Corresponding author. Tel.: +61 2 9926 6775; fax: +61 2 9926 6780.
E-mail address: fblyth@doh.health.nsw.gov.au (F.M. Blyth).

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exclude the more typical pattern of self-management, which occurs in the community without reference to health care providers (Verbrugge and Ascione, 1987). In particular, few studies include people with chronic pain who are infrequent users of health care providers (Egan and Katon, 1987). It is evident that a large proportion of people living with pain in the community are not disabled by it, suggesting that it is not the presence of pain alone that determines interference due to pain.

In this report, we examine specific hypotheses regarding the use of self-management strategies in a population-based study of chronic pain subjects. Based on the clinical literature, we hypothesized that use of active strategies, as opposed to passive strategies, would be associated with lower levels of disability, less distress, less reliance on medication, and less use of formal health care (doctors and allied health professionals). Our specific aims were:

(i) To describe use of self-management strategies in a population-based sample with chronic pain
(ii) To describe demographic and clinical characteristics of those using active vs passive strategies
(iii) To examine the strength of the relationship between self-management strategies and pain-related disability and pain-related health care use, using logistic regression modelling

2. Methods

2.1. Sampling

The sampling method used was based on a previous state-wide chronic pain prevalence study (Blyth et al., 2001). Data were collected by computer assisted telephone interview (CATI) techniques using random digit dialling methods within the Northern Sydney Area (NSA), an urban geographical area with a base population exceeding 700,000 (Australian Bureau of Statistics, 1997). A sampling frame of residential telephone numbers was constructed by identifying telephone number prefixes for eligible exchanges, then randomly generating the remaining digits by computer. Introductory letters were sent if numbers matched back to an address in electronic residential listings. Answering machine messages were left as part of the call protocol. Once contact with a household was made, participants were chosen by randomly sampling from eligible household members (18 years of age or more, and speaking English as their primary language) using CATI technology. No substitution of household members was permitted.

Data collection occurred between July and September, 1998. More details on the design and sample characteristics are available elsewhere (Blyth et al., 2003a,b).

2.2. Definitions

2.2.1. Chronic pain

Chronic pain was defined as pain experienced every day for three months or more in the 6 months prior to interview (IASP, 1986). Respondents were asked if they had experienced pain as defined separately for eight major body areas (head, neck, shoulders, arms, chest, abdomen, back and legs). They could nominate as many sites that were affected by pain as defined by the interviewer.

2.2.2. Pain disability

Pain disability was measured using the Chronic Pain Grade (CPG) (von Korff et al., 1992). The Chronic Pain Grade questionnaire contains three items on pain intensity (0–10 ratings of current, worst and average pain over a six month period); and 4 items on pain-related disability (number of days kept from usual activities because of pain, a 0–10 rating of interference with daily activity, a 0–10 rating of change in ability to take part in recreational, social and family activities, and a 0–10 rating of change in ability to work, all over a six month period). Responses were scored to produce 4 grades of pain severity: I: low disability-low intensity pain; II: low disability-high intensity pain; III: high disability-moderately limiting pain; IV: high disability-severely limiting pain.

2.2.3. Self-management strategies

Respondents were asked to nominate up to 5 strategies that they used to manage their pain in response to the question 'What do you find helps to relieve your [site/s] pain?'. Individual self-management strategies were grouped as follows, based on Brown and Nicassio (1987) (Table 1).

Pre-coded categories of self-management strategies were developed prior to the study, based on questionnaires used clinically in the multi-disciplinary clinic at the Pain Management and Research Institute. These were programmed into the Computer-Assisted Telephone Interview schedule and selected by the trained interviewers, where appropriate based on respondents' answers. Where the response did not match a pre-coded category, the text of the respondent answer was entered onto the computer to be coded later.

Of a total of 975 specific strategies nominated during interviews, 870 (89%) were assigned during the CATI process to the programmed precoded categories. There were 105 responses recorded as text fields. Of these, 46 were directly assignable to the precoded categories but had not been assigned during the interview. This left 59 text responses (6% of the total) which had to be coded. Two of the authors (FB and MN) coded these responses independently.

