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Psychosocial Factors in Relation to Disability in Patients with Chronic Low Back Pain

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ABSTRACT
Background: One of the most common complaints is low back pain (LBP). It adds a lot of extra effort for general practitioners. **Objective:** The aim of the current study was to assess the impact of various risk factors, in particular psychosocial factors on pain intensity and disability in patients with chronic LBP.
Patients and methods: The present case control study comprised 30 adult patients suffering from low back pain, persisting for more than 6 months in duration, as well as, 30 adult healthy (pain-free) individuals of matching age, sex and BMI. **Results:** Pain intensity by VAS was positively correlated with Total Oswestry Disability Questionnaire had moderate to severe disability (P<0.001). As for disability, it was positively correlated with age but not with disease duration (P<0.05). Beliefs and attitudes by SOPA showed that patients had statistically significant higher scoring than controls regarding disability, harm and emotions sub-items. Pain and disability were statistically significantly correlated with disability, harm, emotion and solicitude sub-items.
Conclusion: Psychological factors interactions are of utmost importance in chronic LBP patients. Hence, their assessment is crucial for any comprehensive evaluation and management of a chronic pain patient. Anxiety and depression were associated with chronic LBP patients. Negative attitudes and beliefs are increasingly accepted as having an important role in disability related to back problems.
Keywords: Psychosocial Factors, Disability, Low Back Pain.

INTRODUCTION

One of the most common complaints is low back pain (LBP). It makes a significant impact on the workload of family medicine. In any given year, 7% of the adult population will seek help for this issue. It is widely accepted, however, that the majority of these episodes will be brief, and that "80-90 percent" of episodes of LBP recover in roughly six weeks **(1).**

About 35% will eventually experience chronic, persistent pain, incapacity in everyday living, and work loss. Most occurrences of pain cannot have a specific origin pinpointed. However, there is only a modest relationship between the etiology and the occurrence of back discomfort. It's possible that the causes of the first pain are distinct from those of the chronic pain **(2)**.

Disabilities are common, and LBP is a major contributor. It has been said that back pain disability is a phenomenon of the 20th century. Patients with similar physical findings in the back may have widely varying degrees of impairment **(3).**

A growing body of evidence suggests that patients' attitudes and beliefs especially fear avoidance beliefs and passive coping techniques play a significant role in the development of disability due to back disorders **(3).**

The likelihood that pain, disability, and time away from work will persist over time can be predicted in large part by psychological factors. However, depression symptoms may take precedence over pain characteristics when determining whether or not someone with chronic low back pain should seek medical attention. Low back pain consultations should take into account patients' psychological and social circumstances **(4).**

The aim of the current study was to assess the impact of various risk factors, in particular psychosocial factors on pain intensity and disability in patients with chronic LBP.

PATIENTS AND METHODS

The present case control study included 60 participants recruited from El GAlaa Teaching Hospital and Ahmed Maher Teaching Hospital.

Patient Group: A total of 30 adult patients, complaining of LBP of mechanical origin, which lasts more than 6 months were enrolled in our study. Patients with LBP less than 6 months, having LBP as a result of, inflammatory, infective, neoplastic, traumatic, metabolic, or congenital abnormalities or having referred LBP were excluded from the study.

Control Group: A total of 30 healthy individuals of matching age, sex and BMI, served as a control group. All subjects were assessed for history, general examination with pulse, blood pressure, temperature and respiratory rate measuring and BMI. Lower limbs were examined for motor, sensory and reflexes.

Spinal Movements:

- **Anterior spinal flexion:** The patient was advised to stand with his feet together and bend forward until his fingers touched the floor (the patient flexes to within 10 cm from the floor).
- **Lateral spinal flexion:** The patient was instructed to run his hands down each of his legs, one at a time, and mark the distance, in cm, that his hands travelled before touching the floor. The patient was instructed to run his hands down each of his legs,

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one at a time, and mark the distance, in cm, that his hands travelled before touching the floor.

