Physical and Psychological Correlates of Disability among a Cohort of Individuals with Knee Osteoarthritis

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RÉSUMÉ

Bien que les corrélats physiques de la gonarthrose soient bien documentés, certains aspects du fonctionnement psychologique pouvant avoir un effet sur les conditions générales et fonctionnelles le sont moins bien. Le présent article décrit les résultats d'une analyse transversale ayant porté sur la force de la relation entre des facteurs psychologiques sélectionnés et la capacité de marcher des adultes souffrant de gonarthrose. Les variables étudiées étaient la douleur, la dépression, le degré d'autoefficacité de la gestion de la douleur et d'autres symptômes, l'endurance à la marche, la vitesse de marche, et l'effort perçu lors de la marche. L'échantillon, qui comprenait 57 personnes présentant une gonarthrose unilatérale et 43 personnes présentant une gonarthrose bilatérale, radiographique et symptomatique, dont l'âge moyen était de 69,9 ans ±1 an, a fait l'objet d'une évaluation standard lors d'un seul essai à l'aide de plusieurs questionnaires validés et d'une série d'essais de marche sur terrain plat. Des analyses de régression multiples et bidimensionnelles ont révélé que 1) des scores d'autoefficacité plus élevés en matière de douleur et d'autres symptômes étaient associés à des degrés de douleur plus faibles ($r = -0{,}29, -0{,}20.$); à l'effort perçu pendant la marche ($r = -0{,}29, -0{,}31$) et à la dépression ($r = -0{,}46, -0{,}54$) ($p < 0{,}001$); 2) les sujets démontrant une plus grande autoefficacité en matière de gestion des symptômes autres que la douleur ont aussi affiché une vitesse de marche plus rapide et marché plus rapidement que ceux ayant des scores plus faibles en autoefficacité ($r = -0{,}30, -0{,}31$) ($p < 0{,}001$); 3) l'autoefficacité pour la douleur était le plus fort prédicteur de l'intensité de la douleur, et l'autoefficacité pour la gestion des symptômes était le plus fort prédicteur de l'effort perçu pendant la marche, de la dépression et de l'autoefficacité lors de la douleur. Bien qu'aucune relation de cause à effet n'ait pu être déduite de l'analyse transversale, ces données suggèrent que les efforts visant à accroître l'autoefficacité en matière de gestion de la douleur et d'autres symptômes pourraient avoir une influence sur l'état affectif, les fonctions, et les perceptions liées à l'effort de personnes souffrant d'une importante gonarthrose.

ABSTRACT

While the physical correlates of knee osteoarthritis are well documented, less well documented are aspects of psychological functioning that may affect overall health and functional status. This paper describes the findings of a cross-sectional analysis that examined the strength of the relationship between selected psychological factors and the walking ability of adults with knee joint osteoarthritis. The variables assessed were pain, depression, levels of self-efficacy for pain and other-symptoms management, walking endurance, walking speed, and perceived exertion when walking. The sample, including 57 persons with unilateral and 43 persons with bilateral radiographic and symptomatic knee osteoarthritis, mean age, 69.9 ± 1 years, underwent standard assessment procedures on a single test occasion using several validated questionnaires and a series of walking tests on level ground. Bivariate and multiple regression analyses revealed that (a) higher pain and other-symptoms self-efficacy scores were associated with lower levels of pain ($r = -0.29, -0.20.$), perceived exertion during a walking task ($r = -0.29, -0.31$), and depression scores ($r = -0.46, -0.54$) ($p < 0.001$); (b) subjects with higher levels of self-efficacy for managing symptoms other than pain also recorded faster and fast speed walking velocities than those with lower self-efficacy scores ($r = 0.30, 0.31$) ($p < 0.001$); (c) self-efficacy for pain was the strongest predictor of pain intensity, and self-efficacy for symptom management was the strongest predictor of perceived exertion during walking, depression, and pain self-efficacy. Although no cause–effect relationship can be deduced from a cross-sectional analysis, these data imply that efforts to heighten self-efficacy for pain and other-symptoms management may influence the affective status, function, and effort-related perceptions of people with knee osteoarthritis quite significantly.