Table 1
Coding for self-management strategies

Active strategies		Passive strategies	
Active behavioural	Cognitive	Passive behavioural	Conventional medical
Correct posture	Relaxation	Diet	Medication
Exercise	Distraction	Avoiding activity	Physiotherapy
Modified use	Prayer	Rest	TENS
Social activities	Meditation	Hot baths/ shower	Braces
Work	Reduce stress	Hot/cold packs	Acupuncture
Usual tasks		Smoking/alcohol	Chiropractor
		Massage	

The grouping of specific strategies into broad categories was also done prior to data collection by two of the authors (FB and MN).

Of the 59 cases coded independently by the two authors, 47 (80%) were coded identically into active or passive categories by both and there were 12 cases, where the strategies were coded differently by the two coders.

2.2.3.1. Passive coping strategies. Passive coping strategies were defined as including any treatment (e.g. drugs, acupuncture, massage) where something was done to or given to the patient who, in turn, played a passive role. This category also included avoidance or escape manoeuvres by the person in pain (e.g. rest, using alcohol, having a hot bath). The treatments used by people to avoid or minimise their pain were divided into two sub-categories: 'conventional medical' (e.g. prescription analgesics, physiotherapy, TENS); and 'passive behavioural' (e.g. rest, heat treatments, cold packs).

2.2.3.2. Active coping strategies. Active coping strategies were defined as including any instrumental activity initiated by the person in pain to deal with his/her pain, but only if not characterised by avoidance or escape. Thus, rest could be thought of as initiated by the person in pain, but it was deemed 'passive' as it is typically a strategy intended to avoid or escape from pain rather than to function despite pain. It is also likely to be contrary to normal daily activities, such as work. Activities which were included in the active coping category were divided into two broad sub-categories of 'active behavioural' (e.g. exercising, working, and using correct postures) and 'cognitive' (e.g. use of prayer, relaxation/meditation, and mental distraction).

2.2.4. Psychological distress

Psychological distress was measured using a 10-item questionnaire (K10), which included items on the level of anxiety and depressive symptoms in the preceding 4 weeks. The K10 was developed for use in the National Health Interview Survey and the WHO World Mental Health Surveys (Kessler et al., 2002). Questionnaire items cover the range from minor symptoms to high levels of distress, making it useful in population surveys. For example, respondents were asked, 'In the last four weeks, how often did you feel that everything was an effort?' For each item, there is a five-point adjective scale related to the amount of time during the preceding 4 weeks that the respondent experienced the particular problem (from 'none of the time' to 'all of the time'). Raw scores ranging between 0–50 were converted to a *T*-score with a mean of 50 and a standard deviation of 10. In the Australian National Survey of Mental Health and Well-Being, K-10 scores of 60 or more (representing one standard deviation above the mean) have been found to correspond to high levels of psychological distress using other established measures such as the GHQ-12 (Furukawa et al., 2003).

2.2.5. Use of healthcare

Respondents were asked whether they had sought help for their pain in the previous 6 months from pre-specified categories of healthcare practitioners-doctors, allied health professionals and alternative practitioners. They were then asked how many visits they had made to the practitioner they had seen most often for their pain problem in each of the three categories.

2.2.6. Medications

Respondents were also asked about use of analgesic medications currently and in the previous 6 months, including those used intermittently and injected medications.

3. Analysis

3.1. Weighting

Two types of weights were used. The first, used in calculating prevalence estimates, adjusted for differences between the sample and the known population estimates for each Health Area. The second weight, used in analyses of relationships between variables, adjusted for differences in selection probabilities among respondents (arising from different stratum and household sizes).

3.2. Descriptive analysis

Differences between proportions were assessed using a two-proportion test with weighted standard errors.

3.3. Logistic regression

Logistic regression modelling was done using Stata Release 6.0 (StataCorp, 1999), and probability sampling weights were used. Two-level dependent variables for pain-related disability and high health service use were created for regression analysis. For the pain-related disability variable, Chronic Pain Grade scores were dichotomised with grades I and II grouped into a low disability group, and grades III and IV grouped into a high disability group, a grouping also used by the authors of the Chronic Pain Grade (von Korff et al., 1992). For the high health service use variable, respondents were categorised according to whether they were in the top quartile of number of pain-related visits to both doctors and allied health professionals (the high use group) or not. For both sets of models, independent variables were chosen based on previous studies (Blyth et al., 2001, 2003b) and demonstration of a significant association in $2\times r$ table analysis ($P\leq 0.1$), on the basis of an hypothesised relationship with pain-related disability. Age and sex were included in all models because of the fundamental biological significance of these variables.

