International Journal of
Rheumatic Diseases

International Journal of Rheumatic Diseases 2011; **14**: 61–67

ORIGINAL ARTICLE

Coping and disability: evidence from a developing country

Zeinab N. SLIM,[1] Alexander DOWLI,[2] Monique CHAAYA,[1] Ziyad MAHFOUD[1] and Imad UTHMAN[2]

[1]*Department of Epidemiology and Population Health and* [2]*Faculty of Medicine, American University of Beirut, Beirut, Lebanon*

Abstract

Aim: In view of the increasing burden of musculoskeletal-related disability, the growing number of older persons and the scarcity of research on musculoskeletal conditions in the Eastern Mediterranean region, coping with musculoskeletal problems deserves special attention. This paper examines how good coping links to musculoskeletal-related disability among Lebanese citizens aged 15 years and older.

Methods: The sample included 200 people living in southern Lebanon and who participated in the Community Oriented Program for Control of Rheumatic Diseases (COPCORD) survey. Disability and coping were assessed using self-reported questions. Covariates included demographics, musculoskeletal pain variables, and body mass index (BMI).

Results: Around one-third of the sample had lifetime functional disability due to musculoskeletal problems and 62% were coping well with their problems. Adjusted data showed that the odds of musculoskeletal-related disability among individuals who were not coping well was 2.35 times the odds of disability among individuals who were coping well with 95% CI = 1.10–5.02.

Conclusion: This study provides evidence of the importance of complementing pharmacological treatment with a cognitive-behavioral approach for management of musculoskeletal problems.

Key words: cognitive-behavioral approach, COPCORD, coping, Lebanon, musculoskeletal-related disability.

INTRODUCTION

Musculoskeletal conditions are a significant public health problem among adults of working age and account for a large proportion of disability.[1,2] Disability associated with musculoskeletal conditions severely limits the activities of daily living (ADLs),[3–5] increases healthcare expenses, adversely affects work, income and productivity, as well as social activities, and is linked to depression.[3,6] Modern disability management programs focus on coping rather than cure, and on self-care rather than just getting treatment.[7] Coping, defined as 'cognitive and behavioral efforts to manage the negative impact of stressful situations'[8] is a factor that has been increasingly linked to functional disability in musculoskeletal conditions. Several interventional and prospective studies have reported that coping skills are protective against disability.[9–13]

Lebanon, like many Middle Eastern countries, has a high percentage (7.4%) of the population aged 65 years or older,[14] and thus it is expected to have a significant burden from musculoskeletal-related disabilities. Available studies on musculoskeletal conditions only tackle one aspect, which is the prevalence of some rheumatic diseases,[15] while little is known about self-management and the effect of coping on disability. Coping was addressed in a study conducted to test a model of Lebanese family stress and coping among war

Correspondence: Monique Chaaya, DrPH, Department of Epidemiology and Population Health, American University of Beirut, 205A VanDyck Building, PO Box 11-0236, Riad El-Solh St., Beirut 1107-202, Lebanon.
Email: mchaaya@aub.edu.lb

victims and it showed that coping strategies can mediate and lead to the positive outcome of family adaptation.[16] This finding can be extended to study the association between musculoskeletal-related disability and coping. In addition, research findings on disability, as well as factors influencing it, are totally lacking in this part of the world and most of the published research has been based on Western cultures. Importantly, many studies have shown that coping strategies differ from one culture to another.[17–20] People in the Middle East and the Lebanese, in particular, value kinship and extended family ties, thus they tend to turn to others as a predominant way to cope with stress.[21] Community support groups and other psychological approaches to educate people on coping strategies are more available in Western cultures than in this region. Therefore, this paper provides insight on the association between coping and functional disability among Lebanese nationals aged 15 years and over in southern Lebanon, and makes recommendations about management of musculoskeletal disability. The paper also examines the relative contribution of the covariates that have been found to affect the relationship of coping and functional disability, such as socio-demographic variables, pain intensity, pain chronicity, number of pain sites and body mass index (BMI).

