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# Pain and disability in a group of Chinese elderly out-patients in Hong Kong

## 研究香港華裔老年門診病人痛症和殘障的情況

**Objective.** To investigate the relationship between musculoskeletal pain and disability among a group of geriatric out-patients.

**Design.** Consecutive case series.

**Setting.** Regional hospital, Hong Kong.

**Participants.** Attendees at a geriatric specialist out-patient clinic from October 2002 to February 2003.

**Main outcome measures.** Pain duration, location, intensity, and frequency; use of analgesics; ability to identify the cause of pain; disability (Barthel index) and Lawton Instrumental Activities of Daily Living scale score; depressive symptoms (Geriatric Depression Scale score); and self-reported sleep quality.

**Results.** Of the 749 respondents, 461 (61.5%) had experienced pain in the previous 2 weeks. Among these patients, 51.3% had received a pain-relieving drug. Compared with men, women reported a higher pain intensity (5.87 versus 5.26;  $P=0.001$ ), had a lower Barthel index (96.0 versus 97.9;  $P=0.005$ ), and had a lower score on the Lawton Instrumental Activities of Daily Living scale (42.19 versus 44.52;  $P=0.008$ ). Multivariate logistic regression showed that the presence of pain was associated with female sex (odds ratio=2.25), poor self-rated health (0.69), and depression (1.54).

**Conclusion.** Pain is a common problem among the elderly population, but it is not associated with physical disability, and only half of the patients received analgesics. The study provides information for health care workers to develop strategies to better assess and manage pain problems among elderly people.

**目的：**調查一群老年門診病人肌肉骨骼痛症與殘障之間的關係。

**設計：**連續病例。

**安排：**分區醫院，香港。

**參與者：**2002年10月至2003年2月期間，到一所醫院老人科門診部求診的病人。

**主要結果測量：**疼痛持續的時間、部位、程度和出現的頻率，鎮痛劑的使用，確定疼痛成因的能力，殘障情況（以巴氏量表評定）以及羅頓日常生活獨立活動力量表得分，抑鬱症的症狀（老年人抑鬱症量表得分），睡眠質量的自我評估。

**結果：**在749名回應的病人中，有461名（61.5%）在剛過去兩星期身體曾經出現疼痛，當中又有51.3%曾經服用止痛藥。與男性比較，女性的疼痛程度比較嚴重（5.87比5.26； $P=0.001$ ），巴氏量表的得分較低（96.0比97.9； $P=0.005$ ），日常生活獨立活動力量量表的得分也較低（42.19比44.52； $P=0.008$ ）。多元邏輯回歸分析結果顯示，痛症的出現與女性（比數比為2.25）、自我評估健康不佳（0.69）以及抑鬱（1.54）相關。

**結論：**痛症是老年人常有的毛病，但和身體殘障無關，本研究中只有半數病人服用鎮痛劑。本研究所提供的資料，有利於醫護保健人員制訂政策，以求更準確地評估老年人痛症的情況，以及更有效地處理他們的問題。

### Introduction

In 2001, the proportion of senior citizens in the community aged 65 or older was about 11%. The Hong Kong Census and Statistical Department has predicted that this proportion will increase to 24% by the year 2030.<sup>1</sup> In Hong Kong, the mean life expectancy of elderly people has also increased—from 83 to 84 years for females and 77 to 78 for males during the year of 1998 to 2003.<sup>1</sup> As a result of the ageing population, physicians will be treating more older adults in the future.

### Key words:

Aged;

Disability evaluation;

Musculoskeletal diseases;

Pain;

Sex factors

### 關鍵詞：

年老；

殘障的評估；

肌肉骨骼的疾病；

痛症；

性別因素

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Pain is an important complaint among elderly people. Increasing age is associated with a decline in musculoskeletal properties that result not only in pain or discomfort, but also in decreased physical function.<sup>2,3</sup> Chronic conditions, including different forms of arthritis and other musculoskeletal problems, are prevalent in elderly populations and frequently associated with joint degenerative pain, stiffness, and loss of function.<sup>2,3</sup> Several epidemiological studies have shown that the prevalence rates of both musculoskeletal pain<sup>4,5</sup> and physical disability<sup>5-7</sup> are higher in older than in younger populations. The overall prevalence of any type of pain or discomfort in the elderly population has been estimated to range from 10% to 71%.<sup>4-10</sup>

Disability is defined by the World Health Organization as "Any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being."<sup>11</sup> The estimated prevalence of physical disability ranges from 5% to 90%.<sup>6,7</sup> A review article showed that the main cause of disability and dependence and assistance in activities of daily living (excluding stroke) in the elderly population were fracture due to falls and to osteoporosis; osteoarthritis of the hip, knee, and lumbar spine; painful feet; and chronic and intractable rheumatoid arthritis.<sup>12</sup> Management of musculoskeletal diseases in elderly people aims at preventing disability or a further increase in disability (if some level of disability already exists). The ability to perform activities of daily living is necessary for independent community living.

