RESEARCH ARTICLE

The Evaluation of Low Back Pain Prevalence in First Year of Anesthesiologists' Career; A Cross Sectional Study

Fariborz Mehrani[1], Mahsa Fadaee[1], Sahar Sadat Dehghan Manshadi[1], Parisa Gozali Kalansara[1], Kosar Ahmadi[1], Amirhossein Orandi[2]*, Jayran Zebardast[3], Ali-Akbar Nejatisafa[4], Saeed Khorramnia[2], Negar Eftekhar[2], Hossein Majedi[2]

Background: Low Back Pain (LBP) is a common musculoskeletal disorder which may have an occupational or non-occupational etiology and is seen in many health care providers. It is an important cause of morbidity and workplace absence. Various factors may result in LBP but the role of occupational stress and anxiety personality disorder is still unclear.

Methods: Face-to-face interviews were conducted with 58 anesthesiologists working in the hospitals of Tehran University of Medical Sciences to evaluate the occurrence of LBP in the first year of work. The probable causes of LBP and the level of anxiety were assessed using a questionnaire designed for this purpose, based on Spielberger state-trait anxiety inventory (STAI), and the results were analyzed.

Results: Of 58 participants, 44 (75.9%) were men and 14 (24.1%) were women. The mean age of the participants was 45.6±6.3 years. Twenty-four of 58 participants (41.4%) reported LBP in the first year of work. Six participants (10.3%) did not have anxiety state but had LBP in the first year of work. Eighteen subjects (31%) with mild to severe anxiety state also had LBP in the first year of work. Nine anesthesiologists (15.5%) did not have anxiety trait but had LBP in the first year of work. Fifteen participants (25.8%) had mild to severe anxiety trait and had LBP in the first year of work.

In general, 24 of 58 participants (41.4%) with an anxiety score of 47.52 (moderate level of anxiety) had LBP, and 34 of 58 participants with an anxiety score of 41.01 (moderate level of anxiety) did not have LBP. There was a significant correlation between the occurrence of LBP and the level of anxiety (P=0.014).

The personality type, smoking, history of psychiatric disorders, occupational satisfaction, communication with colleagues, sleep quality, history of LBP during work years, especially in the first year, duration of LBP, stress in the first year of work, and weekly hours of exercise had a significant association with anxiety (P<0.05).

Conclusion: LBP is a multi factorial disorder of human. It seems that LBP can be related to stress and mechanical factors.

Keywords: low back pain; anesthesiologist; anxiety; occupational stress

Low Back Pain (LBP) is any pain or discomfort in the lumbar spine (between the inferior costal margin and the gluteal region) with or without radiation to legs at least once during the past 12 years (regardless of menstrual pains and pains related to the genitourinary system, surgery,

cancer, and vascular disorders) [1].

About 75-90% of the patients with LBP recover within 6 weeks, and 10-25% of the remaining patients are prone to develop chronic LBP. Chronic LBP is a pain that persists beyond 3 months. LBP is now a modern international epidemia experienced by more than 80% of people at least once during their lifetime. After upper respiratory tract infections, LBP is the second cause of doctor's visits, third cause of surgery, and fifth cause of hospitalization. The cause of most chronic LBP is not yet clear, and it is the most common cause of activity limitation in people below 45 years of age according to National Center for Health Statistics of the United States [1-2].

Different factors like inflammation of fibrous tissue, spinal disc herniation, joint inflammation, rheumatic diseases, etc. may cause LBP. It is one of the most common musculoskeletal disorders that imposes heavy direct and indirect costs on industrial and non-industrial societies and results in workplace absence. Studies have shown that the prevalence and incidence of LBP is 60-80% and 12-68%,

respectively [1-2].

LBP is the most common workplace-related musculoskeletal disorder. More than 50% of the manpower is lost for at least 1 day due to LBP, and occupation and resuming work is one of the factors causing anxiety and depression in some of these patients [2]. In addition to physical problems leading to backache, psychological factors like stress and anxiety may also cause LBP [3].

Methods

In this cross-sectional study, 58 anesthesiologists of Tehran University of Medical Sciences underwent face-to-face interview after obtaining their informed consent. Those who were not willing to participate or sign the consent form were excluded from the study.

The inclusion criterion was being a faculty member of Tehran University of Medical Sciences and the exclusion criteria were unwillingness to participate in the study or signing the consent forms.

The data were assessed consecutively and meticulously and the distribution of the variables was determined. The SPSS version 22 was used for data analysis.