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Introduction

Osteoarthritis, a major cause of disability in older people (White, 2006), is a prevalent joint disease commonly associated with varying degrees of pain and functional disability, premature losses of wage earnings, and poor life quality (Douglas, Simon, & Aberman, 2001; Peat, McCarney, & Croft, 2001). Despite its prevalence and significant physical, economic, psychological, and social impact (Weinberger, Tierney, & Booher, 1989), no known cure exists for the condition. While surgery is useful in restoring function and ameliorating pain, not all joints affected by degenerative arthritis require, or are amenable to, joint surgery (Peat et al., 2001). Efforts to reduce arthritic pain with medications, as recorded by Mankin and Treadwell (1986) and Schnitzer (1993), frequently prove ineffective (Simon, 2000) and can hasten joint degeneration processes (Felson, 1993), produce systemic toxic side effects (Griffin, Brandt, Liang, Pincus, & Ray, 1995) or excess mortality due to gastrointestinal disease, and are particularly dangerous in the elderly (Monson & Hall, 1976; White 2006).

Cyclooxygenase-2 (COX-2) inhibitors, which cause fewer gastrointestinal problems, are found to increase the risk of vascular events, including myocardial infarction and stroke (White, 2006). Although glucosamine, an amino sugar that is a precursor of cartilage matrix, may provide relief from pain, is popular, and may be effective and safe in delaying progression and improving symptoms, there are sparse data on its structural efficacy and safety (Poolsup, Suthisisang, Channark, & Kittikulsuth, 2005). Moreover, its effect is not consistently associated with benefits in all trials (White, 2006) and it may be more effective in patients with lower rather than higher body mass indices (which is more uncommon in this condition), those with patello-femoral compartment osteophyte problems, and those with low functional self-efficacy (Bennett, Crossley, Brukner, & Hinman, 2007). Further, since no pharmacologic drug has been found to unequivocally reverse or delay the progression of osteoarthritis (Brooks & Day, 1991), their long-term efficacy has been challenged (Schnitzer, 1993; White, 2006).

Given the chronicity of the disease, its tendency to progress slowly and involve an increasing number of joints, the disability arising from osteoarthritis, especially at the knee joint (where osteoarthritis is very common [Peat et al., 2001]), can be as great as that of cardiac disease and greater than that of any other medical condition in the elderly (Guccione et al., 1994). In addition to its impact on functional independence, especially among people older than 55 years of age (Peat et al., 2001), its association with an increased risk of falling and hip fracture (Arden et al., 2006) should not be ignored because this is often a highly disabling condition with a high mortality rate among seniors. Even though exercise may predict better responses to the condition (Roddy et al., 2005), adherence to exercise routines, which is an important predictor of success, is often problematic. Consequently, the immense burden of osteoarthritis remains a challenge and, to overcome the limited efficacy of conventional medicine in treating the condition, considerable attention is currently being paid to alternative solutions for improving disease outcomes and life quality for individuals affected (Jordan et al., 2003).

In this respect, the multifactorial nature of osteoarthritis and the knowledge that disease has overlapping psychological as well as physical correlates indicates that, to achieve the best outcomes, a multidimensional approach must be adopted (Jordan et al., 2003). Thus, even though some topical preparations of non-steroidal anti-inflammatory products (Kilminster & Mould, 1999), oral non-steroidal drugs, and paracetamol (acetaminophen) may provide modest relief from pain (Bradley, Katz, & Brandt, 2001), they do not address other factors that potentially protect against a poor functional outcome among people with knee osteoarthritis, including muscle strength and endurance, psychosocial factors, mental health status, self-efficacy for managing the disease, social support, and the individual's activity level as measured by the

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amount of aerobic exercise per week (Peters, Sanders, Dieppe, & Donovan, 2005; Sharma et al., 2003). In addition to a variety of medical and/or surgical approaches, current recommended strategies for improving the outcome and life quality of people with knee osteoarthritis stress the importance of: patient education, self-management training, lifestyle modification, and improved emotional and social support (Buckwalter et al., 2001; Douglas et al., 2001; Manek, 2001).

In particular, given the role personal control beliefs and the individual's confidence in her/his ability to carry out specific tasks or behaviours—a concept known as self-efficacy (Bandura, 1986)—have been shown to have in mediating health outcomes (Arnstein, Caudill, Mandle, Norris, & Beasley, 1999; Lefebre et al., 1999; Riesma et al., 1998), several studies have been conducted to examine the role of self-efficacy beliefs among people with knee osteoarthritis, in the context of pain, function, and general disability levels (e.g. Gaines, Talbot, & Metter, 2002; Harrison, 2004).