MATERIALS AND METHODS

Data for this paper were drawn from the population-based cross-sectional study carried out in two governorates in Lebanon, namely the South and Nabatieh governorates. The study consisted of two phases, a face-to-face interview to screen for musculoskeletal problems and a clinical examination of participants with current musculoskeletal problems. Recruitment efforts targeted a sample with an age and sex distribution proportionate to that of the baseline Lebanese population according to 2004 data from the Central Administration for Statistics. In the first phase, a total sample of 500 participants aged 15 years and above were interviewed using the Community Oriented Program for Control of Rheumatic Diseases (COPCORD) Core Questionnaire with a response rate of 98%. The questionnaire was validated and used in several COPCORD surveys in the Asia-Pacific region.[22–27] The Arabic version of the questionnaire which was used in this study was validated in Kuwait and has good psychometric properties.[28]

The questionnaire included a section requesting socio-demographic information (age, gender, education, occupation, income), and a second section consisting of questions on current and past musculoskeletal problems at nine locations, intensity of pain on a visual analog scale (VAS: ranging from 0 for no pain to 10 for very severe pain), as well as severity of pain and its duration. Questions also addressed coping and functional disability. As in most COPCORD surveys,[22–24] people who said they were currently limited in their activities completed a health assessment questionnaire (HAQ), which is scored from 1 (no disability) to 4 (maximum disability). Weight and height of the participants were measured and BMI was calculated.

The present paper focused on 200 individuals (40.1% of the original cohort, i.e. the 500 participants) who reported current and past musculoskeletal problems. However, information on musculoskeletal-related functional disability and coping was available for 178 participants out of the 200.

Measures

Functional disability, the dependent variable, was defined as current or past disability in performing daily activities due to pain, pain upon pressure, swelling, or stiffness in the bones, joints or muscles. The three original categories of this variable (never disabled, previously disabled and currently disabled) were grouped into 'never disabled' and 'ever disabled'. The study included detailed information on limitation in activities of daily living due to musculoskeletal pain such as: dressing, walking, lifting glass to mouth, bathing, getting in and out of bed, getting into a car, and squatting.

Coping with musculoskeletal problems, the main independent variable, was assessed with a self-reported question on how well the participant was coping with the problem. The answers were a 4-point Likert scale ranging from coping very well to not coping at all. They were grouped into 'coping well' which included coping well and very well, and 'not coping well' which included both coping not that well and not coping at all.

Control variables included socio-demographic characteristics (age, gender, marital status, working status, household income and education), musculoskeletal pain variables (pain chronicity, number of pain sites and pain intensity) as well as BMI. Household income was also included and was grouped into two categories: ≤US$333/month or >US$333/month. This cut-off point corresponds to the official minimum monthly wage as of May 2008. Therefore, ≤US$333/month is considered as low socioeconomic status.

Analysis

Sample characteristics were summarized using means and standard deviations (SD) for continuous variables such as age and pain intensity and frequency distributions for categorical variables such as gender, marital status, working status, household income, education, pain chronicity, number of pain sites and BMI.

Bivariate association between functional disability, coping and possible determinants were assessed using chi-squared test for categorical variables (or Fisher's exact test when counts were small) and the independent *t*-test for continuous variables. Variables that were significant at the bivariate level were included in the final multivariate logistic regression model which provided adjusted 95% CI. Significance was set at the 5% level. All analyses were done using the Statistical Package for Social Sciences, version 16 (SPSS Inc., Chicago, IL, USA).

Ethics

The COPCORD survey was approved by the Institutional Review Board at the American University of Beirut. Written informed consent was obtained from the respondent prior to the interview. The guardians' signatures were requested for participants who were under the age of 18 years. Confidentiality and anonymity were ensured by analyzing data based on ID numbers assigned to each questionnaire.

RESULTS

The original cohort (500 participants) had a mean age of 38.2 years (SD = 16.9) and 50% were female. While the mean age of the 178 participants who reported lifetime musculoskeletal problems was higher (45.0 years; SD = 17.0), the majority were female (57.1%) and ever-married (70.3%). Almost half the participants were working at the time of the interview and more than one-third (36.6%) earned a monthly income of ≤US$333/month (minimum wage). Almost 46% had intermediate or high school education.