Quantitative data are presented as mean ± standard deviation and qualitative data are shown as frequency and frequency percentage. P values less than 0.05 were considered to be significant. Parametric and non-parametric tests were used for the analyses of data with a normal and non-normal distribution, respectively. If the data had a normal distribution, chi-square, t-test, and ANOVA were applied.

To evaluate the level of anxiety in the participants, the Speilberger State-Trait Anxiety Inventory (STAI) was used to categorize the subjects in the following groups: no anxiety state, mild anxiety state, moderate anxiety state, severe anxiety state, no anxiety trait, mild anxiety trait, moderate anxiety trait, and severe anxiety trait. (Table 1) [4-6].

To calculate the score of the participants in each scale, since some statements were scored in reverse, the total score of 20 statements in each scale was calculated. Therefore, the total score of either scale (anxiety trait and anxiety state) ranged from 20 to 80 [4-6].

High anxiety state: These people feel frightened, concerned, and nervous. They are unhappy and feel tense consciously. They report autonomous nervous system hyperactivity.

High anxiety trait: These people perceive many situations as threatening and dangerous. They are especially worried that other people's judgment may stain their self-dignity.

High anxiety state, low anxiety trait: The anxiety that these people report may originate from some external threats or available stressors; therefore, they may resolve spontaneously. If an intervention is required, strategies leading to decreased arousal like increased social support, regular desensitization, assurance, hypnosis, exercise, and meditating or learning progressive détente should be applied. Moreover, it is possible to use what they have learned from anxiety and ways to decrease it to help them to reduce their anxiety in the future.

Low anxiety state, high anxiety trait: Although these people do not report anxiety, they are prone to anxiety reactions in anxiety-provoking situations. They may be worried about their self-dignity being threatened by others,

and therefore feel uncomfortable in situations where they may be judged by others.

Table 1- Anxiety state - trait scoring score table

scale	Level	scores
Anxiety state	None or minimum	20-30
	mild	31-42
	moderate	43-53
	severe	54 and more
Anxiety trait	None or minimum	34-20
	mild	45-35
	moderate	46-56
	severe	57 and more

Results

Of 58 participants, 44 (75.9%) were men and 14 (24.1%) were women. The mean age of the participants was 45.6±6.3 years. Demographic characteristics of the participants are being presented (Table 2-3).

Table 2- Demographic characteristics of the statistical population

		Frequency	Percent
Gender	Male	44	75.9
	Female	14	24.1
Education	Specialist	50	86.2
	Fellowship	8	13.8
Marital status	Single	5	8.6
	Married	53	91.4
Starting place of work	ICU	5	8.6
	Operating room	22	37.9
	ICU+ Operating room	31	53.4
Employment place	ICU	3	5.2
	Operating room	29	50.0
	ICU+ Operating room	26	44.8

Twenty-four of 58 participants (41.4%) reported LBP in the first year of work. In the first year of work, 18 subjects (31%) did not have anxiety state, 31 (53.4%) had mild anxiety state, 7 (12.1%) had moderate anxiety state, and 2 (3.4%) had severe anxiety state. Moreover, 27 of 58 participants (46.6%) did not have anxiety trait, 26 (44.8%) had mild anxiety trait, 3 (5.2%) had moderate anxiety trait, and 2 (3.4%) had severe anxiety trait. LBP in the first year of work was seen in 6 of 18 (33.3%) participants with no

anxiety state, 15 of 31 (48.4%) participants with mild anxiety state, 2 of 7 (28.6%) participants with moderate anxiety state, and 1 of 2 (50%) participants with severe anxiety state.

LBP in the first year of work was seen in 9 of 27 (33.3%) participants with no anxiety trait, 13 of 26 (50%) participants with mild anxiety trait, 1of 3 (33.3%) subjects with moderate anxiety trait, and 1of 2 (50%) participants with severe anxiety trait.

In general, 24 of 58 participants (41.4%) with an anxiety score of 47.52 had LBP, and 34 of 58 participants with an anxiety score of 41.01 did not have LBP. There was a significant correlation between the occurrence of LBP and the level of anxiety (P=0.014).