Most commonly, *perceived self-efficacy*, denoting the confidence individuals have in managing their symptoms as well as their self-efficacy or confidence in carrying out functional activities—which may not be the same because self-efficacy is a behaviour-specific construct—constitute the specific focus of such studies. Since it has been demonstrated that self-efficacy perceptions are modifiable and can be improved systematically for a number of different behaviours (Marks, 2001), studies have examined the use of educational programs based on self-efficacy theory (e.g., Barlow, Williams, & Wright, 1999; Lorig, Lubeck, Kraines, Selznick, & Holman, 1985). Others have examined whether exercise, diet, and activity-promotion can produce more favourable outcomes for people with arthritis than can standard education programs, including mobility-related self-efficacy and task-specific control beliefs (Buszewicz et al., 2006; Focht, Rejeski, Ambrosius, Katula, & Messier, 2005). Yet others have investigated whether self-efficacy influences functional decline levels in the face of diminished physical capacity (Mendes de Leon et al., 1996), self-reported ratings of task difficulty and perceived ability (Rejeski, Craven, Ettinger, McFarlane, & Shumaker, 1996), physical performance (Maly, Costigan, & Olney, 2005, 2006b), and the outcomes of physical activity programs for people with osteoarthritis of the knee (Rejeski, Ettinger, Martin, & Morgan, 1998) and symptomatic responses to glucosamine (Bennett et al., 2007).

The present cross-sectional analysis expands upon the studies mentioned here and examines whether there is any basis for believing that men and women with varying degrees of symptomatic knee osteoarthritis, who have not undergone surgery, can potentially achieve more positive health outcomes by being exposed to individually tailored self-efficacy enhancing programs. To this end, this report specifically details the relationship—in people with moderate levels of knee osteoarthritis—between key osteoarthritis-related outcome variables, on the one hand, and measures of pain and other-symptoms self-efficacy, on the other, an area poorly addressed in the current literature. It also reports some individual variations that occur in the expression of this psychological construct that may warrant future consideration.

Given that low self-efficacy may seriously affect the ability to adhere to prescribed self-management activities among people with knee osteoarthritis (Fitzgerald, 2005), it was hoped that the study would demonstrate that both pain and symptom management self-efficacy are likely to be important explanatory variables of the physical, as well as the psychological, status of people with moderate levels of knee osteoarthritis. It was hypothesized that a better understanding of the variation in self-efficacy perceptions concerning pain and the management of common symptoms of knee osteoarthritis disability could be especially helpful for guiding future intervention directives and for improving the long-term outcomes and life quality of this patient group.

Methods

To evaluate whether pain and other-symptoms management self-efficacy beliefs are potential explanatory variables of key knee-joint-osteoarthritis–related outcomes, the relationship between several common outcome variables and the self-efficacy scores reported by a cohort of 100 community-recruited urban-dwelling North American adults with either unilateral or bilateral knee osteoarthritis, as confirmed clinically and radiographically, were assessed. All 100 adults were deemed eligible to participate in an outpatient-based exercise study that received ethics approval from a local hospital board, and all agreed to undergo baseline testing before being allocated into the study arms.

The specific variables assessed were age, gender, number of co-morbidities, number of affected joints, body mass index, 6-minute walking distance, perceived exertion following the walking test, fast- and slow-paced walking velocity, pain, depression, and pain and other-symptoms management self-efficacy scores. All survey instruments and measurement methods were based on standard approaches used

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in arthritis studies and deemed to be reliable and valid indicators of the physical and mental health status of people with knee joint osteoarthritis.

These included body mass indices as calculated from the subjects' height and weight data; knee pain intensity over the previous week assessed using a 10 cm-wide visual analogue (VAS) pain scale, ranging from minimal pain to maximal pain; overall pain as measured by the Arthritis Impact Measurement Scale (AIMS); depression as assessed using the summary score for the 20 items listed on the Centre for Epidemiologic Studies Depression Scale (CES-D); and self-efficacy as measured using the Lorig et al. (1989) self-efficacy subscales for controlling arthritis pain (five items) and other symptoms (six items) as located on a 0–100 mm scale, ranging from *very uncertain* to *very certain* and summing these item scores and domains separately. The functional domain of this questionnaire was not used because most of the nine questions relate to hand function and subjects were knee osteoarthritis cases. Walking speed and distance walked at self-paced speed on a level indoor walkway with or without devices were assessed using an electronic timing device and floor markers for walk-way distance elements.

