ORIGINAL ARTICLE

FACTORS PREDICTING BACK PAIN AND DISABILITY IN PATIENTS WITH NON-SPECIFIC LOW BACK PAIN

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ABSTRACT

Back pain and disability in patients with non-specific low back pain are chronic health problems and this continues to increase among Thai population. The current study was based on a prospective observational design, the objective of which was to identify factors predicting back pain and disability in patients with non-specific low back pain. The samples were patients diagnosed with non-specific low back pain, who were treated in an outpatient department at Nakhon Phanom Hospital. The 95 patients were enrolled in the study between May and December 2019. Data were collected through questionnaires. The research instruments used included the low back pain scale and the disability low back pain form. Finally, data were analyzed using binary logistic regression analysis method. There were 95 patients in the present study. According to the study, the farmers were at risk of low back pain up to 0.25 times more than those of non-farmers (AOR = 0.25, 95%CI: 0.07 – 0.96, p<0.05). The subjects with high disability were 4.32 times more likely to be at risk of low back pain than those with normal and low disability (AOR=4.32, 95%CI: 1.46-12.78, p< 0.05). In addition, gender, body mass index, history of back pain treatment, and duration of current episode were not found to influence lower back pain. Given factors influencing the disability, males were 3.37 times more likely to be at risk of disability than females (AOR = 3.37, 95%CI: 1.03 – 11.09, p<0.05) and (AOR=0.26 95%CI=0.07-0.99, p<0.05). The study also revealed that occupation, body mass index, duration of current episode, and history of back pain did not influence disability.

Keywords: *Back pain, Disability, Non-specific low back pain*

INTRODUCTION

Low back pain is a common symptom in relation to other spinal pains. Individuals are likely to experience lower back pain at certain times in their lives[1]. Recently, non-specific low back pain has been reported worldwide in both sexes and all ages. Low back pain accounts for 630 patients over the world[2]. The causes of the disease may be associated with the pathology[3], spine degeneration (lumbar spondylosis), as well as muscle strain and tendinitis without relation to dislocated fractures nor neurological signs[4].

Chronic lower back pain involves both neural and non-neural systems. In the musculoskeletal system, the symptoms caused by low back pain develop sciatic nerve pain, cramp in legs, monoparesis in feet. In addition, in the nerve system, the patients could experience loss of sensation and muscle power[5]. Those symptoms potentially exacerbate back pain, thus leading to poor care outcomes and the expression of inappropriate behavior. In other words, the disease impacts patients' life in various aspects of life including interfering and disrupting the process of daily activities (e.g., reduced movement, disability) as well as their quality of life[5].

As a result, when experiencing the disease, patients with low back pain are subjected to change of daily activities, family roles, and social roles. To illustrate, they are inclined to reduce interaction or participation. Rather, they become dependent and a burden on their family or caretakers. At work, the manifestation of the disease leads patients to develop stress, anxiety, regret depression; subsequently, the patients are aroused to display certain expression of aggressive behavior, social deprivation, or life boredom[6-8]. In addition, lower back pain treatment can also affect family economic status. Considerable expenses involve massage therapy, physical therapy, acupuncture, and chiropractor, etc[9-10]. In other words, lower back pain particularly in non-specific low back pain could

lead patients to develop almost all aspects of life including physical health, mental health and social deprivations. Previous studies have shown that both physical and psychological factors lead to chronic lower back pain such as gender, age, career, surgical history, anxiety, and pain levels, etc[5]. Therefore, the current research aimed to investigate factors predicting back pain and disability in patients with non-specific low back pain, whereby we also studied both personal factors and factors related to illness and treatment, including gender, occupation, body mass index, duration of current episode, and history of back pain treatment.

METHODOLOGY

Study design

A prospective observational study method was used. The samples were patients with non-specific low back pain who were treated at the outpatient department at Nakhon Phanom Hospital. They had been diagnosed by a doctor with non-specific low back pain and were treated at the outpatient department, orthopedic examination room, in Nakhon Phanom Hospital.