There was a significant correlation between anxiety and the personality type, smoking, history of psychiatric disorders, occupational satisfaction, communication with colleagues, sleep quality, history of LBP during work years especially in the first year, causes of LBP according to the patient report, duration of LBP, stress in the first year of work, and weekly hours of exercise (P<0.05); presented in (Table 4).

average percentage of anxiety questionnaire in 34 who have not had LBP was 41.01±7.45, in6 patients with failure to comply with ergonomic principles was 52.18±11.65,in 6 patients with lumbar problems (lumbar spine degeneration, discopathy, sciatica) was 41.97±9.98 , in 4 patients with fatigue and over work was 39.68±7.50 and in 8 patients with anxiety, trauma, spasm failure to comply with ergonomic principles-fatigue and abundance of workload, failure to comply with ergonomic principles-physical disability, failure to comply with ergonomic-stress principles , congenital - anxiety , failure to comply with ergonomic principles-fatigue and abnormal work-stress-spasm were 58.12, 76.25, 48.12,51.87, 38.75, 59.37 and 52.50 retrospectively. So average percentage of anxiety questionnaire due to these causes of LBP according to patient report had significant difference (p=0.002)

There was no significant correlation between the mean percentage of the STAI score and factors like sex, educational level, number of children in the past, current number of children, marital status, working shifts in the past, current work shifts, current workplace, workplace in the past, ICU work hours in the past, current ICU work hours, work hours in the operation room in the past, current work hours in the operation room, sports in the past, current sports activities, medical condition in the past, medical disease(s) in the past, current medical condition, current medical disease(s), reason(s) for the current medical disease(s), observation of ergonomic principles in the past, observation of ergonomic principles at the present time, time off after shifts in the past, time off after shifts at the present time, participation in non-medical activities in the past and at the present time, occupational satisfaction at the present time, communication with colleagues in the past, communication with patients' companions in the past, communication with patients' companions at the present time, sleep quality in the past, total sleep per 24 hours in the past, total sleep per 24 hours at the present time, congruence of the workload and rest in the past, congruence of the workload and rest at the present time, work experience as an anesthesiologist, LBP relapse, LBP quality, solutions to improve LBP, LBP at the present time or in the past 12 months, number of LBP episodes, LBP outcomes, stress in the first year of work, level of stress, and actions to reduce stress (P>0.05).

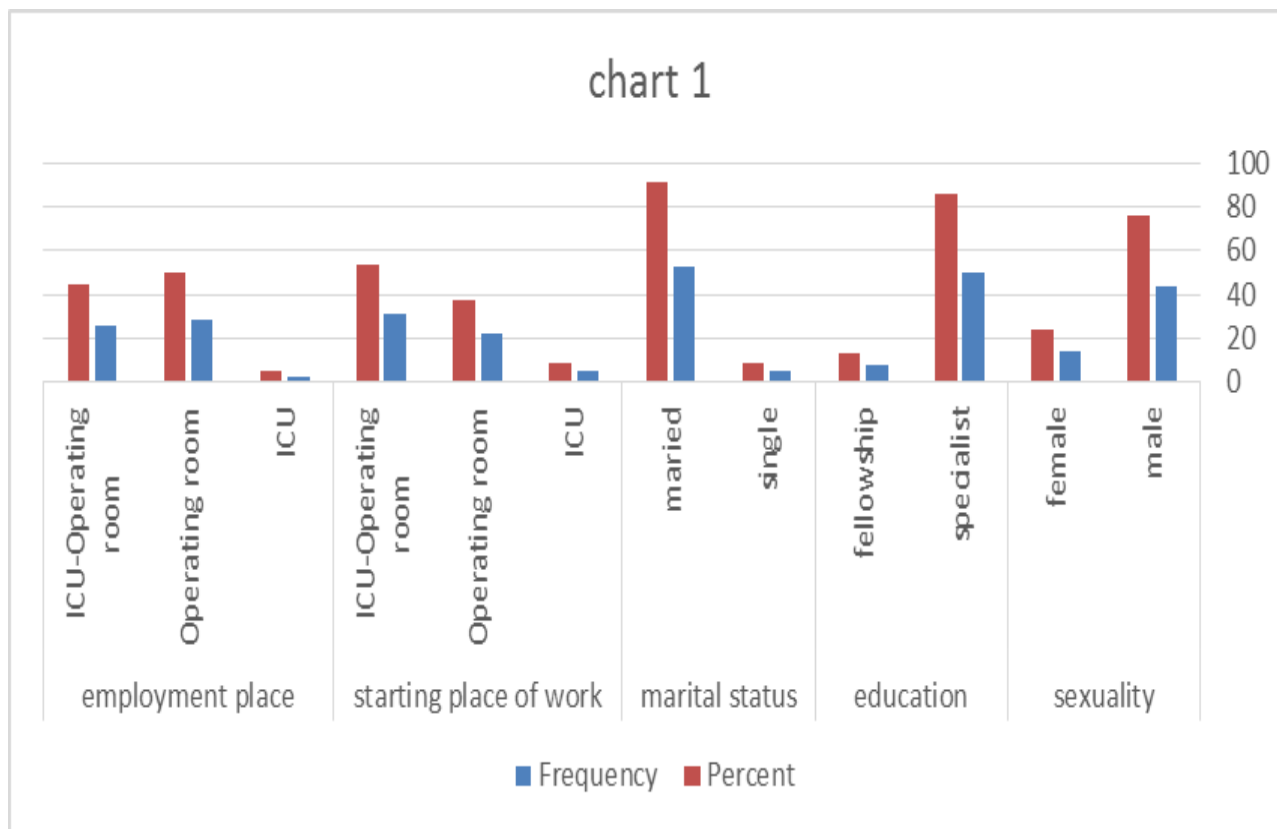**Chart 1- Demographic characteristics of the statistical population**