All measurements were conducted by experienced personnel in a standardized manner on a single occasion, which lasted approximately 3 hours. After all the data on an individual had been collected, the records were systematically transposed from the individual's assessment sheets onto an Excel spreadsheet. When data for all subjects had been entered into the spreadsheet, these were analysed using SPSS, version 10.00, and included standard descriptive statistics, bivariate analyses to describe the strength of the relationships of interest, and multiple regression to examine the relative strength of significant correlations identified in the univariate analyses.

Results

The cohort included 82 women (mean age 70.1 ± 9.6 years) and 18 men (mean age 67.9 ± 12.5 years) with either unilateral ($n = 57$) or bilateral knee joint osteoarthritis ($n = 43$). Thirty-nine cases had no co-morbid disease history, 43 had one co-morbid disease, 13 had two co-morbid diseases, and 5 had three or more co-morbid diseases. The average age of the cohort was 69.7 ± 10.1 years, and their average body mass index (weight/height^2) was 29.4 ± 5.6, indicating that the majority were overweight.

The average self-paced walking distance achieved in 6 min by the group was 370.65 ± 121.24 m, fast- and slow-paced walking velocities were 52.85 ± 15.34 and 48.40 ± 14.83 m/min^{-1} and average perceived exertion scores for the distance walking test were 12.06 ± 2.06.

Average pain scores on the AIMS and VAS were 5.04 ± 2.2 and 4.92 ± 2.96. CES-D scores were 12.32 ± 10.18, and based on these scores, 47 had no depression, 27 had mild depression, 14 had moderate depression, and 12 had severe depression.

Mean self-efficacy scores for pain were 69.54 ± 18.98 and for other-symptoms management they were

Table 1: Lorig et al. self-efficacy item questions for pain and other self-efficacy and mean scores obtained by a random sample of 40 subjects with unilateral and bilateral knee osteoarthritis, mean age 67.38 ± 12.5 years

Questionnaire Item	Mean Score & *SD*
Pain Self-efficacy	
How certain are you that you can decrease your pain quite a bit?	64.5 ± 29.3
How certain are you that you can continue most of your daily activities?	69.5 ± 25.5
How certain are you that you can keep arthritis pain from interfering with your sleep?	68.5 ± 27.4
How certain are you that you can make a small-to-moderate reduction in your arthritis pain by methods other than medication?	73.6 ± 26.5
How certain are you that you can make a large reduction in your arthritis pain by using methods other than taking extra medication?	68.4 ± 28.9
Mean	**68.45 ± 19.4**
Other Symptoms	
How certain are you that you can control fatigue?	78.3 ± 24.2
How certain are you that you can regulate your activity so as to be active without aggravating your arthritis?	74.0 ± 28.3
How certain are you that you can do something to help yourself feel better if you are feeling blue?	75.5 ± 27.5
As compared to other people with arthritis like yours, how certain are you that you can manage arthritis pain during activities?	77.5 ± 21.2
How certain are you that you can manage your arthritis symptoms so that you can do the things you enjoy doing?	72.0 ± 26.7
How certain are you that you can deal with the frustration of arthritis?	72.5 ± 28.6
Mean	**74.88 ± 20.7**

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71.00 ± 21.65, indicating subjects studied were slightly less confident in their ability to manage pain than in their ability to manage other symptoms of knee osteoarthritis, such as fatigue (an example of these questions and variation in responses to these is shown in Table 1).

