Prevalence of Low Back Pain among Physical Therapists in Kuwait

Dia Shehab^a Khalid Al-Jarallah^a Mohamed A.A. Moussa^b Nihad Adham^c

Departments of ^aMedicine and ^bCommunity Medicine, Faculty of Medicine, Kuwait University, and

^cMubarak Al-Kabeer Hospital, Kuwait

Key Words

Low back pain · Epidemiology · Prevalence · Physical therapist · Risk factors

Abstract

Objective: To determine the life and point prevalence rates and study the characteristics of work-related and non-work-related low back pain (LBP) among physical therapists in Kuwait and its effect on their regular activities. **Subjects and Methods:** A specially designed self-administered questionnaire was distributed to 143 physical therapists in Kuwait. The questionnaire included demographic data, history and characteristics of LBP before and after working as a physical therapist, the effect of LBP on regular activities and current LBP. A visual analogue scale was used to score the intensity of the pain. **Results:** One hundred (70%) of the 143 physical therapists completed the questionnaire; mean age and standard deviation of the respondents were 35.9 ± 8.45 years. The lifetime prevalence of work-related LBP was 70% (61.8% in males and 74.2% in females) and the point (current) prevalence rate was 57% (31.6% in males and 68.4% in females). All the 100 therapists were college graduates who worked full-time and 82% were employed in general hospitals and rehabilitation centers. The most common areas of specialty were orthopedics (32%) and neurology (23%). Fifty percent reported that LBP affected their regular activities, 28.6% reported limitation due to pain and 11.4% changed their work settings because of LBP. The main site of pain was at low back

and buttocks. Pain intensity was scored similarly among male and female physical therapists. **Conclusion:** Work-related and point prevalence rates of LBP among physical therapists in Kuwait are high and affect their daily activities, necessitating changes in work settings.

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Introduction

Lumbar pain, generally referred to as low back pain (LBP), is among the most common medical problems in the western industrialized countries. It has been estimated that 50–80% of the adult population suffer to a significant extent from LBP at some point in life [1–7]. In general, although back pain does not discriminate among gender, race or work environment, some professions are more susceptible than others to LBP [5, 8]. Physical therapists are among the susceptible groups due to frequent practice of lifting, bending, stooping, twisting, turning, prolonged sitting or standing [3, 9–12]. In Edmonton, Canada, Mierzejewski et al. [13] reported a high lifetime prevalence of LBP among physical therapists, 49.2% of which is work-related. In California, USA, Molumphy et al. [14] reported that 29% of physical therapists experienced work-related back pain and 58% of the initial episodes occurred during the first 4 years of working as a physical therapist.

No data have been reported about the prevalence of LBP among physical therapists in Kuwait. Hence we decided to undertake this study. The objective was to

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Dr. Dia Shehab, FRCPC, FACP
Department of Medicine
Faculty of Medicine, Kuwait University
PO Box 24923, Safat 13110 (Kuwait)
Tel. +965 5319596, Fax +965 5338907, E-Mail diaa@hsc.kuniv.edu.kw

Table 1. Age and professional experience of physical therapists (n, %)