Subjects

When specified, the characteristics of the sample are as follows. As for inclusion criteria, the subjects were; (i) aged between 18-60 years, (ii) diagnosed with non–specific low back pain due to a disorder in the Lumbar Vertebrae, (iii) had back pain measured with numerical rating scales with a score of more than 3 points and patients were conscious, (iv) were fully aware, (v) able to communicate, (vi) understood Thai language and (vii) willing to participate in the research. As for exclusion criteria, the patients (i) had a history of treatment related to spinal injury and surgery, (ii) were diagnosed with bone cancer, (iii) underwent treatment for low back pain with other methods for at least 3 months (e.g., physical therapy, medication) and (iv) made available to participate in the study until completion of the study[11].

According to the sample size calculation, since this study did not acquire the exact number of population groups, G * power 3.1.9.2, a reliable sample calculation program, was used to calculate the sample. The power of testing was determined at .80 level. The statistical significance set was at the level of .05 (α = .05), and effect size equaled .25. There were 95 samples in total. Data collection was carried out from May 2019 - December 2019.

Outcome measures

The demographic data based on the questionnaire included gender, age, marital status, education, occupation, body mass index, duration of current episode, and history of back pain treatment.

The low back pain scale, with numerical rating scales: NRS, was used to assess lower back pain. The scores ranged from 0 to 10, with 0 = no pain and 10 = most pain[11]. The content validity index was equal to 1. Disability low back pain form used in this study was adapted from the Roland and Morris Disability Questionnaire[12]. The tool used to measure disability in patients with non-specific low back pain, comprising 24 questions, was applied from the questionnaire (Thai version) by Jiraratphonchai el al.[13] with the following scoring criteria, No = 0 (no disability) and Yes = 1 (disability). As for reliability, cronbach's alpha correlation coefficient was 0.74.

Data collection

The data were collected in the following order. The samples of non–specific low back pain patients were randomly selected at the outpatient department. They attended a bone and joint examination room after approval from the Ethics Committee, NP-EC11-No.5/2019. Right protection information and form were explained to the samples before participation in the study. If they agreed, they signed in an agreement form as a part of the study. We collected the data on the demographic characteristics the low back pain scale and disability low back pain form.

In the event that the samples failed to read the questionnaire, they were explained the questionnaire and read the message in sequence and one by one. The samples answered the question manually. The researcher was responsible for recording data on all 3 sets of assessments, in which the data collection took approximately 20-30 minutes each time.

Statistical analysis

Data regarding demographic characteristics of the participants, low back pain scale and the disability low back pain form were analyzed using descriptive statistics, number and percentage while median and interquartile range were used to summarize non-normally distributed data. To identify factors predicting back pain and disability in patients with non-specific low back pain, binary logistic regression analysis was interpreted and adjusted odds ratio (AOR) together with 95% confidence interval (CI).

RESULTS

Characteristics of the participants

There were 95 patients participating in the current study. The majority of subjects were middle-aged, females, married, employed and had secondary education and had no non-underlying disease. There was a high percentage of subjects who had normal Body Mass Index. More than half of the duration of current episode was 8 -12 week. Almost haft of the subjects (82) were present with a treatment history of low back pain (Table 1).

Table 1:. Characteristics of the participants (n = 95)

Characteristics	N	%
Gender-no. (%)		
Male	28	29.5
Female	67	70.5
Age-years (Mean = 53.5, SD = 9.0)		
18 - 29	1	1.1
30 - 39	4	4.2
40 - 49	29	30.5
50 - 59	47	49.5
> 60	14	14.7
Marital status		
Single	5	5.2
Married	88	92.6
Widowed/Divorced	2	2.2
Education-no. (%)		
Primary	1	1.0
Secondary	53	55.8
Diploma	26	27.4
Bachelor	15	15.8
Occupation		
Farmers	29	30.5
Employment	30	31.7
civil servants	12	12.6
Tradesmen	6	6.3
Unprofessional	18	18.9
Underlying disease		
Non- underlying disease	45	47.4
Asthma	14	14.7
Diabetes	16	16.8
Hypertension	20	21.1
Body Mass Index (Mean = 24.1, SD = 3.5)		
Underweight (≤ 18.5 km/m.^{2})	1	1.0
Normal (18.5-22.9 km/m.^{2})	36	37.9
Overweight (23.0-24.9 km/m.^{2})	23	24.2
Obesity (≥25.0 km/m^2)	35	36.9
Duration of current episode		
8-12 Weeks	74	77.9
> 12 Weeks	21	22.1
Treatment history of low back pain		
Absent	13	13.7
Present	82	86.3