Overall, men had pain self-efficacy scores (68.78 ± 15.87) and women had slightly higher numerical scores (69.71 ± 19.67), but these were not significantly different ($p = 0.852$). Men, however, had slightly higher numerical scores for other-symptoms self-efficacy (73.63 ± 18.19 vs. 70.42 ± 22.40 for the women), but again this difference was non-significant ($p = 0.572$). Pain self-efficacy and other-symptoms self-efficacy scores were lower for the cases with unilateral knee joint osteoarthritis (see Figure 1), but as a whole, these were not significantly different, with

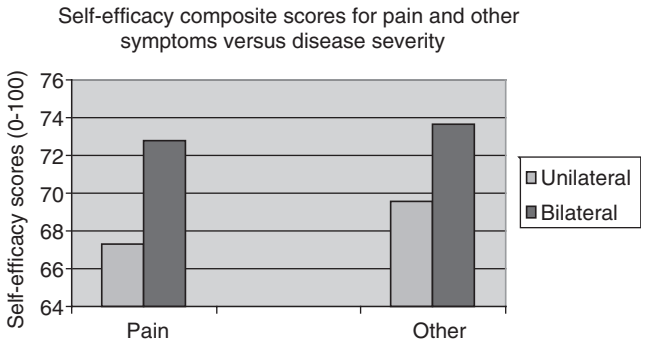

Figure 1: Figure showing that overall levels of self-efficacy (as recorded by the Lorig et al. [1989] self-efficacy constructs for pain and other symptoms management) vary in magnitude by disease status and according to the construct assessed to some degree (*N* = 100)

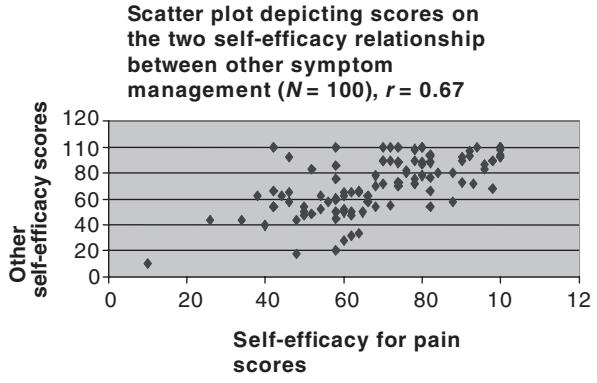

Figure 2: Figure showing a positive correlation between the composite scores on the Lorig et al. Self-efficacy scales for pain and other symptom management, suggesting those patients who are not confident in one domain are not confident in other self-management-related domains.

p values of 0.236 and 0.378, respectively. The overall scores of the pain and symptom management self-efficacy constructs were significantly correlated ($r = 0.667$; $p = 0.000$), albeit imperfectly (see Figure 2).

Step-wise multiple regression analyses weighted by age and used to examine the relative impact of the significant independent study variables (AIMS pain score, VAS score, Pain SE, Other SE) on perceived self-reported exertion at the end of a 6-minute self-paced walk test (with the dependent variable of fast walking velocity, deemed an objective test of function) showed self-efficacy for managing osteoarthritis symptoms other than pain was the only predictor of perceived exertion and accounted for 9.1 per cent of the variance in perceived exertion ($R^2 = 0.091$). The standardized beta estimate (ß) for the relationship between other-symptoms self-efficacy scores and perceived exertion scores was −0.301 ($p = 0.002$). The standardized beta estimates for the relationship between fast walking velocity and the variables other-symptoms self-efficacy and pain intensity were 0.319 ($p = 0.001$) and −0.194 ($p = 0.049$), respectively. However, as self-efficacy for managing other symptoms increased, walking speed increased and perceived exertion decreased (see Figures 3 and 4). For pain intensity assessed on the VAS, pain self-efficacy was a stronger

Figure 3: Regression analysis of self-efficacy scores for managing other symptoms and self-reported perceived exertion on walking for a 6-min. period. As shown, as self-efficacy increased, perceived exertion decreased; however, this ability to feel confident about managing symptoms other than pain was clearly not a major factor in explaining perceived exertion among the present cohort.

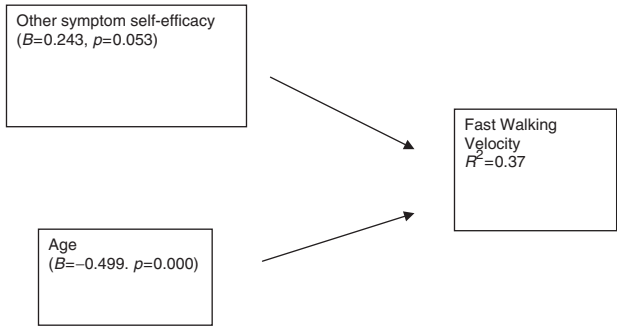

Figure 4: Regression analysis summary of other symptom self-efficacy scores and age that account for approximately 40 per cent of the variance associated with the performance of fast walking. As shown, as self-efficacy increased as fast walking velocity increased, but fast walking velocity decreased with increasing age.

