Factors Associated with Functional Recovery among Patients with Low Back Pain*

Khuc Thi Hong Anh[1], Orapan Thosingha, RN, DNS[1], Wallada Chanruangvanich, RN, DNS[1]

Abstract

Purpose: To examine the relationships between pain, pain self-efficacy, anxiety, depression, and co-morbid diseases with functional recovery among patients with low back pain (LBP).

Design: Descriptive correlational design.

Methods: The sample was 126 patients with LBP who were treated in Rheumatology Unit at Bach Mai Hospital, Hanoi, Vietnam. Data were collected using patients' hospital record and 4 questionnaires: 1) the Numerical Rating Scale, 2) the Pain Self-efficacy Questionnaire, 3) the Hamilton Anxiety Rating Scale and Hamilton Depression Rating Scale, 4) the Oswestry Disability Index. Spearman's Rho was employed to test the relationships among studied variables.

Main findings: The findings revealed that pain was negatively correlated with functional recovery (r_s = - .56, p < .05), anxiety and depression were also negatively correlated with functional recovery (r_s = - .46, - .58, p < .05). Pain self-efficacy was positively correlated with functional recovery (r_s = .48, p < .05). Nevertheless, co-morbidity did not correlate with functional recovery (p > .05).

Conclusion and recommendation: To improve patients' functional recovery, nurses should assess and control pain, anxiety and depression as well as increase pain self-efficacy. A comprehensive guideline to improve patients' recovery should be developed and tested for its effectiveness with research before implementation.

Keywords: functional recovery, low back pain, self-efficacy, anxiety, depression

ปัจจัยที่มีความสัมพันธ์กับการฟื้นตัวด้านการทำหน้าที่ในผู้ป่วยที่มีอาการปวดหลังส่วนล่าง*

Khuc Thi Hong Anh[1] อรพรรณ โตสิงห์, พย.ด.[1] วัลย์ลดา ฉันท์เรืองวณิชย์, พย.ด.[1]

บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาความสัมพันธ์ระหว่างความปวด การรับรู้สมรรถนะแห่งตนในการจัดการความเจ็บปวด ความวิตกกังวลและภาวะซึมเศร้า และโรคร่วมกับการฟื้นตัวด้านการทำหน้าที่ของผู้ป่วยที่มีอาการปวดหลังส่วนล่าง

รูปแบบการวิจัย: การวิจัยเชิงสหสัมพันธ์

วิธีดำเนินการวิจัย: ศึกษาในผู้ป่วยผู้ใหญ่จำนวน 126 คน ที่มารับการรักษาตัวแบบผู้ป่วยในด้วยอาการปวดหลัง ในหน่วยรูมาตอยด์ของโรงพยาบาลบัคมาย กรุงฮานอย ประเทศเวียดนาม เก็บข้อมูลบางส่วนจากแฟ้มประวัติผู้ป่วย และแบบสอบถามจำนวน 4 ชุด: 1) the Numerical Rating Scale, 2) the Pain Self-efficacy Questionnaire, 3) the Hamilton Anxiety Rating Scale and Hamilton Depression Rating Scale, 4) the Oswestry Disability Index ใช้สถิติสเปียร์แมนโรว์ เพื่อวิเคราะห์ความสัมพันธ์ระหว่างตัวแปร

ผลการวิจัย: ผลการศึกษาพบว่า ความปวดมีความสัมพันธ์ทางลบกับการฟื้นตัวด้านการทำหน้าที่ของผู้ป่วยที่มีอาการปวดหลังส่วนล่าง (r_s = - .56, p < .05) ความวิตกกังวลและภาวะซึมเศร้ามีความสัมพันธ์ทางลบกับการฟื้นตัว (r_s = - .46, - .58, p < .05) การรับรู้สมรรถนะแห่งตนในการจัดการความเจ็บปวดมีความสัมพันธ์ทางบวกกับการฟื้นตัว (r_s = .48, p < .05) ทั้งนี้ภาวะโรคร่วมมีความสัมพันธ์กับการฟื้นตัวอย่างไม่มีนัยสำคัญทางสถิติ (p > .05)