Pain intensity and low back pain disability

Table 2 shows the total scores of pain intensity and low back pain disability. The patients (69) with low back pain gave the intense pain score (7-10) most, while patients with low back pain disability reported high disability score (14-23) most.

Factors predicting back pain (Pain intensity) and low back pain disability

Table 3 shows factors predicting back pain. As for the binary logistic regression, farmer samples were at risk of low back pain up to 0.25 times more than those of non-farmers (AOR = 0.25, 95%CI:0.07 – 0.96, p<0.05). The subjects with high disability were 4.32 times more likely to be at risk of low back pain than those with normal and low disability (AOR=4.32, 95%CI: 1.46-12.78, p< 0.05). In addition, gender, body mass index (BMI), history of back pain treatment, and duration of back pain was not found to influence pain intensity.

Given the factors predicting low back pain disability, the data from the logistic regression analysis indicated that males were 3.37 times more likely to be at risk of disability than females did (AOR = 3.37, 95%CI: 1.03 – 11.09, p<0.05) and (AOR=0.26 95%CI=0.07-0.99, p<0.05), respectively. In addition, occupation, body mass index (BMI), medical conditions, and history of back pain were unlikely to cause disability (Table 4).

Table 2. Pain intensity and Low back pain disability (n=95)

Variables	N	%
Pain Score (NRS)		
1-3 (Mild)	5	5.3
4-6 (Moderate)	21	22.1
7-10 (Intense)	69	72.6
Low back pain disability		
0-4 (low disability)	2	2.1
5-8	17	17.9
9-13	36	37.9
14-23 (high disability)	40	42.1

Low back pain disability (Roland and Morris Disability Questionnaire)

Table 3. Factors predicting back pain (Pain intensity) using binary logistic regression (n=95)

Variables	Adjusted odds ratio (95% confidence interval)	*P*-value
Male	1.45 (0.40-5.31)	0.57
Female	0.30 (0.07-1.23)	0.10
Occupation		
Farmers	0.25 (0.07 – 0.96)	0.044*
Employment	2.11 (0.60 – 7.46)	0.248
civil servants	2.71 (0.44 – 16.59)	0.281
Tradesmen	0.75 (0.03 – 17.51)	0.858
Low back pain disability		
0-13 (low + Median disability)	1	0.008*
14-23 (high disability)	4.32 (1.46 – 12.78)	
Body Mass Index (Mean = 24.53, SD=3.83)		
Underweight/normal	1	0.699
Overweight/obesity	1.27 (0.38 – 4.33)	
Duration of current episode		
< 12 Weeks	1	0.508
> 12 Weeks	0.49 (0.06 – 4.11)	
Treatment history of low back pain		
Absent	1	0.087
Present	4.98 (0.79 – 31.41)	

*P=0.05

Table 4 .Factors predicting disability level using binary logistic regression (n=95)

Variable	Adjusted odds ratio (95% confidence interval)	*P*-vaule
Male	3.37 (1.03 – 11.09)	0.045*
Female	0.26 (0.07 – 0.99)	0.048*
Occupation		
Farmers	0.29 (0.08 – 1.02)	0.054
Employment	1.53 (0.48 – 4.89)	0.471
civil servants	1.01 (0.28 – 3.71)	0.987
Tradesmen	2.39 (0.32 – 17.56)	0.394
Underlying disease		
Non- underlying disease	1.34 (0.47 – 3.82)	0.581
Asthma	0.74 (0.19 – 2.84)	0.664
Diabetes	0.69 (0.19 – 2.55)	0.573
Hypertension	1.17 (0.38 – 3.64)	0.784
Body Mass Index (Mean = 24.53 SD=3.83)		
Underweight/normal	1	0.735
Overweight/obesity	1.18 (0.45 – 3.09)	
Treatment history of low back pain		
Absent	1	0.679
Present	0.74 (0.18 – 3.05)	