The clinical examination of participants with current musculoskeletal problems revealed that 42.8% of the 178 had confirmed musculoskeletal diseases and 4.0% needed further laboratory tests to confirm the diagnosis. The proportions of some of the diagnosed diseases among the 178 were: osteoarthritis (13.5%); rheumatoid arthritis (2.8%); fibromyalgia (2.2%); ankylosing spondylitis (1.1%); and degenerative musculoskeletal disease (7.9%).

Lifetime functional disability due to musculoskeletal problems was reported by one-third of the participants. The great majority (90.7%) had their disability for at least 3 months which we considered as having chronic musculoskeletal -related disability. The most commonly affected activities for both genders were squatting (92.5%), lifting a bucket of water (87.5%) and bending (83.6%). Sixty-two percent reported coping well with their musculoskeletal problems.

Table 1 presents the results of the bivariate analyses predicting disability (the dependent variable). It showed that among those who were coping well, only 21.8% experienced disabilities at one point of time in their life compared to 50% of those not coping well. The crude odds ratio (OR) between disability and coping was 3.6 (95% CI: 1.80–6.90). All sociodemographic variables, except for monthly income, and the three pain variables, were significantly associated with disability. After adjusting for possible covariates, disability remained significantly associated with coping with an OR of 2.35 (Table 2).

DISCUSSION

This study examined the association between coping and functional disability among individuals with musculoskeletal problems in southern Lebanon. To our knowledge, this issue has not previously been addressed in this region, where rheumatology as a practice is not well established and research lags behind. The findings confirm our hypothesis that coping with musculoskeletal problems is protective against functional disability and is in line with other studies.[12,13,29,30]

What is important is that the significance of coping is as equal as other important variables in the model, such as pain intensity. This implies that coping, defined as purposeful efforts to manage the negative impact of stress, is indicative of other important and unexplored variables in this study. Several underlying explanations can be given as to why some people are able to adjust relatively well, learn to live normally and resume their work productively, despite their disability. Some variables that are present in the literature but were not measured in our study, such as patients' compliance with drug intake. One can say that compliance with drug intake decreases the symptoms and physical disability, and that a decrease in symptoms improves compliance. As a result, the cycle is essential for someone who wants to cope well with the disease. It was found that the odds of

Table 1 Distribution of respondents by functional disability, coping and selected covariates

	Total	Disabled (n = 58) %	Unadjusted OR (95% CI)	*P*-value
Pain coping				
Coping well	110	21.8	1	**0.0001***
Coping not that well	68	50.0	3.63 (1.88–6.99)	
Demographic characteristics				
Age: mean ± SD		50.69 ± 17.08	1.03 (1.01–1.05)	**0.003***
Male	77	27.3	1	
Female	102	37.3	1.59 (0.83–3.04)	
Education				
Illiterate/read and write/elementary	62	51.6	5.66 (1.97–16.25)	**0.0001***
Intermediate or high school	81	25.6	1.82 (0.63–5.24)	
University	33	15.2	1	
Marital status				
Single	51	23.5	1	0.089**
Ever married	125	36.8	1.85 (0.88–3.86)	
Working status				
Working	90	24.1	1	**0.016****
Not working	87	41.1	2.16 (1.13–4.11)	
Monthly income				
≤Minimum wage (US$333/month)	64	37.5	1.45 (0.76–2.77)	0.291**
>Minimum wage (US$333/month)	111	29.7	1	
BMI				
≤25 (normal)	64	29.7	1	**0.02****
>25–30 (overweight)	55	21.8	0.67 (0.29–1.53)	
>30 (obese)	59	45.8	2.00 (0.95–4.21)	
Pain variables				
Pain chronicity				
No chronic musculoskeletal problem	45	11.1	1	**0.0001***
Chronic musculoskeletal problem in at least one location	133	39.8	5.50 (2.01–15.05)	
Number of pain sites				
Single site pain	62	17.7	1	**0.002***
Multisite pain	115	40.9	3.31 (1.56–7.04)	
Pain intensity (VAS) (mean ± SD)		6.34 ± 2.66	1.27 (1.09–1.48)	**0.002***