สรุปและข้อเสนอแนะ: เพื่อช่วยส่งเสริมการฟื้นตัวของผู้ป่วย พยาบาลควรประเมินและควบคุมอาการเจ็บปวด จัดการกับปัญหาความวิตกกังวล ภาวะซึมเศร้า และส่งเสริมให้ผู้ป่วยมีการรับรู้สมรรถนะแห่งตนในการจัดการความปวดด้วยตนเองเพิ่มขึ้น ควรมีการพัฒนาแนวปฏิบัติเพื่อการส่งเสริมการฟื้นตัวด้านการทำหน้าที่ของผู้ป่วยที่มีอาการปวดหลังส่วนล่าง และทดสอบประสิทธิผลของแนวปฏิบัติด้วยงานวิจัยก่อนนำไปใช้จริง

คำสำคัญ: การฟื้นตัวด้านการทำหน้าที่ อาการปวดหลังส่วนล่าง การรับรู้สมรรถนะแห่งตน ความวิตกกังวล ภาวะซึมเศร้า

Background and Significance

Low back pain (LBP) was a common disorder associated with the back muscles and spinal columme at lumbar vertebrae 1 to 5 and sometimes related to sacrum. LBP was a global health problem with 36% worldwide[1]. In Asia, the lifetime prevalence of LBP was above 61.3% in rural area in Korea, and 11.2% was found in Vietnam[2].

LBP had an influence on patient's physical activities such as difficult movement of the spine, back bending, and body trunk rotation. Limitation of movement was usually derived from pain sensation. LBP also influenced psychological well-being including depression, anger, and anxiety[3,4]. According to Lambeek, et al. the annual economic burden for LBP was estimated to be 3.5 billion Euro in the Netherland[5]. Economic burden came from direct and indirect cost. The direct costs were hospitalization, medications, general practitioner fees, allied health care fees, and home care expenses; while indirect cost were decreased productivities of patients, withdrew from work, and decreased hours of work. In addition, expense of health care was relatively high due to spinal surgery and chronic pain management[4,5]. The ultimate goal in caring for patients with LBP was to restore their previous functions and daily life activities or assist them to obtain their functional recovery as soon as possible.

From literature review, there were various factors related to functional recovery of patients with LBP, including level of pain, anxiety, depression, co-morbid diseases, and pain self-efficacy. Pain intensity was associated with functional recovery; from previous studies indicated that the functional restoration of patients with LBP who suffered from severe pain was lower[4]. Anxiety and depression were found among patients with chronic LBP and they were positively associated with physical and mental health[3]. Accordingly, these psychological variables were expected to correlate with functional recovery. Patients with LBP who had several co-morbid conditions might impact their functional recovery. A study showed that patients with chronic LBP who had a greater co-morbidity burden demonstrated serious problems related to physical mobility; thus, their physical functions were deteriorated leading to delayed recovery[6].

Pain self-efficacy was an important factor that improved functional recovery of patients with LBP. According to Bandura (1986), self-efficacy was the belief in own's ability to perform successful special tasks or behaviors to obtain desirable outcomes. Therefore, pain self-efficacy could be used to explain the phenomena of patients with LBP who should have confidence to perform activities to achieve the desired goals. A previous research showed that pain self-efficacy significantly positive associated with physical function ($r = .50$, $p < .05$), and psychological function ($r = .45$, $p < .05$)[7].

In Vietnam, there was a recent research conducted by Nguyen Thi Thanh Thuy in the year 2012 to 2013 in 902 people aged 18 years and older who resided in inner districts of Ho Chi Minh City to survey chronic pain experienced in people. The result revealed that there were 28.93% of people who experienced LBP. Majority of them were women, elderly, unemployed or retired persons, people with low education and low income, and women with many children[8].

The scientific study related to patients with LBP in Vietnam was still limited so that there was inadequate scientific evidence to support the phenomena of people with LBP. Therefore, this study was conducted to identify factors such as pain, pain self-efficacy, anxiety, depression, and co-morbidity that might relate to functional recovery of patients with LBP. The findings from this study will be able to help nurses to plan nursing care program to assist Vietnamese people with LBP to be able to recover their functions and resume normal life.