	Work-related LBP			Non-work-related LBP			Total	
	M	F	subtotal	M	F	subtotal	M	F
<i>Age group, years</i>								
21–25	0 (0)	6 (12)	6 (9)	0 (0)	4 (24)	4 (13)	0 (0)	10 (15)
26–30	2 (10)	19 (39)	21 (30)	2 (15)	3 (18)	5 (17)	4 (12)	12 (18)
31–35	1 (5)	9 (18)	10 (14)	1 (8)	3 (18)	4 (13)	2 (6)	12 (18)
36–40	6 (28)	6 (12)	12 (17)	4 (31)	3 (18)	7 (23)	10 (29)	9 (14)
41–45	9 (43)	7 (14)	16 (23)	2 (15)	3 (18)	5 (17)	11 (32)	10 (15)
46–50	2 (10)	0 (0)	2 (3)	2 (15)	1 (6)	3 (10)	4 (12)	1 (1.5)
51–55	0 (0)	2 (4)	2 (3)	1 (8)	0 (0)	1 (3)	1 (3)	2 (3)
>55	1 (5)	0 (0)	1 (1.4)	1 (8)	0 (0)	1 (3)	2 (6)	0 (0)
<i>Current job duration, years</i>								
<5	3 (14)	18 (37)	21 (30)	2 (15)	7 (54)	9 (32)	5 (15)	25 (38)
5–9	2 (10)	19 (39)	21 (30)	6 (46)	2 (13)	8 (29)	8 (24)	21 (32)
10–14	3 (14)	5 (10)	8 (11)	0 (0)	2 (13)	2 (7)	3 (9)	7 (11)
15–19	8 (38)	4 (8)	12 (17)	3 (23)	2 (13)	5 (18)	11 (32)	6 (9)
>19	4 (19)	3 (6)	7 (10)	2 (15)	2 (13)	4 (14)	6 (18)	5 (8)
<i>Years of experience as a physical therapist</i>								
<10	3 (14)	29 (62)	32 (46)	4 (31)	6 (35)	10 (33)	7 (21)	35 (53)
10–19	8 (38)	13 (13)	21 (30)	4 (31)	6 (35)	10 (33)	12 (35)	19 (29)
>19	10 (48)	7 (14)	17 (24)	5 (38)	4 (24)	9 (30)	15 (44)	11 (17)
<i>Direct patient contact per week, hours</i>								
<10	1 (5)	0 (0)	1 (1.4)	1 (8)	0 (0)	1 (3)	2 (6)	0 (0)
10–19	1 (5)	1 (2)	2 (3)	0 (0)	0 (0)	0 (0)	1 (3)	1 (1.5)
20–29	9 (43)	20 (41)	29 (41)	0 (0)	2 (12)	2 (7)	9 (26)	22 (33)
30–39	6 (28)	18 (37)	24 (34)	9 (69)	8 (47)	17 (57)	15 (44)	26 (39)
>39	4 (19)	10 (21)	14 (20)	3 (23)	7 (41)	10 (33)	7 (21)	17 (26)

determine lifetime prevalence of work-related LBP and point prevalence among physical therapists in Kuwait, and to investigate the effect of LBP on their daily activities.

Subjects and Methods

A self-administered questionnaire (Appendix 1) was used for data collection. The questionnaire was piloted initially among 10 physical therapists and no major modifications were needed. The questionnaire included demographic data, history of LBP before and after working as a physical therapist, e.g. onset of pain or injury, duration of LBP episodes, work setting and effect of LBP on daily activities, limitations due to LBP, as well as the presence of current LBP and rating the intensity of LBP on a scale of 0 (no pain) to 10 (maximum pain) that represented a numerical system of 10 cm on a visual analogue scale.

The questionnaire was distributed to 143 physical therapists in different clinical settings: hospitals, clinics, schools and community care. Personal and professional characteristics were used to compare the experience of work-related and non-work-related LBP according to gender.

Data Analysis

Data were processed using the Statistical Package for Social Sciences (SPSS) computer software. Differences were considered significant if p value was ≤ 0.05 . The Pearson chi-square test was used to assess the extent of association between two categorical variables. In case of skewed non-normal variables like rating score, the median, 2.5th and 97.5th percentiles were used as measures of location and variation, and the Mann-Whitney U nonparametric test was used to assess the significance of the difference between two quantitative variables.

Results

Of the 143 physical therapists, 100 who are college graduates (34 males, 66 females) responded to the questionnaire. The mean age of responding physical therapists was 35.9 ± 8.5 years (23–58 years) (table 1). The age distribution is similar in both work-related and non-work-related groups. Sixty-four percent of participating physical therapists had been in their current position for less than 10 years (mean 9.7 ± 8.5 years). With respect to duration of experience as a physical therapist 83% re-

Table 2. Basic data and LBP characteristics among responding physical therapists (n, %) according to gender and work relation