Knowledge of the health status of senior citizens is important. Not all of this population have pain or physical disabilities. Factors that have been shown to be related to disability include the number of chronic conditions, an individual's age and sex, and depression.<sup>5,13,14</sup> Although the association between pain and disability is unclear, pain is known to be a factor that propels individuals to seek medical attention.<sup>5</sup> Pain as a co-morbidity also affects elderly patients' autonomy and independence. Given the rising costs of health care, efforts to prevent disabling pain and to facilitate the development of strategies conducive to the management and control of pain among elderly people are paramount. This study assesses the relationship between pain and functional disability among an elderly group of Chinese patients in Hong Kong.

## Methods

We studied a consecutive sample of elderly Chinese people attending the geriatric out-patient clinic of the Kwong Wah Hospital in Hong Kong between 1 October 2002 and 1 February 2003. Inclusion criteria included the age of 65 years or above, satisfactory mental state with an abbreviated mental test (AMT) score of more than 6 in 10, and an ability to understand Cantonese. Data were collected via a standardised questionnaire. We estimated that approximately 35% of the study participants had

chronic pain. For a power of 0.8 and an expected error within 10%, we calculated that a total of 740 participants were needed for the study.

We collected basic demographic data, the AMT score, the Barthel index (as a measure of physical disability), and Lawton Instrumental Activities of Daily Living (IADL) scale score. The pain status was determined by asking respondents whether they had been troubled by pain in their joints, muscles, or bones in the previous 2 weeks.<sup>15</sup> The location of pain was identified by asking respondents to locate their site of pain and to identify the affected area on a predrawn figure. The severity of pain was measured on a 10-point visual analogue scale, and the frequency of pain was described as always present, present more than 50% of the time, present 30% to 50% of the time, or present less than 30% of the time. The duration of pain was measured in terms of years, months, and days. The type and number of analgesics taken were also recorded, as were the number of medical conditions at the time of pain experience and at presentation and co-morbidities.

Depressive symptoms were measured in terms of the Geriatric Depression Scale (GDS) score; depression was defined as a score of more than 8. Sleep quality in the previous 2 weeks was assessed on a visual analogue scale of 0 to 10. The health status was self-rated on an ordinal scale of very good, good, fair, and poor. Income adequacy was assessed on an ordinal scale of enough, just enough, not enough, and the use of comprehensive social security assistance. Education level and marital status were also recorded.

Student's *t* test was used to analyse data for continuous variables and the Chi squared test for categorical data. The Mann-Whitney *U* test was used to compare the Barthel index and IADL score for various subgroups. A *P* value of less than 0.05 was considered statistically significant. We also conducted a multiple logistic regression that included independent variables that were statistically significant in the bivariate analyses, treating the presence of pain as the dependent variable. Data were analysed with the Statistical Package for Social Science version 9.0 (SPSS Inc, Chicago, US).

## Results

A total of 749 elderly people were successfully interviewed: 364 (48.6%) men and 385 (51.4%) women. The mean age was 75.2 years (standard deviation [SD], 6.57 years). A total of 461 (61.5%) of the participants reported having had pain in the previous 2 weeks. The most common co-morbid conditions were diabetes mellitus (28.8%), ischaemic heart disease (21.7%), and osteoarthritis (16.3%). Nearly two thirds (66.4%) of the participants graded their financial status as just enough for living and 20.4% of them said their financial situation was not adequate for living. Among those who gave a history of pain, 237 (51.4%) had

**Table 1. Bivariate analysis of pain status for selected characteristics**

	Pain		P value
	Yes (n=461)*	No (n=288)*	
Age (years)	75.0	75.3	0.939
Sex	59.9% female 40.1% male	37.8% female 62.2% male	<0.001
Sleep quality score	5.94	7.05	<0.001
Self-rated health status			
Very good	37.8%	62.2%	
Good	52.8%	47.2%	
Fair	64.4%	35.6%	
Poor	74.4%	25.6%	<0.001
Barthel index	96.4 (9.1)	97.7 (9.6)	<0.001
Instrumental Activities of Daily Living scale score	42.6 (10.5)	44.5 (8.1)	0.014
Geriatric Depression Scale (GDS) score	5.2 (3.8)	3.8 (3.4)	<0.001
% Depressed (GDS>8)	73.3%	58.3%	0.001
Use of walking aids	72.1%	57%	<0.001