Reduced (i.e. parsimonious models) were produced by a process of backwards elimination of independent variables. At each stage, the effect of dropping out an independent variable was assessed using the likelihood ratio test (G statistic) at a significance level of $P=0.05$. Odds ratios, beta coefficients and standard errors were inspected at each stage to check for possible confounding or effect modification. Goodness-of-fit and regression diagnostics for the reduced model were assessed using the methods described by Hosmer and Lemeshow (1989). If an independent

variable with a *P*-value exceeding $P = 0.05$ improved model fit it was retained in the reduced model. Model weighting was applied to the reduced models using Stata's *Svylogit* procedure.

4. Ethics approval

Ethics approval was obtained from the Northern Sydney Area Ethics Committee.

5. Results

Details of this cohort are available elsewhere (Blyth et al., 2003b). Briefly, 2092 subjects participated in the study (1169 women and 923 men; response rate, 73.4%). The overall study sample was demographically similar compared with the Northern Sydney Area as a whole while the chronic pain subgroup had a higher proportion of females, respondents aged 65 years or more, and persons employed full-time; this subgroup had a lower proportion with a university qualification (Australian Bureau of Statistics, 1998). Four hundred and seventy four of the 2092 respondents (293 women and 181 men) reported having chronic pain (age/sex-adjusted prevalence 22.1%; 95% CI, 20.2–24.0%). A greater proportion of females reported having chronic pain than males (24.1% [95% CI, 21.5–26.8%] versus 19.9% [95% CI, 17.1–22.7%]). Prevalence peaked in the 70 years and over age group for men (26%; 95% CI, 18–35%) and the 60–69 year age group for women (36%; 27–46%). High levels of pain-related disability (Chronic Pain Grades III and IV) occurred in 27% of the chronic pain respondents with data available ($n = 439$).

In Table 2, major groupings show how many respondents nominated one or more specific strategy which was coded to that major grouping (e.g. someone using active behavioural strategies may have used one or more such as exercise and using correct posture). Passive strategies were more often reported than active ones. Apart from exercise, taking medication, resting, and using hot/cold packs were the most common individual strategies reported. Very few reported no strategies at all. The number of strategies used ranged from 0 to 5 (mean and median = 2) (data not shown). It is interesting to note that exercise was prominent here, given that overall active behavioural strategies were not commonly used.

When the patterns of self-management strategies used by chronic pain respondents were examined (Table 3), the most common ones were conventional medical/passive behavioural, passive behavioural alone, conventional medical alone, and active behavioural alone. Cognitive strategies alone were rarely used. Only 33.5% of those who used active behavioural and/or cognitive strategies used them exclusively, while 67.7% of those who used passive

Table 2
Types of self-management strategies used

Strategy types	*N* of pain respondents[a]	% (95% CI)
Active behavioural	*156*	*34.0 (29.3–38.8)*
Exercise	120	25.8 (21.5–30.2)
Posture	52	12.1 (8.7–15.4)
Other[b]	8	1.7 (0.5–3.0)
Passive behavioural	*277*	*59.3 (54.5–64.2)*
Rest	150	31.5 (27.0–36.1)
Hot/cold packs	109	23.4 (19.1–27.6)
Massage	83	18.0 (14.2–21.8)
Hot showers	34	7.3 (4.7–9.9)
Hot baths	29	6.8 (4.2–9.4)
Change diet	16	3.1 (1.4–4.7)
Other[c]	4	0.9 (0.0–1.9)
Cognitive	*51*	*11.2 (8.1–14.4)*
Relaxation	39	8.9 (6.0–11.8)
Other[d]	15	3.0 (1.4–4.6)
Conventional medical	*252*	*52.1 (47.2–57.1)*
Take medication	228	47.0 (42.0–51.9)
Brace/other support	28	5.9 (3.6–8.2)
Chiropractic treatment	12	2.3 (0.9–3.7)
Physiotherapy	11	2.6 (0.9–4.3)
Other[e]	5	1.0 (0.1–1.9)

[a] Totals are for any mention of that category.
[b] Modified activities 7 (1.4%); social activities 1 (0.3%).
[c] Smoking/alcohol 2 (0.5%); avoided certain activities 2 (0.5%).
[d] Meditation 7 (1.4%); distraction 6 (1.4%);reduced stress 1 (0.1%); prayer 1 (0.1%).
[e] TENS machine 3 (0.7%); acupuncture 2 (0.3%).