Objective

To examine the relationships between pain, pain self-efficacy, anxiety, depression, and co-morbid diseases with functional recovery among patients with low back pain.

Hypothesis

1. Pain self-efficacy was positively correlated with functional recovery among patients with LBP.

2. Pain, anxiety, depression, and co-morbid diseases were negatively correlated with functional recovery among patients with LBP.

Methodology

Population and Sample

Population was patients with LBP who came to receive treatment at the Rheumatology Ward, Bach Mai Hospital, Hanoi, Vietnam.

Sample was selected from the population with the inclusion criteria: 1) age 18 years and older, 2) able to communicate in Vietnamese language; the exclusion criteria: 1) having pain from oncological origin, 2) receiving lumbar surgery less than 3 months prior to the data collection.

Sample size was calculated using G*power program[9] to determine the minimum number of participants needed for multiple linear regression or correlation design with level of significance .05, the power of the statistical test (Power 1-β = .9). There were five independent variables in this study and medium effect size for this study was calculated from $R^2 = .13$[10]. Based on G*power and increased 5% for missing data, sample size was 126 patients with LBP.

Research Instruments

The instruments used for data collection were as follows:

1. Demographic data and health information included age, gender, education, occupation, income, marital status, diagnosis, duration of illness, co-morbidity, payment method, etc.

2. The Numerical Rating Scale (NRS), was developed by McCaffery in the year 1968. NRS is a rating scale showing number reflecting severity of pain from 0 to 10 in a horizontal line. Patients were asked to verbally rate their pain on this scale with "0" equal to no pain and "10" equal to worst possible pain. The values on the pain scale correspond to pain levels as follows: 1-3 = mild pain, 4-6 = moderate pain, 7-10 = severe pain[11].

3. The Pain Self-efficacy Questionnaire (PSEQ)[12], PSEQ was a 10-item questionnaire to assess the confidence of patients in performing activities related to pain management. Patients can answer by circling number on a 7-point Likert scale under each item, where 0 = not at all confidence and 6 = completely confidence. A total score ranged from 0 to 60, higher scores reflected strong pain self-efficacy. The internal consistency reliability, Cronbach's alpha was .83 with 30 subjects and .89 with 126 studied subjects.

4. The Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D), these two instruments were in the public domain[13]. They were used to measure the severity of anxiety and depression. The HAM-A had 14 items scored on 5-point Likert scale from 0 = Not present, 1 = Mild, 2 = Moderate, 3 = Severe, 4 = Very severe. The total score ranged from 0 to 56, under and equal 17 = mild severity, 18-24 = mild to moderate severity, and 25-30 = moderate to severe. The internal consistency reliability, Cronbach's alpha was .66 with 30 subjects and .77 with 126 studied subjects.

The HAM-D had 17 items with the range of scores as score < 10 = no depression, score 10-13 = mild depression, score 14-17 = moderate depression, and score > 17 = severe depression. The internal consistency reliability, Cronbach's alpha was .72 with 30 subjects and .67 with 126 studied subjects.

5. The Oswestry Disability Index (ODI) was used to assess patient's disability with LBP[14]. The ODI had 10 parts described limitation of daily living activities including 1) pain intensity, 2) personal care, 3) lifting, 4) walking, 5) sitting, 6) standing, 7) sleeping, 8) social life, 9) traveling, 10) change degree of pain. The total scores ranged from 0 to 100 and were transformed to percentage: 0% to 20% = minimal disability, 21% to 40% = moderate disability, 41% to 60% = severe disability, 61% to 80% = crippled, 81% to 100% = either bed-bound or exaggerating their symptoms. The internal consistency reliability, Cronbach's

alpha was .62 with 30 subjects and .85 with 126 studied subjects.

Four research instruments have received permission to use as appropriate and were translated to Vietnamese by English teacher. Content validity was performed by 5 experts including physicians, head nurse, and nurses working in LBP unit.