**P*-value < 0.01, ***P*-value < 0.05.

noncompliance among the depressed (i.e. people who are unable to manage the impact of stress) is three times the odds of noncompliance among the non-depressed.[31] Another possible explanation is that psychological factors (non-coping, depression, passive appraisal) along with stressful life events, influence physiological responses, particularly disturbing the homeostasis of the neuroendocrine and immune system, thus affecting physical disability and disease activity.[32] Also of interest, copers give efforts to return their body aches back to normal baseline, or what is also known as a new homeostasis. These efforts necessitate a considerable amount of energy. If one is not in a fit psychological state to launch these efforts, then the patient will be less willing to engage in activities of daily living, which in turn increases disability. In addition, those who show an endurance behavior, whereby trying to resist pain and resuming their daily activities show less disability.[33] Another major factor that can explain coping is the time that one spends thinking negatively about the disease. Suppression of thoughts has been found to be associated with decreased disability.[33] This was observed in our study whereby copers were more likely to be of working class and feel less disabled than non-working class. Additionally, it can also be said that going to work is protective against a sedentary lifestyle, which by itself increases disability, and is protective as well against

Table 2 Results of the fully adjusted regression model for the association between coping and functional disability

Fully adjusted model (adjusted for coping, sociodemographics and chronicity of musculoskeletal problems)		
	OR	95% CI
Coping		
Coping well	1	
Coping not that well	2.35	1.10–5.02
Age	1.005	0.97–1.03
Gender		
Male	1	
Female	1.26	0.53–3.01
Education		
Illiterate/read and write/elementary	4.13	1.09–15.61
Intermediate or high school	1.87	0.59–5.95
University	1	
Marital status		
Single	1	
Ever-married	1.20	0.46–3.14
Working status		
Yes	1	
No	1.25	0.53–2.93
BMI		
≤25 (normal)	1	
>25–30 (overweight)	0.41	0.15–1.09
>30 (obese)	0.82	0.32–2.11
Pain variables		
No chronic musculoskeletal problem	1	
Chronic musculoskeletal problem in at least one location	3.42	1.15–10.23

depression among the elderly,[34] which blocks the formation of a vicious cycle of drug noncompliance and autoimmune changes, as explained previously.

This study has some limitations. The reciprocal nature of the cross-sectional design does not allow testing causal relationships. A disabled person may be more likely to be a non-coper or those who do not cope well may be more likely to suffer from disability. Furthermore, because of the use of a self-reported measure of disability, non-copers tend to underestimate their ability for physical functioning. For that reason, it is important to couple the self-reported measure with objective measure of physical performance. Also, the self-reported measure and the way coping was assessed may be vulnerable to bias and inaccuracy. Most studies gauged in-depth into coping and its strategies, while in our study, the measure was a simple question on how well the person was coping. This type of question is mood-dependent and requires more clarification to ensure standard comprehension by all respondents. The sample size was enough to investigate the correlations; however, a larger sample size is needed to have more power and to decrease the width of the confidence intervals. Finally, further study with more comprehensive lists of covariates such as drug compliance and other mental health questions, can help in explaining more the relationship between coping and disability.