Table 3
Patterns of self-management strategies used

Combinations of strategies	*N* of pain respondents	% (95% CI)
Conventional and passive behavioural	95	19.7 (15.8–23.6)
Passive behavioural	91	19.5 (15.5–23.5)
Conventional	80	16.9 (13.5–20.3)
Active behavioural	49	9.8 (7.0–12.7)
Active behavioural and passive behavioural	35	8.4 (5.6–11.2)
Conventional and active behavioural	30	6.3 (4.1–8.5)
Conventional and active behavioural and passive behavioural	26	5.1 (3.0–7.1)
Nil	17	3.6 (1.9–5.3)
Conventional and passive behavioural and cognitive	11	2.8 (1.0–4.5)
Passive behavioural and cognitive	10	2.1 (0.8–3.4)
Cognitive	9	1.9 (0.7–3.1)
Active behavioural and cognitive	6	1.3 (0.3–2.3)
Conventional and cognitive	5	1.1 (0.1–2.0)
Active behavioural and passive behavioural and cognitive	5	1.1 (0.1–2.0)
Conventional and active behavioural and passive behavioural and cognitive	4	0.8 (0.0–1.7)
Conventional and active behavioural and cognitive	1	0.2 (0.0–0.6)

Table 4
Characteristics of those using only active and only passive self-management strategies

Characteristic	Only active ($n=64$)	Only passive ($n=266$)	P-value
	N (%)	N (%)	
Demographic			
Sex			
Male	29 (43.9)	86 (35.6)	0.0679
Female	35 (56.1)	180 (64.4)	0.0679
Age group			
18–29	5 (11.4)	32 (15.7)	0.1102
30–39	8 (12.9)	34 (11.1)	0.1832
40–49	23 (37.9)	44 (17.1)	0.0009
50–59	8 (14.4)	55 (26.1)	0.0109
60–69	9 (10.6)	29 (10.7)	0.2445
70+	11 (12.9)	72 (19.3)	0.0404
In full-time employment	28 (49.2)	100 (43.1)	0.1051
Post-school qualification	30 (51.5)	82 (33.0)	0.0035
Private health insurance	45 (68.2)	164 (63.4)	0.1286
Government pension or benefit	12 (13.8)	71 (20.5)	0.0408
General health			
Psychosocial distress (K10 score of 60 or more)	9 (15.9)	53 (20.9)	0.1017
Poor/fair self-rated health	17 (23.5)	68 (24.1)	0.2296
Pain characteristics			
Pain-related disability (CPG III or IV)	5 (7.2)	81 (30.3)	0.0000
3 or more pain sites	7 (7.6)	60 (20.5)	0.0003
Cause of pain-none found	23 (35.6)	105 (35.4)	0.2455
Cause of pain-injury	30 (47.7)	94 (37.7)	0.0478
Cause of pain-health problem	11 (16.7)	67 (26.8)	0.0218
Pain duration 12 months or more	18 (29.5)	74 (30.8)	0.2139
expects pain problem to get worse	12 (20.5)	41 (14.9)	0.0962
Sleep problems due to pain	45 (73.5)	197 (75.9)	0.1800
Uses formal or informal help at home due to pain	12 (17.4)	72 (24.9)	0.0468
Oral medication			
Combination narcotic analgesics	6 (8.3)	42 (13.2)	0.0543
Takes narcotic or combination narcotic analgesics	8 (11.4)	43 (13.6)	0.1536
Takes 2 or more medications for pain	13 (23.5)	104 (38.1)	0.0077
Health services use			
Any doctor visits for pain in last 6 months	30 (46.2)	165 (60.7)	0.0143
Any other health professional visits for pain in last 6 months	20 (30.3)	142 (52.9)	0.0003
Any altermate practitioner visits for pain in last 6 months	14 (24.2)	56 (23.6)	0.2302
4 or more doctor visits for pain in last 6 months[a]	10 (13.6)	83 (28.2)	0.0018
6 or more other health professional visits for pain in last 6 months[a]	9 (12.9)	86 (30.3)	0.0002
GP visit in last 2 weeks for pain	5 (5.3)	50 (15.5)	0.0006
Radiological investigations for pain in last 6 months	18 (26.5)	90 (34.3)	0.0624
Hospital admission for pain in last 6 months	6 (9.1)	22 (7.7)	0.1797
Other			
Pain-related litigation	5 (7.6)	20 (6.5)	0.1922
Any days lost from work for pain in last 6 months[b]	8 (17.6)	42 (31.6)	0.0168
Any days working with pain in last 6 months[b]	35 (96.5)	128 (97.3)	0.1942

[a] Represents the top quartile for number of visits.
[b] Respondents in full-time or part-time work.

behavioural and/or conventional medical strategies did so exclusively. Exclusive use of passive strategies was four times more common than exclusive use of active strategies.