\* Standard deviation is shown in brackets

**Table 2. Sex differences in physical performance and pain**

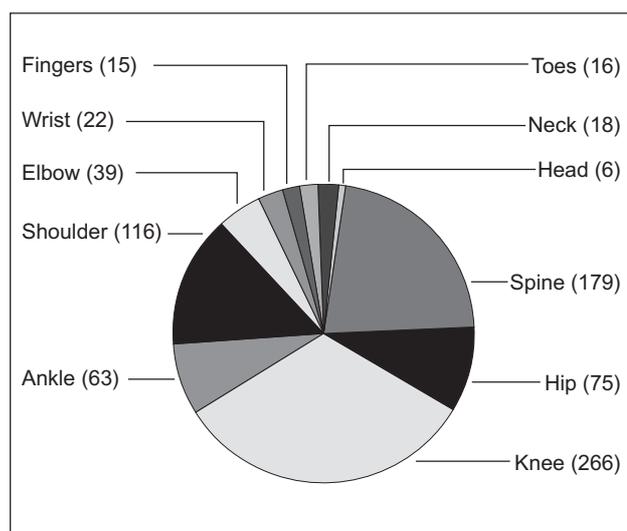
	Male (n=185)*	Female (n=276)*	Total*	P value
No. of painful site	2.46 (1.57)	2.79 (2.84)	2.66 (2.42)	0.115
No. of pain-relieving drugs	1.1 (0.37)	1.15 (0.54)	1.13 (0.49)	0.386
Duration of pain [years]	5.24 (6.16)	6.3 (7.1)	5.87 (6.76)	0.099
Intensity of pain	5.26 (2.37)	5.87 (6.67)	5.68 (2.35)	0.001
Barthel index	97.9	96.0	96.93 (9.3)	0.005
Instrumental Activities of Daily Living scale score	44.52	42.19	43.32 (9.69)	0.008
Geriatric Depression Scale score	4.41	4.84	4.63 (3.72)	0.109

\* Standard deviation is shown in brackets

received a pain-relieving drug. The mean number of such drugs was 1.13 (SD, 0.49) and included analgesic balm (35%), Dologesics (53%), non-steroidal anti-inflammatory drugs (18%), and paracetamol (10.5%). The mean number of pain sites was 2.66 (SD, 2.42), and the mean duration of pain was 5.87 (SD, 6.76) years. The mean self-rated pain intensity was 5.68 (SD, 2.35).

There was no statistically significant difference between men and women, regarding the number of painful sites (2.46 versus 2.79;  $P=0.56$ ) or number of pain-relieving medications (1.1 versus 1.15;  $P=0.386$ ). Older age was negatively correlated with Barthel index ( $r= -0.165$ ;  $P<0.001$ ) and IADL score ( $r= -0.24$ ;  $P<0.001$ ), and it was positively correlated with the GDS score ( $r=0.12$ ;  $P=0.001$ ). Pain intensity was negatively correlated with sleep quality ( $r= -0.18$ ;  $P<0.001$ ), but it was not related to the Barthel index, IADL score, or GDS score. Approximately 19.6% of the respondents reported having pain all the time, 10.0% reported pain more than 50% of time, 25.4% had pain 30% to 50% of time, and 45.0% had pain less than 30% of the time. Approximately one half (53.8%) of the respondents were able to identify the cause of their pain. Depression was present in 154 (20.6%) of cases. The Figure shows the location of pain and Table 1 shows the results of bivariate analysis for potential confounding factors. Patients with pain were more likely than those without pain to be women, have poorer sleep quality, poorer self-rated health status, lower IADL score, and more depressed. There was a difference

between men and women with respect to pain intensity, Barthel index, and IADL score (Table 2). Women tended to physically perform more poorly and to report more severe pain than men.



\* Number of subjects who reported pain in the corresponding body parts is indicated in brackets. Patients may have more than one part of reported pain

**Fig. Distribution of pain, by reported location in the body\***

**Table 3. Multivariate logistic regression for variables associated with the presence of pain**

	$\beta$	SE	Odds ratio	95% CI	P value
Sex (female versus male)	0.814	0.158	2.25	1.65-3.08	<0.001
Self-rated health status	-0.372	0.105	0.69	0.56-0.85	<0.001
Presence of depression (yes versus no)	0.437	0.218	1.54	1.01-2.31	0.047
Constant	0.643				

Sleep quality was correlated with pain intensity ( $r = -0.181$ ;  $P < 0.001$ ), but not with the number of painful sites ( $r = -0.073$ ;  $P = 0.118$ ) or the duration of pain ( $r = -0.052$ ;  $P = 0.266$ ). However, the duration of pain was not correlated with the Barthel index, IADL score, or GDS score. In a multivariate logistic regression, female sex (odds ratio [OR]=2.25; 95% confidence interval [CI], 1.65-3.08), the presence of depression (OR=1.54; 95% CI, 1.01-2.31), and self-rated health status (OR=0.69; 95% CI, 0.56-0.85) were independently associated with musculoskeletal pain. The model explained 63.6% of the variance (Table 3). There was no significant difference between the groups with and without pain regarding disability as reflected by the Barthel index and IADL score, after adjustment had been made for confounding factors.