- **Spinal extension:** Patients with typical ranges of motion (maximum theoretical range in thoracic is 25 degrees, in lumbar is 35 degrees, in normal subjects about 30 degrees total) were asked to arch their backs while their pelvises were held stationary and their shoulders were pulled back.
- **Spinal rotation:** The patient should be instructed to stand with his feet together, and then to twist to both sides. The angle of rotation is determined by the angle created by the shoulder and pelvis planes. The standard upper limit is 40 degrees, and it's all in the chest.
- **Straight leg raising (SLR) test:** Patients were advised to raise one leg off the bed while lying supine so doctors could examine their faces. When the patient started complaining about back or leg discomfort, rather than hamstring tightness, the doctor told him to cease. Parathesias, also known as radiating root aches, are a strong indicator of nerve root irritation. It was determined that a 60-degree angle was positive [(5)].

Radiological Study:
The diagnostic accuracy of any readily available imaging techniques, such as x-rays, MRIs, or CT scans, was evaluated.

Special Tests:
I. Pain intensity measurement: Assessed by: Verbal descriptive scale (VDS)[(6)], and visual analogue scale (VAS)[(7)].

II. Disability assessment (Revised Oswestry Disability Questionnaire).

III. Psychological measures:
Both patients and control were subjected to the following:
1. Anxiety and depression assessment.
2. Beliefs and attitudes dimensions
3. Coping strategies.
4. Locus of control
5. Social factors (that affect the course of pain): (a) Anxiety and Depression Assessment [(8)]. (b) Beliefs and Attitudes: Survey of Pain Attitudes (SOPA) [(9)]. (c) Chronic Pain Coping Inventory (CPCI) [(10)]. (d) Locus of Control; the Multidimensional Health Locus of Control Scale (MHLC) [(11)]. (e) Social factors that affect the course of pain include: (i) Life events, and (ii) Job dissatisfaction.

Ethical Consent: This study was ethically approved by the Institutional Review Board of the Faculty of Medicine, Zagazig University. Written informed consent was obtained from all participants. This study was executed according to the code of ethics of the World Medical Association (Declaration of Helsinki) for studies on humans.

Statistical Analysis

The collected data were introduced and statistically analyzed by utilizing the Statistical Package for Social Sciences (SPSS) version 20 for windows. Qualitative data were defined as numbers and percentages. Chi-Square test, Fisher's exact test and Chi-Square for Linear Trend were used for comparison between categorical variables as appropriate. Quantitative data were tested for normality by Kolmogorov-Smirnov test. Normal distribution of variables was described as mean, standard deviation (SD), median and confidence intervals, and student's t-test was used for comparison between groups. To evaluate the relationship between 2 normally distributed variables, Pearson's correlation coefficient was used. P value ≤ 0.05 was considered to be statistically significant.

RESULTS

The age of the patient group ranged from 18 to 76 years. They were 7 males (23.3%) and 23 females (76.7%). The disease duration ranged from 0.8 to 20 years. Only 3 patients (10%) had normal weight, 14 patients (46.7%) were overweight while 13 patients (43.3%) were obese. Table 1 summarizes the demographic and clinical characteristics of the studied patients. The age of the control group ranged from 25-51 years, with a mean of 39.9 (SD 7.18) years. They were 6 males (20%) and 24 females (80%). Their BMI had a mean of 29.41 (SD 2.59); 6 (20%) individuals had normal weight, 21 (70%) individuals were overweight, and 3 (10%) individuals were obese.

Comparing age, sex and BMI of patients versus control revealed non-statistical significant differences (t-test 0.07, P=0.9; Chi-square test 0.1, P=0.5; t-test 0.9, P=0.3, respectively).

Table (1): General characteristics of the study group.

Parameters	Number = 30
Male : Female ratio	7 : 23
Age (years)	39.7 ± 13.32
Disease Duration (years)	4.86 ± 4.10
BMI	30.33 ± 4.99
Occupation:	
House wife	14 (46.7%)
Office workers	7 (23.3%)
Manual workers	5 (16.7%)
Long standing	4 (13.3%)
Diagnosis :	
Disc lesions	17 (56.6%)
Spondylosis	6 (20 %)
Spondylolisthesis	5 (16.7%)
Spinal canal stenosis	2 (6.7%)

Correlating Pain intensity by "VAS" with Total Oswestry Disability Questionnaire as well as its different items revealed a positive highly significant correlation (P<0.001) and the highest correlation was with traveling and lifting (**Table 2**).