Table 4 shows a comparison of characteristics of those using exclusively active or passive strategies using univariate analysis. The most striking demographic finding was the positive association between using active strategies exclusively and higher socio-economic status (indicated by level of education, pension and private health insurance status) There was an unexpected non-significant trend for employment status. Exclusive use of active strategies was inversely associated with psychological distress and poorer self-rated health (non-significant). In terms of pain characteristics, using only active strategies was associated with four times less pain disability and two times less multiple sites (i.e. three or more sites), needing less help at home, less sleep disruption (non-significant). Those using exclusively active strategies were significantly more likely to attribute their pain to a preceding injury and correspondingly less likely to attribute it to a health problem. There was an unexpected non-significant difference in the expectation that pain would worsen in the future. There were no differences regarding pain duration or cause of pain. The findings for medication and health service use were in the expected direction-those using active strategies exclusively reported less use of combination opioids, multiple analgesic medications, fewer pain-related visits to doctors or allied health professionals, fewer recent GP visits or imaging investigations. There was a higher level of use of alternative practitioners and more hospital admissions (both findings non-significant and based on small numbers). In terms of work performance, those using active strategies exclusively had fewer days off work and a similar proportion working with pain (non-significant). Consistent with the role of injury as the cause of pain, more in this group reported pain-related litigation (findings non-significant and based on small numbers).

Multiple logistic regression was used to investigate the relationship between self-management strategies, pain-related disability and health service use (Table 5). In the first model with pain-related disability (CPG III or IV) as the dependent variable, self-management strategy variables for

Table 5
Adjusted odds ratios multivariate logistic regression modelling with pain-related disability and health care visits as the dependent variables

Dependent variable	Self-management strategies variables	Explanatory variables	Adjusted odds ratios[a] (95% C.I.)	*P*-value
Pain-related disability (Chronic pain Grade III/IV)	4 categories	Past or current legal claim related to pain	3.13 (1.43–6.85)	0.004
		Uses conventional medical self-management strategies	2.15 (1.26–3.67)	0.005
		Poor/fair self-rated health	1.92 (1.10–3.35)	0.021
		Psychological distress[b]	1.74 (0.93–3.23)	0.082
		Uses active behavioural self-management strategies	0.48 (0.27–0.85)	0.011
Pain-related disability (Chronic Pain Grade III/IV)	2 categories	Past or current legal claim related to pain	3.52 (1.56–7.94)	0.003
		Poor/fair self-rated health	1.83 (1.07–3.14)	0.028
		Psychological distress[b]	1.72 (0.93–3.20)	0.085
		Only uses active self-management strategies	0.18 (0.06–0.49)	0.001
Top quartile of doctor/allied health practitioner visits	4 categories	Uses opioid medication	3.74 (1.63–8.60)	0.002
		Chronic Pain Grade III or IV	3.05 (1.45–6.41)	0.003
		Uses passive behavioural self-management strategies	3.62 (1.69–7.73)	0.001
		Uses conventional medical self-management strategies	3.57 (1.54–8.30)	0.003
		Chronic pain due to injury	2.96 (1.42–6.15)	0.004
		Uses informal or formal help at home due to pain	2.23 (1.03–4.84)	0.043

[a] Age and sex terms included.
[b] Retained for improved model fit.

each of the four major groupings (conventional medical, active behavioural, passive behavioural and cognitive) were used. In this model, those using conventional medical strategies had two times higher levels of disability (OR = 2.15) compared with those who did not use these strategies. In the second model, where dummy variables for exclusively active and exclusively passive self-management variables were used, it is seen that exclusive use of active strategies was highly protective (OR = 0.18).

The same process was repeated for multiple logistic models for high health care visits (where the dependent variable was being in the top quartile for both doctor and allied health professional visits). Using the four major groupings of self-management strategies, use of both conventional medical and passive behavioural strategies were associated with a 3-fold risk of being a high user (OR = 3.57 and 3.62, respectively). Within the modelling dataset (417/474 who had no data missing for all variables) there were no cases in the group who used active strategies exclusively who were also in the group in the top quartile for visits, precluding modelling.