Protection of Human Subjects

This project was approved by the Institutional Review Board (IRB) of Faculty of Nursing, Mahidol University, Thailand (COA No.IRB-NS 2016/354.0205) and IRB of Vietnam National University, Vietnam. The researcher recruited subjects as standard process specified by the IRB. The researcher strictly concerned with the issues of independently to make decision to consent, anonymity, and confidentiality of the subjects.

Data Collection

After obtaining permission to collect data from the director of Bach Mai Hospital, the researcher started to collect data as follows:

1. The research assistant explained the objectives of the study, data collection procedure, anonymity, and confidentiality; then invited patients to participate in the study. If the patient voluntarily consented to be in the study, he/she will be asked to sign the consent form.

2. The researcher collected some demographic data from medical record and then interviewed the subjects with 4 questionnaires included 72 items and the total time for data collection was about 30-45 minutes.

Data Analysis

All studied variables were tested for normal distribution and none of them were normal distributed. Therefore, the researcher used Spearman's Rho correlation to test the relationships among studied variables instead of Pearson Product Moment Correlation.

Findings

Demographic data and health information

The findings revealed that age of subjects ranged from 18 to 88 years with the average age of 54.84 years (SD = 17.11); 52.4% were males and 47.6% were females; 35.7% finished secondary school; 70.6% were married; 31.0% were retired and another 31.0% were farmer; 57.9% lived in the city while 41.3% lived in the rural; average income per month was 152.76 US$.

A half of subjects (50.0%) had LBP for less than 12 months with the mean duration of 56.57 months (SD = 91.07 months), 49.2% had LBP without any specific disease. Most of them (85.7%) had length of hospital stay less than 7 days.

Pain, pain self-efficacy, anxiety, depression, and functional recovery

About half of subjects (51.6%) suffered with moderate and 42.1% with severe pain. The average score of pain self-efficacy was 32 (SD = 12.6) which reflected moderate pain self-efficacy.

About half of subjects (56.3%) had mild to moderate anxiety and 27.0% had moderate to severe anxiety. It should be noted that 26.2% of subjects had moderate depression, 15.1% had severe depression.

There were 62.7% of subjects, who did not have co-morbid diseases, and 29.4% had one co-morbid disease. In regard to functional recovery, 69.0% of subjects demonstrated moderate disability while 7.9% with severe disability.

The correlation between pain, pain self-efficacy, anxiety, depression, and comorbidity with functional recovery among patients with LBP

The findings partially supported the proposed hypotheses. Pain was negatively correlated with functional recovery ($r_s = -.56$, $p < .05$), anxiety and depression were negatively correlated with functional recovery ($r_s = -.46, -.58$, $p < .05$). Pain self-efficacy was positively correlated with functional recovery ($r_s = .48$, $p < .05$). However, co-morbidity did not correlate with functional recovery ($p > .05$). (Table 1)

Table 1: Correlation between pain, pain self-efficacy, anxiety, depression, co morbidity and functional recovery (n = 126)

	1	2	3	4	5	6
1. Pain	1.00					
2. Pain self-efficacy	- .21*	1.00				
3. Anxiety	.32*	- .23*	1.00			
4. Depression	.44*	- .30*	.67*	1.00		
5. Co-morbidity	.01	- .14	- .17*	.01	1.00	
6. Functional recovery	- .56*	.48*	- .46*	- .58*	.11	1.00

*p < .05, Spearman's Rho correlatio

Discussion

The functional recovery was in the average score of 26.39 (SD = 10.48). More than a half of the patients (69.0%) demonstrated moderate disability whereas 7.9% demonstrated severe disability. However, sample with crippled or bed-bound were not found. This finding reflected that majority of patients with LBP experienced disturbance in their daily life. More evidences from this finding showed that these patients had to change the way of body cleaning or dressing and were unable to perform personal care without help. They also had limitation in walking and changing position, they had to use cane for walking and 22.2% spent most of time in bed and 28.6% avoided standing because it increased suffering from LBP. Having LBP also disturbed patients in all forms of travel (46.8%). Difficulties in performing routine functions due to pain on movement made patients become more psycho logical distress[15]. Moreover, 46.8% of patients were aged 60 and over so that the functional ability and social function also declined with aging process. The functional impairment related to their daily activities and led them to poor emotional and physical distress[16]. In regard to fnctional recovery, it can be concluded that majority of patients with LBP had limitation in performing their own daily activities and social life.