Table (2): Inter correlation between pain intensity (ODQ), VAS and VDS.

Variable	VAS	VDS
Pain Oswestry		
r	0.629	0.550
P-value	<0.001 **	0.002*
VAS		
r	1.000	0.948
P-value	-	<0.001**
VDS		
r	0.984	1.000
P-value	<0.001**	-

A positive non-significant correlation was found between VAS and both age and BMI, while a negative non-significant correlation was found between VAS and disease duration. A positive significant correlation was found between disability and age, while a positive non-significant correlation was found between disability and both disease duration and BMI **(Table 3).**

Table (3): Correlation between Pain intensity by "VAS" with Total Oswestry Disability Questionnaire.

VAS with	R	P-value
Total Oswestry	0.909	<0.001 **
Personal care	0.754	<0.001 **
Lifting	**0.802**	<0.001**
Walking	0.725	<0.001 **
Sitting	0.723	<0.001 **
Standing	0.610	<0.001 **
Sleep	0.600	<0.001 **
Social life	0.694	<0.001 **
Travel	**0.808**	<0.001**
Changing degree of pain	0.722	<0.001 **

The mean anxiety score and mean depression score were higher in the patient group than in control group; the differences were highly statistically significant (**Table 4**).

Table (4): Mean anxiety and depression scores patients versus control.

Items	Negative (-ve) (0 - 14)		Probable (15 - 19)		Positive (+ve) (20 - 30)	
	Patients	controls	Patients	controls	Patients	controls
Anxiety						
Number	4	21	5	9	21	0
%	13.3%	70%	16.7%	30%	70%	0%
Depression						
Number	6	15	8	12	16	3
%	20%	50%	26.7%	40%	53.3%	10%
Items	Patients (mean)		Controls (mean)		T test	P-value
Anxiety	21.43 ± 6.112		14.17 ± 2.87		5.6	<0.001**
Depression	19.86 ± 6.43		14.3 ± 5.15		3.7	<0.001**

Table 5 compares the studied groups regarding job dissatisfaction by "Modified Work APGAR".

Table (5): Modified Work "APGAR" in patients and control groups.

Grading of job dissatisfaction	Patients		Control		Chi-square	P-value
	No	%	No	%		
Working: Severe (>14)	9	56.25%	6	25	20.33	<0.001**
Moderate (8 - 14)	4	25%	9	37.5		
No (0 - 7)	3	18.75%	9	37.5		
Not working:	14	100%	6	100%	---	

Correlating both pain intensity by VAS and disability with anxiety and depression revealed a non-significant correlation **(Table 6).**

Table (6): Correlation between VAS and total disability with Anxiety and depression.

Variable	(VAS)	Total Disability
Anxiety		
r	0.276	0.300
P-value	0.139	0.107
Depression		
r	0.148	0.142
P-value	0.436	0.455

Correlating pain intensity by VAS with belief and attitude questionnaire revealed a positive significant correlation with emotion and solicitude, a positive significant correlation with disability and harm, and a non-significant correlation with control, medication and medical cure. Correlating total disability Oswestry with belief and attitude questionnaire revealed a positive significant correlation with emotion, a positive significant correlation with disability, harm and solicitude, and a non-significant correlation with control, medication and medical cure **(Table 7).**

Table (7): Correlation between VAS and Total Disability with belief and attitude.