6. Discussion

This study, based on a random sample of community-dwelling chronic pain subjects and good response rate, provides insights into an increasingly important but data-poor area-self-management of symptoms by those with chronic pain who live in the community, regardless of whether they seek care for their pain.

The results of this study generally confirmed our hypotheses that use of active strategies would be associated with lower levels of disability, less distress, less reliance on medication, and less use of formal health care. Those with chronic pain used a wide range of self-management strategies, often combining those regarded as active for chronic pain with passive ones. The strategies used, and the frequency of their use, was consistent those found in other studies (e.g. Andersson et al., 1999; Carey et al., 1995; Crook et al., 1984). Exclusive use of passive strategies was four times more common than exclusive use of active strategies. Self-management strategies were strongly associated with both pain-related disability and use of health services in multiple logistic regression models. Again, the results were consistent-use of passive strategies was associated with an increased likelihood of having high levels of pain-related disability and more pain-related health care visits; use of active strategies was associated with a reduced likelihood of also having high levels of pain-related disability.

There were some unexpected findings; in most cases these were differences based on small absolute numbers showing non-significant trends. It is possible that the increased use of alternative practitioners is associated with a pro-active health orientation and higher socio-economic status in this group. Other studies have found a similar relationship between self-management strategies and both use of alternative practitioners and socio-economic status (e.g. Andersson et al., 1999; Haetsman et al., 2003). There was an unexpected non-significant difference in employment status between the groups who exclusively used active or passive strategies. However, a higher proportion of the latter group reported more days off work due to pain, which is consistent with our overall findings. The expectation that pain would worsen in the future was higher in the group that used active strategies exclusively (difference not statistically significant). That may reflect a realistic acceptance of chronicity (McCracken and Eccleston, 2003).

This study has limitations. The data presented here are based on self-report measures. In addition, because of the cross-sectional study design the direction of causality cannot be determined and it is possible that the self-management strategies reflect degree of disability rather than the reverse. However, it should be noted that the behavioural pain management literature does show that when disabled chronic pain patients are taught to use more active strategies (and to decrease their use of passive strategies) their disability diminishes (Morley et al., 1999). More light might also be shed on this issue from a follow-up study currently underway. The Northern Sydney Area is not demographically representative of NSW as a whole, as it has a higher proportion of both aged and high socio-economic status residents. However, the positive association between socio-economic status and use of active behavioural strategies seen in this study has also been found in a Swedish population-based study (Andersson et al., 1999). There is no generally agreed or preferred method for recording or analysing self-management strategies in the context of population studies (Carroll et al., 2002). Assessment of the use of cognitive strategies was particularly problematic in this study, and no available clinical measures were suitable for use in community settings. As a result we may have underestimated the use of these strategies, given their importance in clinical studies.

It is also likely that the context in which self-management strategies are used is an important consideration. Thus, what might be useful in one situation may not be so useful under other circumstances or as an invariant strategy. For example, taking rest breaks for acute flare-ups may be helpful, but not if that is the only strategy employed. It is possible that exclusive use of active versus passive strategies is not as important as the relative proportions of each that are used. For example, occasional use of analgesics for a flare-up in pain may be helpful, but if the cause of the flare-up is over-activity, then improved activity pacing might be a preferable option in the long run. Also, *not* doing some things, like catastrophising (self-defeating forms of thinking), may be as or more important as doing other things (e.g. Sullivan et al., 2001).

While many people with chronic pain develop active strategies without formal training (Verbrugge and Ascione, 1987), our results suggest that there is a gap between current thinking on best practice for chronic pain and widespread adoption of this practice within the community. The extent to which health professionals are teaching their patients effective self-management strategies for chronic pain is unclear; however, the limited effectiveness of clinical guidelines on clinician behaviour is well-known (Grimshaw et al., 2001). Our findings underline a great need for this to occur. If greater use of effective self-management of chronic pain in the community is to be achieved it would suggest that specific measures will be needed, from training doctors to community information interventions (e.g. Buchbinder and Jolley, 2004).

In conclusion, we have shown in a population-based study that clinical findings regarding self-management strategies apply to the broader population. Active self-management strategies are associated with lower levels of pain-related disability and health care use. We would strongly advise that more attention be given to community-based strategies for improving awareness and uptake of active self-management for chronic pain.

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