## Discussion

This study demonstrated that the prevalence of self-reported pain in Chinese elderly out-patients was 61.5%, which is comparable to reported estimates of prevalence rates of musculoskeletal pain among people aged 65 years or older (10%-71%).<sup>4,10,15,16</sup> In our study, the prevalence of musculoskeletal pain was greater among women; the most common location of pain was the knee, followed by the lower back and shoulder.

### *Pain and disability*

In bivariate analysis, pain was associated with physical disability, as reflected by a reduced mean Barthel index and IADL score. Nevertheless, after adjustment for confounding factors, such as depressive symptomatology, age, and sleep quality, the association becomes insignificant. Pain, secondary to pathological changes in joints, is the primary factor that limits function, according to Moskowitz.<sup>17</sup> Pain alone, however, is not sufficient to explain functional limitation in individuals with osteoarthritis.<sup>18</sup> Guccione et al<sup>19</sup> showed that functional deficits are more likely in older subjects with severe radiographic osteoarthritis but with fewer painful symptoms, than in individuals with milder radiographic changes but more symptoms.

Pain and disability are not synonymous. Participants in our study who were troubled by pain did not differ significantly from those who were not troubled by pain on measures of disability. Similarly, Ross and Crook<sup>20</sup> found no significant difference between groups who experience pain and no pain in disability, as determined from the activities of daily living and IADL section of the Older

American Resources and Services Multidimensional Functional Assessment questionnaire. The author postulated that besides pain, other factors also contribute to decreased performance in physical activities—for example, sleep disturbance, depression, and poor self-rated health. All these factors are interrelated.

The associations between pain and depression, sleep quality, female sex, and self-rated health were consistent with findings from previous studies that examined factors associated with physical disability.<sup>7</sup> Although no specific diagnosis of pain was made in our study, joint pain was the most prevalent site of pain recorded. The association between pain and certain disabling disorders is expected, given the age of the respondents. Musculoskeletal disorders, such as osteoarthritis and connective tissue disorders, are major health problems in later life that are frequently associated with pain.<sup>21</sup> The mean pain intensity reported by participants in our study was 5.6 on a 10-point scale, which can be considered as moderate. This result is consistent with that of Mobily et al,<sup>22</sup> who found that the majority of respondents reported moderate-to-severe pain in multiple joints.

### *Pain and depression*

With respect to depressive symptomatology, respondents with pain in our study reported a higher level of depression (as evidence by a high GDS score) than did those without pain. The association between pain and depression is consistent with findings from other studies.<sup>20,23</sup> Furthermore, Magni et al<sup>24,25</sup> found that a significantly larger proportion of patients with chronic pain than of those without pain had depressive symptoms. They also found that the location of pain, particularly in the hip and in the back or neck, was a significant predictor of depressive symptoms. Many studies have demonstrated the direct relationship between the development of pain and the development of depression. Depression could precede the development of pain, depression could follow the development of pain, or depression could predispose an individual to the development of pain.<sup>26</sup> It is not known whether musculoskeletal pain causes depression in elderly people, or if depressed elderly people tend to have a lower threshold of tolerance to pain than those not depressed, and thus report painful symptoms more frequently.

Depression in the elderly population is related to disability: Herr and Mobily<sup>27</sup> found that elderly people with chronic pain and depression had significantly greater

disability than did those with chronic pain but no depression. Kuch et al<sup>28</sup> also found that depression is significantly correlated with physician-rated disability. The low mood of the patient may contribute more than the physical pain experienced to the poor performance in activities of daily living.

### ***Sleep impairment***

Our study found a positive association between pain intensity and sleep impairment. Participants with more severe pain subjectively experienced a greater sleep impairment than did others. This result is similar to those in studies by Ross and Crook<sup>20</sup> and by Scudds and McD Robertson.<sup>29</sup> The relationship between musculoskeletal pain and sleep disturbances is unclear. Disturbances in sleep can produce musculoskeletal symptoms similar to those of fibromyalgia in healthy individuals.<sup>30</sup> The presence of disabling pain can also lead to non-restorative sleep, which in turn may result in fatigue and increase pain intensity. McCracken and Iverson<sup>31</sup> have shown that greater sleep disturbance is associated with greater pain, disability, depression, and physical symptoms, as well as with fewer daytime hours awake. Further study is necessary to clarify the association between sleep quality and musculoskeletal pain.