	Work-related LBP			Non-work-related LBP			Total	
	M (n = 21)	F (n = 49)	subtotal (n = 70)	M (n = 13)	F (n = 17)	subtotal (n = 30)	M (n = 34)	F (n = 66)
<i>Speciality</i>								
General	6 (28)	8 (16)	14 (20)	8 (62)	3 (18)	11 (37)	14 (41)	11 (16.6)
Neurology	6 (28)	11 (22)	17 (24)	2 (15)	4 (24)	6 (20)	8 (23.5)	15 (23)
Orthopedic	6 (28)	18 (37)	24 (34)	3 (23)	5 (29)	8 (27)	9 (26.4)	23 (35)
Burns/plastic	1 (5)	1 (2)	2 (3)	0 (0)	0 (0)	0 (0)	1 (3)	1 (1.5)
Geriatric	1 (5)	0 (0)	1 (1.4)	0 (0)	1 (6)	1 (3)	1 (3)	1 (1.5)
Pediatrics	1 (5)	9 (18)	10 (14)	0 (0)	3 (18)	3 (10)	1 (3)	12 (18)
Cardiac	0 (0)	2 (4)	2 (3)	0 (0)	0 (0)	0 (0)	0 (0)	2 (3)
<i>Work setting</i>								
General hospital	9 (43)	22 (45)	31 (44)	6 (46)	4 (24)	10 (33)	15 (44)	26 (39)
Rehabilitation center	10 (48)	19 (39)	29 (41)	7 (54)	6 (35)	13 (43)	16 (47)	25 (38)
Private hospital	1 (5)	1 (2)	2 (3)	0 (0)	2 (12)	2 (7)	1 (3)	3 (4.5)
Special school	1 (5)	6 (12)	7 (10)	0 (0)	3 (18)	3 (10)	1 (3)	9 (13.6)
Community care	0 (0)	0 (0)	0 (0)	0 (0)	1 (6)	1 (3)	0 (0)	1 (1.5)
<i>Physical disability before LBP</i>								
None	16 (76)	37 (76)	53 (76)	13 (100)	14 (82)	27 (90)	29 (85)	51 (77)
Musculoskeletal	5 (24)	11 (22)	16 (23)	0 (0)	3 (18)	3 (10)	5 (15)	14 (21)
Neurological	0 (0)	1 (2)	1 (1.4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1.5)
<i>Type of LBP before working as physical therapist</i>								
None	16 (76)	35 (71)	51 (73)	13 (100)	17 (100)	30 (100)	29 (85)	52 (79)
Mild	4 (19)	13 (27)	17 (24)	0 (0)	0 (0)	0 (0)	4 (12)	13 (19.6)
Moderate	1 (5)	1 (2)	2 (3)	0 (0)	0 (0)	0 (0)	1 (3)	1 (1.5)
<i>Functional limitations before working as physical therapist</i>								
None	17 (80)	41 (84)	58 (83)	13 (100)	16 (94)	19 (94)	30 (88.2)	57 (86)
Mild	2 (10)	8 (16)	10 (14)	0 (0)	1 (6)	1 (6)	2 (6)	9 (13.6)
Moderate	2 (10)	0 (0)	2 (3)	0 (0)	0 (0)	0 (0)	2 (6)	0 (0)

Frequencies do not always add to the total due to missings. M = Male; F = Female.

ported less than 20 years, with a mean of 12.5 ± 8.3 years. The physical therapists with work-related LBP reported direct patient contact of 30–40 h with a mean of 33.1 ± 16.4 h per week. The main employers were general hospitals (41%), rehabilitation centers (41%) and special education schools (10%). Fifty-seven of the 100 physical therapists (18 males and 39 females) reported current LBP leading to a point prevalence rate of 57% (31.6% in males and 68.4% in females). The lifetime prevalence of work-related LBP was 70% (61.8% in males, 74.2% in females). In general, more females than males reported LBP.

The most common areas of specialty with work-related LBP were orthopedics (n = 24, 34%) and neurology (n = 17, 24%), while 'general' accounted for the most non-work-related LBP (n = 11, 37%). Most female physical therapists (n = 23, 35%) reported orthopedics as their area of specialty, while males (n = 14, 41%) reported their specialty as 'general' (table 2).

The distribution of work settings among those with and without work-related LBP was fairly similar (table 1). However more females than males worked at the special education schools. Physical disability before having LBP was mainly musculoskeletal in both females and males, but it was higher among those with work-related (23%) than in those without work-related LBP (10%). Moreover, females (21%) reported higher musculoskeletal disability than males (15%). Of the 17 (13%) with work-related LBP before entering the profession, 76.5% were females; 14% of them reported mild functional limitations in their daily activities before entering the profession.