This topic is of great importance and it is a wake-up call for healthcare providers and opens an interesting avenue to pursue more scientific evidence on the role of psychological factors on musculoskeletal-related disability. Moreover, the growth of the aged population requires that more attention be given to the area of rheumatology in Lebanon. Pharmacological treatment is usually difficult to administer to the elderly; as a result, a cognitive-behavioral approach is an alternative or at least complementary to the classical medical treatment.[35] Paradoxically, many healthcare providers still insist on a biomedical approach, believing that the cognitive approach is not within their domain or that any psychological issue will be resolved after administration of the pharmacological treatment.[36] Important as well is the stigmatization of psychological issues in this part of the world which hinders the development of the cognitive-behavioral approach. The findings of the study are an eye-opener for psychologists who should collaborate with rheumatologists as a first step in implementing a biopsychosocial approach which has been shown to be very effective in many studies. Moreover, empowering the patient with self-management tools and coping strategies and providing education about the etiology of the musculoskeletal problems can help in decreasing the negative thoughts and developing self-efficacy and self-esteem.[7] A future longitudinal study of a cohort of Lebanese nationals could better ascertain the relationship between coping and musculoskeletal-related disability. Probing more into the different coping strategies and developing an objective measure for coping and disability is also needed. The findings of the study were statistically significant, but what about clinical significance? This mandates clinical trials and interventional studies to answer this question.

ACKNOWLEDGEMENTS

The authors thank ABOTT laboratories for supporting the COPCORD study conducted in 2007. We also thank the data collection team and the study participants.

REFERENCES

1 WHO Scientific Group (2003) The burden of musculoskeletal conditions at the start of the new millennium. *World Health Organ Tech Rep Ser* **919**, i–X, 1–218.
2 Woolf AD, Akesson K (2001) Understanding the burden of musculoskeletal conditions. *BMJ* **322**, 1079–80.
3 Badley EM, Rasooly I, Webster GK (1994) Relative importance of musculoskeletal disorders as a cause of chronic health problems, disability, and health care utilization: findings from the 1990 Ontario Health Survey. *J Rheumatol* **21**, 505–14.
4 Smolen JS (2004) Combating the burden of musculoskeletal conditions. *Ann Rheum Dis* **63**, 329.
5 Yelin E (1992) The cumulative impact of a common chronic condition. *Arthritis Rheum* **35**, 489–97.
6 Reginster J-Y (2002) The prevalence and burden of arthritis. *Rheumatology* **41**, 3–6.
7 Main CJ, Williams AC (2002) ABC of psychological medicine: musculoskeletal pain. *BMJ* **325**, 534–7.
8 Lazarus R, Folkman S (1984) *Stress, Appraisal, and Coping*. Springer Pub Co, New York.
9 Lillefjell M, Krokstad S, Espnes G (2007) Prediction of function in daily life following multidisciplinary rehabilitation for individuals with chronic musculoskeletal pain; a prospective study. *BMC Musculoskeletal Disorders* **8**, 65.
10 Rapp SR, Rejeski WJ, Miller ME (2000) Physical function among older adults with knee pain: the role of pain coping skills. *Arthritis Care Res* **13**, 270–9.
11 Keefe FJ, Caldwell DS, Williams DA, *et al.* (1990) Pain coping skills training in the management of osteoarthritic knee pain: II. Follow-up results. *Behavior Therapy* **21**, 435–47.
12 Leibing E, Pfingsten M, Bartmann U, Rueger U, Schuessler G (1999) Cognitive-behavioral treatment in unselected rheumatoid arthritis outpatients. *Clin J Pain* **15**, 58–66.
13 Åsenlöf P, Denison E, Lindberg P (2005) Individually tailored treatment targeting activity, motor behavior, and cognition reduces pain-related disability: a randomized controlled trial in patients with musculoskeletal pain. *J Pain* **6**, 588–603.