Hypothesis 1: Pain self-efficacy was positively correlated with functional recovery among patients with LBP.

Hypothesis 1 was supported that pain self-efficacy was positively correlated with functional recovery (r_s = .48, p < .05). It meant that patients with LBP who had strong beliefs in their own capability would experience good functional recovery and became healthier than those who had low pain self-efficacy. A qualitative reseach conducted by Bailly, et al. among 25 patients with chronic LBP found that all patients felt that they were unable to perform their social role, both at home and at work. Most of female subjects reported that they were not able to carry a child or to care for children which made them felt that they could not fulfill their roles. Some male subjects perceived loss of masculinity due to the impossibility to carry heavy items like luggage while they travelled with their families. These brought them the feeling of guilty and shameful leading them to have poor self image[15]. Therefore, these patients needed support and help in pain management from family and friends.

Hypothesis 2: Pain, anxiety, depression, and co-morbid diseases were negatively correlated with functional recovery among patients with LBP.

The findings revealed that pain level was negatively correlated with functional recovery (r_s = - .56, p < .05) which meant that patients who had high level of pain demonstrated low level of functional recovery. The majority of subjects in this study suffered with moderate and severe pain (51.6% and 42.1%, respectively), which was an obstacle to functional ability. The major cause of LBP was the biomechanical of the disc structure. Moreover, sensitization of

nerve endings will be changed by the released of chemical mediators, and neurovascular growth into the degenerated disks can cause pain[17]. Therefore, patients who experienced back pain at the lumbar level were more likely to avoid any activities related to their body movement[3,4].

Anxiety was negatively correlated with functional recovery (r_s = - .46, p < .05). Patients who had more anxiety would have poor functional recovery. This result was similar to the study of Bean, Johnson and Kydd among patients with chronic LBP[3]. They found that phychological distress or high level of anxiety were strongly associated with pain and kinesiophobia leading to patients' avoidance in movement[3].

The findings also showed that depression was negatively correlated with functional recovery (r_s = - .58, p < .05). The result indicated that patients who had more depression would demonstrate poor functional recovery. It was important to note that 34.1% of subjects had mild depression, and 15.1% showed severe depression which meant that more than half of subjects with LBP in this study had depression in some degrees. This finding was similar to the study of Bean, Johnson and Kydd in that depression had strong relationship with recovery in patients with chronic LBP[3]. The finding was also congruent with the study of Pinheiro, et al. in that depression was negatively associated with the course of recovery[18].

Surprisingly, co-morbid disease was not correlated with functional recovery among patients with LBP in this study. This result was similar to many previous studies[19,20]. In contrast, it was not relevant to the study of Gore which found that among patients with LBP, co-morbid disease played vital roles in functional recovery[6]. This might be able to explain that patients who had co-morbid diseases were in relatively small numbers (37.3%) and they did not have severe co-morbid diseases. These patients may receive proper treatment to control their diseases and regularly attended the clinic so that the effect of co-morbid diseases on functional recovery was not found.

Conclusion and Implication for Nursing Practice and Further Research

To obtain optimum functional recovery among patients with LBP, nurses should improve patients' pain self-efficacy by empowering them to believe in their own capability. The other vital role of nurses is providing patients with information about proper pain management such as knowledge about back muscle exercise and appropriate body position. Among the aged patients, their family caregivers should be informed about knowledge to empower the patients, strategy to detect and manage pain, anxiety and depression. Guidelines to decrease and control patients' pain, anxiety and depression should be developed. Patients' functional recovery should be assessed by using the ODI during patients' follow up visit to monitor the progress in their functional recovery. Identify and manage ones who have problems with recovering progress while maintain ones who show good progress. The ODI in Vietnamese version should be tested in its psychometric property by using adequate numbers of subjects. Further study should be conducted among patients with LBP to give the broader picture about patients suffering with LBP in Vietnam.

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