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Table 2: Summary of the key Pearson correlation coefficients (*r*) for selected demographic, physical, and psychological correlates (*n* = 100)

			Pain			Function			Self-efficacy	
Variable	**Age**	**BMI**	**VAS**	**AIMS**	**CESD**	**FVel**	**6 min**	**PercEx**	**Pain**	**Other**
Age	1	−0.56**	−0.122	−0.175	−0.007	−0.39**	−0.41**	0.033	0.02	−0.03
BMI		1	0.27**	0.36**	0.09	−0.01	0.03	0.02	−0.09	−0.09
Pain										
VAS			1	0.64**	0.24*	−0.25*	−0.21*	0.24*	−0.29**	−0.20*
AIMS				1	0.19	−0.23*	−0.14	0.25*		
CESD					1	−0.14	−0.09	0.10	−0.46**	−0.54**
Function										
Fvel						1	0.75**	−0.28**	0.19	0.31**
6 min							1	−0.08	0.13	0.16
PercEx								1	−0.29**	−0.31**
Self-efficacy										
Pain									1	0.67**
Other symptoms										1

AIMS = Arthritis Impact Measurement Scale; BMI = body mass index; CESD = Centers for Epidemiologic Studies Depression Scale; FVel = fast walking velocity; PercEx = perceived exertion on Borg Exertion Scale; min = minutes
* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed)

Table 3: Summary of selected univariate correlations (*r*) of interest (*n* = 100)

	Borg score	**VAS score**	**AIMS Score**	**CESD**	**Fast Walking Vel**
SE pain					
r	−0.294	−0.286	−0.299	−0.463	0.187
p	0.003	0.004	0.002	0.000	0.062
SE other symptoms					
r	−0.308	−0.201	−0.293	−0.536	0.312
p	0.002	0.045	0.003	0.000	0.002

AIMS = Arthritis Impact Measurement Pain SubsScale; Borg score = perceived exertion score; CESD = Centers for Epidemiological Studies Depression Scale; SE = self-efficacy; walk = walking; VAS = visual analogue pain score; Vel = velocity

predictor of this score than was body mass index (ß = −0.291; $p = 0.003$ and ß = 0.222; $p = 0.021$, respectively). For the AIMS pain score, these estimates were ß = −0.335 ($p = 0.001$) for pain self-efficacy and ß = 0.306 ($p = 0.001$) for body mass index.

Important Pearson correlations that were entered into the regression models and their significance levels identified among the variables are shown in Tables 2 and 3.

Discussion

Knee osteoarthritis is a highly disabling condition that may be affected by a variety of factors, such as anxiety, poor psychological adjustment due to fear, lack of confidence in one's ability to prevail, and poor pain coping skills. Other factors include depression, fatigue, muscle weakness, and poor or reduced aerobic capacity. Being overweight, having a higher age, and having a co-morbid condition can also detrimentally affect health outcomes for those with this condition.

In this present cross-sectional analysis, the patients studied had modest pain levels, and most reported some degree of depression. Yet, even though their pain levels were not as severe as they might be and all subjects were living independently in the community, both men and women reported that they were not completely confident they could control their pain or carry out activities to manage other arthritis-related symptoms successfully in all cases. Indeed, regardless of whether one or both joints were affected, the strongest predictor of fast walking speed, a valid indicator and predictor of function, was the confidence patients reported with respect to symptomatic control of pain-related situations and depression and fatigue. Perceived exertion, which was inversely correlated with fast walking velocity ($r = -0.286$; $p = 0.004$) was also related negatively to the self-efficacy beliefs of the individual, as well as to pain on the VAS ($p = 0.012$) and AIMS ($p = 0.008$). Though this was a cohort who were generally overweight, perceived exertion during walking was not related to being overweight ($r = 0.012$; $p = 0.905$). Finally, depression and the magnitude of the individual's self-efficacy for pain and other-symptom management

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were related, as were pain and pain self-efficacy status, regardless of whether pain was assessed as pain intensity or on the AIMS pain scale.