Among those with work-related LBP (table 3), 37 (52.8%) reported mild LBP, 41 (58%) chronic LBP, 45 (64%) duration of 1 week, and in 60 (86%) of the physical therapists with LBP, injury occurred mainly in hospital settings. Further 54.3% reported impact of LBP on their regular activities due mostly to lifting and carrying

Table 3. Characteristics of work-related LBP among physical therapists (n, %)

	M (n = 21)	F (n = 49)	p value*	Total
Type of LBP				
Mild	12 (57)	25 (51)	NS	37 (53)
Moderate	9 (43)	23 (47)		32 (46)
Severe	0 (0)	1 (2)		1 (1.4)
Onset of LBP				
Acute	9 (43)	20 (41)	NS	29 (41)
Chronic	12 (57)	29 (59)		41 (58)
Duration of LBP				
< 1 week	1 (5)	0 (0)	NS	1 (1.4)
1 week	14 (67)	31 (63)		45 (64)
2–4 weeks	5 (24)	15 (31)		20 (29)
>4 weeks	0 (0)	1 (2)		1 (1.4)
Work setting in which injury occurred				
Hospital	19 (90)	41 (84)	NS	60 (86)
University	0 (0)	2 (4)		2 (3)
Special school	1 (5)	5 (10)		6 (9)
Community care	1 (5)	1 (2)		2 (2.8)
Effect of LBP on regular activities				
No	11 (52)	21 (43)	NS	32 (46)
Yes	10 (48)	28 (57)		38 (54)
Activities during LBP injury				
None	9 (43)	19 (39)	NS	28 (40)
Lifting, carrying	8 (38)	8 (16)		16 (23)
Pulling, pushing	0 (0)	2 (4)		2 (3)
Patient handling	2 (10)	6 (12)		8 (11.4)
Prolonged sitting	1 (5)	4 (8)		5 (7)
Prolonged standing	1 (5)	8 (16)		9 (13)
Limitations due to LBP				
No limitation	1 (5)	2 (4)	0.029	3 (4.3)
Sick leave	5 (24)	10 (20)		15 (21)
Compensation	0 (0)	11 (22)		11 (16)
Decreased non-work activities	9 (43)	11 (22)		20 (29)
Decreased number of working hours	3 (14)	1 (2)		4 (6)
Change of work setting	2 (10)	6 (12)		8 (11.4)
Others	0 (0)	7 (14)		7 (10)
Pain score				
Median (2–5th, 97.5th percentiles)	4 (0–10)	5 (0–8)	NS**	

* Chi-square test: categories with low frequency were pooled. ** Mann-Whitney U test. NS = Not significant.

(22.9%) as the major activity precipitating the work-related LBP. Decreased non-work activities (28.6%) such as activities outside work setting like shopping or home duties were the most frequently described limitation due to work-related LBP. The severity of back discomfort required 8 (11.4%) of the therapists to change their work setting. Work-related LBP was not significant between male and female physical therapists and equally the difference in the median pain score between males and females was not significant. The distribution of current LBP by site is presented in table 4. A total of 57 subjects (81.4%) out of 70 physical therapists with work-related LBP reported

having current back pain at the time of completing the questionnaire. Subjects with and without LBP reported the current pain mainly at low back and buttocks.

Discussion

The lifetime and point prevalence of work-related LBP among physical therapists in Kuwait are high and may be due to the nature of the occupation. The occupational hazards and job factors that include lifting or transferring dependent patients, age and gender of physical therapist,

Table 4. Location of current LBP among physical therapists (n, %)

Location	M (n = 18)	F (n = 39)	Total (n = 57)
Low back	8 (44.4)	14 (35.8)	22 (38.5)
Low back and buttocks	8 (44.4)	23 (58.9)	31 (54.3)
Shank	2 (11.1)	2 (5.1)	4 (7.0)

work setting and specialty could account for the high prevalence. The findings of this study are similar to those reported among physical therapists in Great Britain [12], Canada [13] and USA [14, 17]. More than half of the LBP injuries occurred within the first 5 years of work, probably due to improper body mechanics and faulty techniques during the daily activities of handling patients.