14 Sibai AM, Sen K, Baydoun M, Saxena P (2004) Population ageing in Lebanon: current status, future prospects and implications for policy. *Bull World Health Organ* **82**, 219–25.
15 Uthman I, Kassak K, Sanjakdar R, Mendelek V, Masri AF, Nasr FW (1997) Letter from Lebanon. *Br J Rheumatol* **36**, 806–7.
16 Farhood LF (1999) Testing a model of family stress and coping based on war and non-war stressors, family resources and coping among Lebanese families. *Arch Psychiatr Nurs* **13**, 192–203.
17 Chang EC (1996) Cultural differences in optimism, pessimism, and coping: predictors of subsequent adjustment in Asian American and Caucasian American college students. *J Counseling Psychol* **43**, 113–23.
18 Sinha BK, Willson LR, Watson DC (2000) Stress and coping among students in India and Canada. *Can J Behav Sci* **32**, 218–25.
19 Lam AG, Zane NWS (2004) Ethnic differences in coping with interpersonal stressors: a test of self-construals as cultural mediators. *J Cross Cult Psychol* **35**, 446–59.
20 Essau CA, Trommsdorff G (1996) Coping with University-related problems: a cross-cultural comparison. *J Cross Cult Psychol* **27**, 315–28.
21 Abu-Laban B (1980) *An Olive Branch on the Family Tree: The Arabs in Canada*. McClelland & Stewart, Toronto, Canada.
22 Al-Awadhi AM, Olusi SO, Al-Saeid K, *et al.* (2005) Incidence of musculoskeletal pain in adult Kuwaitis using the validated Arabic version of the WHO-ILAR COPCORD core questionnaire. *Ann Saudi Med* **25**, 459–62.
23 Veerapen K, Wigley RD, Valkenburg H (2007) Musculoskeletal pain in Malaysia: a COPCORD survey. *J Rheumatol* **34**, 207–13.
24 Darmawan J, Valkenburg HA, Muirden KD, Wigley RD (1992) Epidemiology of rheumatic diseases in rural and urban populations in Indonesia: a world Health Organization International League Against Rheumatism COPCORD study, stage I, phase 2. *Ann Rheum Dis* **51**, 525–8.
25 Atiqul HaqS, Darmawan J, Islam MN, *et al.* (2005) Prevalence of rheumatic diseases and associated outcomes in rural and urban communities in Bangladesh: a COPCORD study. *J Rheumatol* **32**, 348–53.
26 Chopra A, Patil J, Billampelly V, Ralwani J, Tandale HS (2001) Prevalence of rheumatic diseases in a rural population in western India: a WHO-ILAR COPCORD Study. *J Assoc Physicians India* **49**, 240–6.
27 Chopra A, Saluja M, Patil J, Tandale HS (2002) Pain and disability, perceptions and beliefs of a rural Indian population: a WHO-ILAR COPCORD study. WHO-International League of Associations for Rheumatology. Community Oriented Program for Control of Rheumatic Diseases. *J Rheumatol* **29**, 614–21.
28 Al-Awadhi AM, Olusi SO, Moussa M, *et al.* (2004) MSK pain, disability, and health seeking behaviors in adult Kuwaitis using a validated Arabic version of the WHO-ILAR COPCORD Core Questionnaire. *Clin Exp Rheumatol* **22**, 177–83.
29 Flor H, Turk DC (1988) Chronic back pain and rheumatoid arthritis: predicting pain and disability from cognitive variables. *J Behav Med* **11**, 251–65.
30 Geisser ME, Roth RS (1998) Knowledge of and agreement with chronic pain diagnosis: relation to affective distress, pain beliefs and coping, pain intensity, and disability. *J Occup Rehabil* **8**, 73–88.
31 DiMatteo MR, Lepper HS, Croghan TW (2000) Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and

depression on patient adherence. *Arch Intern Med* **160**, 2101–7.
32 Cutolo M, Prete C, Walker J (1999) Is stress a factor in the pathogenesis of autoimmune rheumatic diseases? *Clin Exp Rheumatol* **17**, 515–8.
33 Karsdorp PA, Vlaeyen JWS (2009) Chronic pain: avoidance or endurance? *Eur J Pain* **13**, 551–3.
34 Chaaya M, Sibai AM, Tabbal N, Chemaitelly H, El Roueiheb Z, Slim ZN (2009). Work and mental health: the case of older men living in underprivileged communities in Lebanon. Ageing & Society Forthcoming(-1), 1–16.
35 Widner S, Zeichner A (1993) Psychologic intervention for the elderly chronic pain patient. *Clin Gerontol* **13**, 3–18.
36 Vranceanu A, Barsky A, Ring D (2009) Psychosocial aspects of disabling musculoskeletal pain. *J Bone Joint Surg* **91**, 2014–8.