No cause–effect relationship could be established in this study. As was observed by Arnstein (2000) for people with chronic pain and by Sharma et al. (2003) for people with knee osteoarthritis, the present results suggest that self-efficacy, a psychological construct denoting the confidence one has to perform a task or specific behaviour or change a specific cognitive state successfully, regardless of circumstances or contexts (Bandura, 1986), is a variable that may be contributing to the levels of pain, depression, and disability experienced by people with knee osteoarthritis. This was also the observation of Maly, Costgan, and Olney (2006a).

Thus, even though it is essential to treat the symptoms of pain and depression associated with knee osteoarthritis directly, and this should not be neglected, it may be helpful, in addition, specifically to evaluate and bolster the patient's belief in her/his ability to control her/his pain and other symptoms, as indicated. This perspective may also affect depression and disability quite favourably, as Arnstein et al. (1999) found in the case of chronic pain patients. It may also affect the subject's belief in her/his ability to exercise or carry out daily activities, thereby helping her/him not only to remain functional but to achieve or maintain a normal body weight, a key factor mediating knee osteoarthritis pain.

This is supported by observations that higher pain self-efficacy beliefs are predictive of reduced levels of avoidance behaviours over an extended period (Asgari & Nicholas, 2001) and may have a positive impact upon the ability to get down to and rise up off the floor and ascend/descend stairs in adults with knee osteoarthritis (Rejeski, Miller, Foy, Messier, & Rapp, 2001; Topp, Woolley, Khuder, Hornyak, & Bruss, 2000).

Furthermore, a number of corelational studies indicate that high self-efficacy levels are statistically significant predictors of better arthritis-related outcomes, such as the ability to manage pain, carry out daily activities, control stress and fatigue, and mobilize the social network (e.g., Arnstein et al., 1999; Lefebre et al., 1999; Riesma et al., 1998). Among arthritis patients, high self-efficacy levels also predict better psychological functioning (Penninx et al., 1997; Venohr, 1994), higher levels of attendance at and participation in health interventions, better adherence to health recommendations (Brus, van de Laar, Taal, Rasker, & Wiegman, 1997; Taal, Rasker, Seydel, & Wiegman, 1993), and higher levels of self-efficacy for exercise (Baker et al., 2001).

Similarly, higher levels of confidence in one's ability to manage other knee osteoarthritis symptoms as well as pain predict walking ability to some degree. Commonly advocated interventions for improving function and life quality in people with knee osteoarthritis can be quite complex because they often include aerobic, range-of-motion, stretching, and strengthening exercises; joint protection techniques; weight control; and patient education aimed at self-management and designed to improve coping skills. Thus initial efforts to maximize a patient's confidence that s/he can carry out these strategies may prove beneficial. Moreover, based on the observation that higher levels of knee pain are related to a poor functional outcome (Sharma et al., 2003) and can affect depressive symptoms directly (Bookwala, Harralson, & Parmelee, 2003), efforts to maximize a patient's self-efficacy to control pain would seem highly desirable for men and women with knee osteoarthritis. Since this may not be necessary for all subjects across all item domains listed in Lorig et al.'s (1989) Arthritis Self-Efficacy Scale, and since self-efficacy is behaviour-specific, an analysis of both the item scores for individuals as well as the mean total score achieved may indicate where specific improvements need to be made. The consistent use of Lorig et al.'s scale as a standard assessment tool for physicians or therapists would be very helpful in this context.

Conclusions

Although no causal inferences can be gleaned from the current results due to the nature of the study design, the limited sample, and the use of self-reports, as depicted in Figure 5, the present findings suggest that it is plausible to hypothesize that efforts aimed at enhancing self-efficacy for pain control and other-symptoms management, which are commonly compromised in this patient population, would yield several health-related benefits. Moreover, heightening the perceived self-efficacy beliefs of those with an initial diagnosis of unilateral knee osteoarthritis may be beneficial if it can help to encourage better adherence to exercise and dietary regimens early on, rather than later on, when the disease may be more widespread. Efforts to establish a patient's confidence level for self-care practices at the outset seem indicated because self-efficacy beliefs can influence mood and attitude as well as behavioural outcomes. Because self-efficacy profiles may differ within self-efficacy domains on the Lorig et al. (1989) Arthritis Self-Efficacy Scale, as well as across patients, a detailed analysis of an individual's self-efficacy profile, including the first three questions of the arthritis self-efficacy function subscale, may