In the present study, female physical therapists reported higher rate of LBP than males, a finding similar to that of Bork et al. [17], probably due to weight and size of the female physical therapist. In general females have smaller body build than males, which apparently is a physical disadvantage when lifting or transferring larger patients. Equally important is the fact that some of the females were pregnant and the stress associated with pregnancy could have contributed to the LBP recorded by the female physical therapist. However, Mierzejewski et al. [13] did not observe any gender difference in LBP. In this study, working in orthopedics specialty (table 2) accounted for a majority of work-related LBP (34%) and more females (37%) than males (28%) worked in orthope-

dics. Apparently specialty is a contributing factor to work-related LBP among physical therapists in Kuwait. The majority of physical therapists (86%) (table 3) reported LBP injury while working in hospitals, probably due to the fact that the patients in the hospitals are less independent and require more care (lifting and transferring patients). This finding is consistent with other reports [12, 13]. LBP had a clear effect on daily activities thereby resulting in decreased non-work-related activities, sick leaves, and decreased number of working hours and even some therapists changing their work setting (table 3).

The prevalence of work-related LBP reported in the present study is higher than that reported among nurses [15, 16], although in both professions lifting patients to and from bed or transferring patients is commonly performed. It would therefore seem that nurses were either better trained or acquired a more efficient method of performing these duties. The contributory roles of ergonomic factors, technique of carrying/lifting and the work environment to back injury need to be further evaluated for the risk of back injury. A long-term longitudinal cohort study is required to determine the etiology, risk factors and role of ergonomic factors of the working environment.

Conclusion

The finding shows that LBP is a common problem with a high work-related life and point prevalence among physical therapists in Kuwait.

Appendix

Questionnaire for the Study of LBP among Physical Therapists in Kuwait

A Personal Information

1 Age

2 Gender

Male

Female

3 Family income

<500

500–1,000

>1,000

4 Academic training

Applied education

College

Others, specify _____

5 Medical disease before developing low back pain (LBP)

Hypertension

Diabetes mellitus

Cardiac diseases

Others, specify _____

6 Past medical treatment conditions

None

Antihypertensive

Hypoglycemic (oral, insulin)

Cardiac medications

Others, specify _____

7 Physical disability prior to developing LBP

None

Musculoskeletal

Neurological

Others, specify _____

Appendix (continued)

<p>8 <i>Area of specialty</i></p> <table border="0"> <tr> <td>Neurology</td> <td>Orthopedics</td> </tr> <tr> <td>Cardiology</td> <td>Geriatrics</td> </tr> <tr> <td>Burns/plastics</td> <td>Pediatrics</td> </tr> <tr> <td>General practice</td> <td>Home care</td> </tr> <tr> <td colspan="2">Others, specify _____</td> </tr> </table> <p>9 <i>Years of experience as a physical therapist (in years)</i></p> <p>10 <i>Work setting</i></p> <p>General hospital Private clinic Private hospital Special schools Community care Rehabilitation hospital</p> <p>11 <i>Duration of the current work setting (in years)</i></p> <p>12 <i>Nature of job</i></p> <p>Full-time physical therapist Part-time</p> <p>13 <i>Number of hours of direct patient contact per week</i></p> <hr/> <p>B Low Back Pain (LBP)</p> <p>14 <i>Before working as a physical therapist what type of LBP did you suffer?</i></p> <p>None Mild Moderate Severe</p> <p>15 <i>Before working as a physical therapist what type of functional limitations did you experience as a result of LBP?</i></p> <p>None Mild Moderate Severe</p> <hr/> <p>C Work-Related LBP</p> <p>16 <i>Did you have LBP during your work as a physical therapist?</i></p> <p>No Yes</p> <p><i>If yes</i></p> <p>17 <i>During work as physical therapist what type of LBP have you experienced?</i></p> <p>None Mild Moderate Severe</p> <p>18 <i>Onset of pain/injury</i></p> <p>Acute (sudden) Chronic (gradual)</p> <p>19 <i>Average duration of pain in days during LBP episode</i></p> <p>1 week 2–4 weeks >4 weeks</p>	Neurology	Orthopedics	Cardiology	Geriatrics	Burns/plastics	Pediatrics	General practice	Home care	Others, specify _____		<p>20 <i>Work setting in which injury occurred</i></p> <table border="0"> <tr> <td>Hospital</td> <td>University</td> </tr> <tr> <td>Private</td> <td>Community care</td> </tr> <tr> <td colspan="2">Special school</td> </tr> </table> <p>21 <i>Have you been affected by LBP from doing your regular activities?</i></p> <p>No Yes</p> <p>22 <i>Were you able to practice your regular activities during pain/injury (e.g. bending, bending and twisting, stooping)?</i></p> <p>No Lifting, carrying Pulling, pushing Patient handling Prolonged sitting Prolonged standing</p> <p>23 <i>What limitations did you have due to LBP related to work as a physical therapist?</i></p> <p>Sick leave Compensation Reduced non-work activities Reduced number of working hours Change of work setting Others specify _____</p> <p>24 <i>Are you currently (presently) experiencing LBP?</i></p> <p>No Yes</p> <p>25 <i>Mark the location of pain on body diagram</i></p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <p>a</p> <p>b</p> <p>c</p> <p>d</p> <p>d</p> </div> <div> <p>None</p> <p>Low back (area a)</p> <p>Low back and buttocks (area b)</p> <p>Thigh (area c)</p> <p>Shank (area d)</p> </div> </div> <p>26 <i>Rating (score of pain)</i></p> <table border="0"> <tr> <td colspan="2"> _____ </td> </tr> <tr> <td>0</td> <td>10</td> </tr> <tr> <td>No pain</td> <td>Maximum pain</td> </tr> </table>	Hospital	University	Private	Community care	Special school		_____		0	10	No pain	Maximum pain
Neurology	Orthopedics																						
Cardiology	Geriatrics																						
Burns/plastics	Pediatrics																						
General practice	Home care																						
Others, specify _____																							
Hospital	University																						
Private	Community care																						
Special school																							