*P= 0.05

DISCUSSION

Our study corroborates the findings from the previous studies. According to the study, the patients with low back pain had lower back pain with 7-10 pain scores (72.6%), similar to the study by Salvetti et al.[14] which found that of 177 disability patients with low back pain, the majority of them had low back pain with Visual numerical pain scale at 8-10 (61.6%). This finding is also consistent with the study of Jones et al.[15] in which 363 patients with low back pain were followed up and they were found that the pain scores at 60–79 (mm) (100 mm visual analog scale) were 68.7%. The current study found that there was a high disability among the subjects (44.2%) and that and the patients with lower back pain tended to have a high disability as high as 63.2%. This indicated that both lower back pain and disability may bring about a potential change of the patients' life in respect of body functions, performance in different functions, self-separation, psychological and emotional functions.

Given the occupational factors, farmers are less than 0.25 likely to have lower back pain than other occupations with the level of statistical significance at 0.05.

According to the data, certain occupations such as employees, civil servants, and tradesmen were at risk of back pain 0.25 times more than farmers. This finding supports several literature in the field. A study of 88 people with lower back pain showed that 19.3% of patients were the employees[16]. In addition, this finding is also consistent with a study on the relation of posture factors during work and lower back pain among industrial professionals in 433 cases, which found that the prevalence of lower back pain during the 7 workdays was as high as at 71.8 %, and for 12 months at 76 %. In addition, it is found that the prevalence of the time period during vacation was at 26.3%[17]. Kasim et al.[18] examined the short-term factors affecting lower back patient outcomes and found that recurrent pain factors, occupations, age, gender, and the level of education could predict short-term health results of people with lower back pain.

The findings indicated that the individuals with high disability were found to be at a higher risk of lower back pain more 4.32 times than those with a low and medium disability with statistical significance at the level of 0.05. The likely explanation may be that the patients with high disability are at a higher risk of developing low back pain. The current result accords

with an earlier study on chronic low back pain, which also revealed that the prevalence rate of these conditions relatively increases in individuals with lower back pain[14]. However, according to the current investigation, gender, body mass index, history of back pain, and duration of back pain did not influence lower back pain. This finding agrees with the literature in which patients with low back pain with more than 6 months were followed up and they were found that the factor affecting back pain was their daily activities[19]. A possible explanation for this may be age difference; in other words, male adolescents are more energetic and active than female adolescents (P = 0.025). Moreover, the lower back pain is also associated with gender and found in adolescents with active activities. To illustrate, female adolescents have less energy to do their activity than males; additionally, medical surveys show that women are more likely to receive counseling about lower back pain than men[20].

Given gender, the current study revealed that males were 3.37 times more likely to have a higher disability than their counterparts with the level of statistical significance at 0.05. This difference may be due to the posture from work; to illustrate, men are more involved with physical use such as carrying, which likely results in lower back pain and disability. Similarly, a study on lower back pain also indicated that the male subjects involved in heavy-work load were found to have high risk of lower back pain and subsequent disability[21]. It could be argued from the present study that gender factors influence the disability; however, certain factors are not found to influence disability, including occupations, diagnosis, body mass index, history of back pain treatment, and duration of current episode. The major limitation of this study lies in that fact that the sample size of individuals who were frequently involved in weight lifting (Gym) tend to have a heavier BMI due to bigger muscle mass and unless they frequently use correct postures, they might develop back pain in time.

CONCLUSIONS

The results of this research showed that farmers, occupational factors and disability in people with non-specific low back pain were identified to be contributing factors of lower back pain. In addition, given gender, more males are likely to suffer from disability of lower back pain. The result of present study suggested that the present-day clinical nursing care practices should acknowledge the significance of back pain and disability. This is because back pain and disability in patients with non-specific low back pain could develop chronic health problems.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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