Item of belief and attitude	VAS	Total Oswestry Disability
Control		
r	-0.215	-0.266
P-value	0.253	0.156
Disability		
r	0.820	0.913
P-value	<0.001**	<0.001**
Harm		
r	0.842	0.880
P-value	<0.001**	<0.001**
Emotion		
r	0.446	0.435
P-value	0.013*	0.016*
Medication		
r	-0.13	0.008
P-value	0.946	0.966
Solicitude		
r	0.478	0.570
P-value	0.008*	<0.001**
Medical cure		
r	-0.174	-0.133
P-value	0.368	0.493

Regarding correlation between pain intensity by VAS and coping strategies by chronic pain coping inventory, revealed a positive significant correlation with guarding and resting, a positive significant correlation with asking for assistance and seeking social support, and no significant correlation with relaxation, task persistence, exercise\stretch and coping self-statements. While correlating total Oswestry disability with chronic pain coping inventory revealed a positive significant correlation with guarding, resting, asking for assistance and seeking social support, and no significant correlation with relaxation, task persistence, exercise stretch and coping self- assessment **(Tables 8 and 9)**.

Table (8): Correlation between VAS and Total Disability with belief and attitude.

Item of belief and attitude	VAS	Total Oswestry Disability
Control		
r	-0.215	-0.266
P-value	0.253	0.156
Disability		
r	0.820	0.913
P	<0.001**	<0.001**
Harm		
r	0.842	0.880
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Emotion		
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Solicitude		
r	0.478	0.570
P-value	0.008*	<0.001**
Medical cure		
r	-0.174	-0.133
P-value	0.368	0.493

Table (9): Correlation between VAS and Total Disability with coping strategies.

Coping strategies	VAS		Oswestry disability	
	r	P-value	r	P-value
Guarding	0.697	<0.001**	0.674	<0.001**
Resting	0.577	<0.001**	0.708	<0.001**
Ask for assistance	0.530	0.003*	0.669	<0.001**
\Relaxation	0.161	0.414	0.095	0.630
Task persistence	-0.295	0.113	-0.229	0.223
Exercise\ stretch	-0.030	0.873	0.007	0.972
Coping self-statements	0.105	0.582	0.182	0.335
Seeking social support	0.491	0.006*	0.615	<0.001**

Correlating pain intensity by VAS with locus of control revealed a negative significant correlation with internal locus of control, and a non-significant correlation with external locus of control (whether external chance or external powerful others).While correlating total disability Oswestry with locus of control revealed a negative significant correlation with internal locus of control, a positive significant correlation with external powerful others, and no significant correlation with external chance **(Table 10).**

Table (10): Correlation between VAS and Total Disability with locus of control.

Items	(VAS)	Oswestry Disability
Internal locus of control		
r	-0.434	-0.598
P-value	0.016*	<0.001**
External chance		
r	0.157	0.102
P-value	0.408	0.594
External powerful others		
r	0.231	0.379
P-value	0.218	0.039*

DISCUSSION

Most cases of LBP only last a couple of days at most: It takes roughly six weeks for 80-90% of people to recover from a low back pain episode, and this is true regardless of the treatment's dosage or route of delivery. Findings that demonstrated a weak correlation between pain and disability highlighted the importance of explaining the features of back pain [12].

The pain in the patient group was found to be of moderate intensity, by VAS (mean 5.53; SD 2.14). **Frost and colleagues** [13] looked at 286 people with LBP and found that most of them got a score between 5 and 10 on the low-back-pain.

Chronic LBP sufferers may not be able to verbally express their feelings of fear or annoyances, instead relying more on their body language to convey their emotions, which may help explain why they score so high on anxiety and depression scales compared to a normal control group. Depression and anxiety may be triggered by the immobilizing effects of LBP. Chronic pain may be made worse by the stress of such melancholy and anxiety symptoms.

In the present study, the mean of pain intensity by (VAS) was 5.53 (SD 2.14), pain intensity (in Oswestry disability questionnaire) was 2.10 (SD 0.80), and by VDS was 2.36 (SD 0.85). The results revealed a highly significant positive inter-correlation (P<0.001). In agreement with the present study, was the work of **Underwood and colleagues** [14] who discovered a statistically significant link between pain ratings on the Von Korff scale and measures of functional impairment.