0	10																						
No pain	Maximum pain																						

References

- 1 Nachemison A: Low back pain: Its etiology and treatment. *Clin Med* 1971;78:18–24.
- 2 Horal J: The clinical appearance of low back disorders in the city of Gothenburg, Sweden. *Acta Orthop Scand Suppl* 1969;118:8–73.
- 3 Frymoyer JW, Pope MH, Costanza MC, Rosen JC, Goggen JE, Wilder DG: Epidemiologic studies of low back pain. *Spine* 1980;5:419–423.
- 4 Kelsey J, White A: Epidemiology and impact of low back pain. *Spine* 1980;5:133–142.
- 5 Biering-Sorensen F: A prospective study of low back pain in a general population: Occurrence, recurrence, aetiology. *Scand J Rehabil Med* 1983;15:71–79.
- 6 Skovron ML: Epidemiology of low back pain. *Baillieres Clin Rheumatol* 1992;6:559–573.
- 7 Leboeuf-Yde C, Klougart N, Lauritzen T: How common is low back pain in Nordic population? *Spine* 1996;21:1518–1525.
- 8 Reigo T, Timpka T, Tropp H: The epidemiology of back pain in vocational age groups. *Scand Primary Health Care Suppl* 1999;17:16–21.
- 9 Kumar S: Cumulative load as a risk factor for back pain. *Spine* 1990;15:1311–1316.
- 10 Magora A: Investigation of the relation between low back pain and occupation. III. Physical requirements, sitting, standing and weight lifting. *IMS Indian Med Surg* 1972;41:5–9.
- 11 Videman T, Nurminen T, Tola S: Low back pain in nurses and some loading factors of work. *Spine* 1984;9:400–404.
- 12 Scholey M, Hair MD: Back pain in physiotherapists involved in back care education. *Ergonomics* 1989;32:179–190.
- 13 Mierzejewski M, Kumar S: Prevalence of low back pain among physical therapists in Edmonton, Canada. *Disabil Rehabil* 1997;19:309–317.
- 14 Molumphy M, Unger B, Jenson GM, Lopopolo RB: Incidence of work-related low back pain in physical therapists. *Phys Ther* 1985;65:482–486.
- 15 Harber P, Billet E, Gutowski M: Occupational low back pain in hospital nurses. *J Occup Med* 1985;27:518–524.
- 16 Stubbs DA, Buckle PW, Hudson MP, Rivers PM, Worringham CJ: Back pain in the nursing profession. 1. Epidemiology and pilot methodology. *Ergonomics* 1983;26:755–765.
- 17 Bork BE, Cook TM, Rosecrance JC, Engelhardt KA, Thomason ME, Wauford IJ, Worley RK: Work-related musculoskeletal disorders among physical therapists. *Phys Ther* 1996;76:827–835.