### ***Pain-relieving drugs***

Although the prevalence of 61.5% of musculoskeletal pain is deemed high in our study population, only half of the affected individuals have received some form of pain-relieving drug treatment, such as topical analgesics and systemic drugs. The mean self-rated pain intensity was 5.68 on a 10-point visual analogue scale. Patients with moderate pain were undertreated. It is possible that this group of patients had a high tolerance to pain and hence did not require any pain relief, or clinicians were not aware of painful conditions in these elderly people and hence they tended not to prescribe any drugs for them.

### ***Female sex, physical performance, and pain***

Women tended to display poorer physical performance than men and to have more severe pain. Women also tended to be older than men (75.8 versus 74.4 years;  $P=0.03$ ). Because age plays an important part in physical performance and presence of depression, we postulate that the effect of female sex on disability and pain may be reflection of older age.

### ***Psychological component of pain***

In our study, the frequency of pain was not associated with physical disability. Patients who reported pain all the time or nearly all the time did not differ significantly from those who reported less frequent episodes of pain in terms of Barthel index and IADL score. Still, the effect of anxiety on, and the coping strategies of, individual subjects may be different. Moreover, reports of constant pain may reflect some cognitive or psychological aspect of pain experience.

Disability was shown to increase with age (for Barthel index,  $r=-0.165$ ;  $P<0.001$ , and for IADL score,  $r=-0.241$ ;  $P<0.001$ ). However, the duration of pain was not related to age or disability. Respondents who experience longer periods of pain may have altered and improved coping strategies to deal with the potential effects of physical disability.<sup>15</sup>

Analgesic therapy may be a factor in physical disability. Patients who were taking pain-relieving drugs had a lower Barthel index than those not taking any analgesics (95.7 versus 97.2;  $P=0.03$ ), as well as a lower IADL score (41.6 versus 43.6;  $P=0.056$ ) and a higher GDS score (5.53 versus 7.76;  $P=0.038$ ). Other factors apart from those strictly related to pain may have a role in this relationship. Experience with pain or the interpretation of pain may influence whether a person receiving treatment for pain copes with the pain and reports difficulty with certain activities. Another possible explanation is that those who took analgesics actually may have had higher pain scores than others, but these patients may have been diluted in the categorisation of pain intensity.

Finally, participants who used walking aids tended to report more pain than those not using walking aids. Hence, patients using walking aids may have experienced more pain and problems with daily activities. Further studies on the influence of musculoskeletal pain and walking aids should be done to clarify this finding.

### ***Limitations***

Some of the limitations of this study should be mentioned. The data were collected using a cross-sectional design; consequently, no causal relationship can be concluded from the results. Although associations were found between pain and depression, sleep quality, and self-rated health, these factors cannot be assumed to cause pain. Further research is required to investigate, in a prospective manner, the effect of pain on physical disability. An additional potential limitation is the use of self-reported health and pain status. With regard to the pain status, this should not be a problem, since pain is an individual experience and researchers rely on their patients' perception of pain. Assessing difficulty in daily activities, however, may be more problematic. Discrepancies between self-reports of functional ability and observations of function have been reported.<sup>32</sup> Patients tend to overstate their functional abilities.

The definition used for musculoskeletal pain assumed that respondents knew that their pain was due to muscle, joint, or bone problems. Consequently, pain with a neurological or vascular origin may have been misclassified as musculoskeletal pain. The design of this study did not permit specific diagnostic testing to determine the structure that was responsible of the reported pain. Finally, the assessment of pain severity using a visual analogue scale may not have been concise in quantifying pain intensity.

However, such scales are widely used in many studies and are easy to understand by individuals. A more detailed questionnaire, such as the McGill Pain Questionnaire<sup>33</sup> may be necessary for detailed analysis of pain severity.

## Conclusion

Pain is a common problem among the elderly population. Regardless of its origin, pain is associated with female sex, depressive symptoms, sleep disturbances, and poor self-rated health. It is not associated with physical disability. The relatively low rate of prescription of pain-relieving drugs among patients who reported pain may reflect a lack of attention of health care workers in the assessment and management of pain. This study provides health care professionals with information on the relationship between pain and various factors in elderly people, so that better assessment and management can be developed in the future to improve the quality of life among this population.

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