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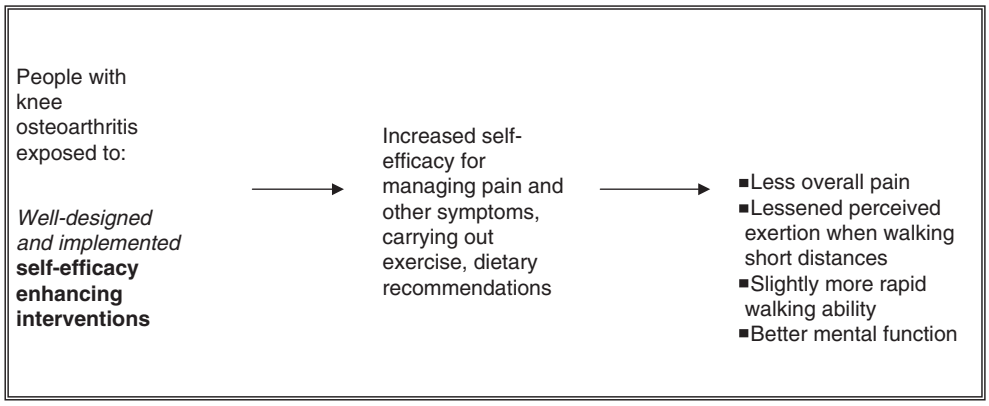

Note:
Unilateral cases: May need more attention than bilateral cases
Males: May warrant more attention than females
Individual variation and variation between different self-efficacy constructs should be carefully assessed

Figure 5: Hypothetical model of impact of self-efficacy enhancing interventions for people with knee osteoarthritis.

facilitate better targeting and tailoring of health related recommendations by the consulting care provider.

This assessment process need not be very time consuming and, if monitored over time, may help to identify one reason for lack of progress in a patient's self-management ability and suggest what interventions may yield better outcomes. Strategies that can help patients be more confident about their ability to control their pain and other symptoms can conceivably affect positively the degree of depression commonly experienced by adults with knee osteoarthritis, thus reducing the overall negative impact of the disease. As with other chronic diseases, the optimal implementation of simple self-efficacy–enhancing strategies may specifically enable aging individuals with knee osteoarthritis to undertake successfully those self-care activities and prescribed interventions deemed essential for maintaining their physical and mental well-being, such as exercise and weight reduction or control and stress management. Unlike medications and surgery, which may be costly because they can be associated with varying monetary costs and often one or more health risks, confidence-building strategies are likely to be quite straightforward, with no major costs accruing to patients.

These strategies may include imparting a more positive outlook to patients, so they feel confident that they can actively maximize their own well-being; offering consistent verbal encouragement; allaying patients' anxiety; and helping them to visualize success, despite having disabling knee arthritis. There are also few known risks associated with adhering to or attempting to carry out strategies designed to enhance self-efficacy for relevant behaviours, such as peer support, the use of successful role models, patient-friendly educational materials, and telephone support.

The ultimate benefit is that adults exhibiting higher self-efficacy scores for arthritis pain control and function are also expected to have significantly higher pain thresholds than do lower-scoring subjects, a better life quality, and possibly fewer problems with mobility and suffering, as suggested by Marks (2001). They are likely to adopt and maintain favourable health behaviours due to their heightened personal perceptions of their ability to carry out any particular task. They are also likely to be less anxious, experience less helplessness (Creamer, Lethbridge-Cejku, & Hochberg, 2000), and have better short-term functional outcomes (Sharma et al., 2003).

Well-designed clinical trials to test some of these ideas could thus demonstrate that the construct of self-efficacy is an important, often-overlooked intervention perspective that could markedly bolster the well-being of aging adults with knee osteoarthritis, who often believe nothing can be done to help them, and is consequently an important patient self-management strategy. As outlined by Gaines et al. (2002), examining possible differences in self-efficacy among men and women with knee osteoarthritis may prove fruitful, as may the examination of self-efficacy levels in relation to the progression of the disease.

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