In this study, up on correlating pain intensity by VAS with anxiety and depression revealed a positive non-significant correlation (P values 0.l39 and 0.436, respectively). Also, on correlating disability with anxiety and depression revealed a positive non--significant correlation (P values 0.l1 and 0.46, respectively).

This go in line with **Gatchel and colleagues** [15], Major psychopathology "such as depression" was found to have no correlation with the onset of chronic pain and/or disability. **Carragee and colleagues** [16] study findings indicated that psychosocial characteristics were highly predictive of both long- and short-term impairment in LBP patients.

On correlating pain intensity (VAS) with “Belief and attitude” (SOPA), revealed a highly positive significant correlation with disability and harm (P<0.001), and positive significant correlation with emotion and solicitude (P<0.05). **Walsh and Radcliffe** [17] found that, chronic low back pain patients who had more organic views on the cause and management of their condition also reported greater impairments in physical functioning. Reductions in the perception of organic pain were linked to a lessening of the impairment experienced by the patient. **Symonds and colleagues** [18] that negative attitudes and beliefs are likely to be associated to absence from work owing to low back pain difficulties, and that the influence of psychosocial factors on low back disability is substantial.

On correlating pain intensity (VAS) and disability with coping strategies revealed a highly positive significant correlation with guarding, resting, asking for assistance and seeking social support (P<0.001).

This was consistent with **Weickgenant and colleagues** [19] study on elucidating the characteristics of coping strategies utilised by people with chronic LBP in comparison to healthy controls. The researchers discovered that patients' coping strategies tended toward the passive, avoidant style.

On the contrary, **Lin and Ward** [20] found that, Reporting discomfort, utilizing pain medications, and making coping statements were the top three coping activities. Self-reported pain-coping efficacy inversely associated with actual pain experience. Perseverance of coping effort was positively connected with self-efficacy.

Most patients likely have maladaptive and negative coping techniques, as evidenced by the high rates of guarding, resting, and asking for help, and the low rates of relaxing, task persistence, exercise, seeking social support, and coping self-statements, which may have cultural explanations.

On correlating pain intensity (VAS) with locus of control (MHLC), revealed a negative significant association with the internal locus of control (r= -0.434, P=0.016), and positive non-significant correlation with external locus of control, either external chance or powerful others.

While, correlating disability with locus of control revealed highly negative significant correlation with internal locus of control (r= -0.598, P<0.001) and positive significant correlation with external powerful others (r= 0.379, P=0.0039) and positive non-significant with external chance (r= 0.102, P=0.594), when compared to disability.

Increased external locus of control is associated with more disability as those patients believed in external forces and don’t use internal factors. **Coughlin and colleagues** [21] revealed that, after therapy, patients felt more in charge of their pain than they had before, and that their trust in external sources of pain control, including fate or influential individuals, reduced.

In the present study, job dissatisfaction by “Modified Work APGAR”, showed out of 16 patients working, 9 patients (56.25%) had severe job dissatisfaction, 4 (25%) moderate satisfaction and 3 (18.75%) were satisfied with their jobs, while out of controls, 6 (25%) were severely dissatisfied, 9 (37.5%) moderately dissatisfaction and 9 (37.5%) were satisfied with their jobs.

By Chi-square method, the difference was statistically highly significant (P<0.001). Correlating pain intensity (VAS) and disability with job

dissatisfaction revealed positive non-significant correlation.

In line with **Bigos and colleagues** [22] found that, two-and-a-half times as many people who "hardly ever" appreciated their job responsibilities reported a low back injury as those who "nearly always" enjoyed their work (P<0.001). **Linton and Warg** [23] found that, dissatisfied workers were nearly seven times more likely to experience back pain, and they were more likely to pinpoint employment conditions as the root of their discomfort.

CONCLUSION

Psychological factors interactions are of utmost importance in chronic LBP patients. Hence, their assessment is crucial for any comprehensive evaluation and management of a chronic pain patient. Anxiety and depression were associated with chronic LBP patients. Negative attitudes and beliefs are increasingly. Increased external locus of control was associated with more disability and pain accepted as having an important role in disability related to back problems.

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