Table 3- The average percentage score of anxiety questionnaire based on gender, education, marital status, starting place of work and place of employment

		Frequency	Mean (%)	P value
Gender	male	44	71.4±17	P:0.1
	female	14	65±11.8	
Education	specialist	50	69.7±14.6	P:0.8
	fellowship	8	70.8±24.8	
Marital status	single	5	77.6±25.5	P:0.2
	Married	53	69.2±15.1	
Starting place of work	ICU	5	63.6±14.2	P:0.49
	Operating room	22	72.5±15.4	
	ICU+ Operating room	31	69±16.9	
Employment place	ICU	3	60±11.7	P:0.35
	Operating room	29	68.5±15.9	
	ICU+ Operating room	26	72.6±16.5	

Table 4- The evaluation of the correlation between average percentage of anxiety questionnaire based on personality type, smoking, psychiatric illness, job satisfaction, relationship with colleagues, sleep quality, LBP during work experience especially the first year, cause of LBP, phase length of LBP, the cause of LBP at the present or in the last 12 months, stress in the first year of the beginning of work and hours of exercise per week by the person himself

		Mean ±Std. Deviation	Frequency	P value
The person's personality type in his own judgment	Calm	41.84±8.11	48	0.01
	Anxious	52.62±13.86	10	
Smoking in the past	Yes	52.05±12.47	7	0.018
	No	42.56±9.26	51	
Smoking at present	Yes	57.18±14.88	4	0.005
	No	42.70±9.04	54	
psychiatric illness in the past	Yes	63.54±11.22	3	<0.001
	N0	42.62±8.91	55	
psychiatric illness at present	Yes	42.08±9.29	48	0.014
	No	55.31±15.05	4	
	No idea	48.95±6.50	6	
relationship with colleagues at present	Good	42.61±10.26	50	0.037
	Moderate	50.54±5.11	8	
sleep quality at present	Good	41.07±7.64	28	0.001
	Moderate	43.70±9.95	25	
	Weak	58.50±11.56	5	
LBP during work experience especially the first year	Yes	47.52±12.07	24	0.014
	No	41.01±7.45	34	

Table 4- The evaluation of the correlation between average percentage of anxiety questionnaire based on personality type, smoking, psychiatric illness, job satisfaction, relationship with colleagues, sleep quality, LBP during work experience especially the first year, cause of LBP, phase length of LBP, the cause of LBP at the present or in the last 12 months, stress in the first year of the beginning of work and hours of exercise per week by the person himself (Continued)

		Mean ±Std. Deviation	Frequency	P value
phase length of LBP	Have not had LBP	41.01±7.45	34	0.005
	Less than one month	47.91±10.61	18	
	Less than one year old	32.18±2.20	2	
	More than a year	53.43±16.53	4	
the cause of LBP at present or in the last 12 months	Have not had LBP	42.73±2.22	35	0.020
	Failure to comply with ergonomic principles	44.01±8.16	7	
	Lumbar problems (lumbar spine degeneration,discopathy,sciatica)	38.22±9.33	6	
	Fatigue and abundance of work	38.43±0.44	2	
	Stress	58.12	1	
	Trauma	38.12	1	
	Metabolic disorders	40.62	1	
	Fatigue and abundance of work	50.00	1	
	Anxiety	59.37	1	
	Trauma	76.25	1	
	Obesity	51.25±8.83	2	
Stress in the first year of the beginning of work	Yes	43.77±10.17	52	0.005
	No	43.12±9.98	6	
Exercise in the past	Yes	44.19±10.64	48	0.42
	No	41.37±6.58	10	
Exercise at the present	Yes	42.78±8.14	29	0.48
	No	44.63±11.76	29	

Discussion

The aim of the present study was to evaluate the presence or absence of any relationship between anxiety and LBP during work years, especially the first year of work. The Speilberger State-Trait Anxiety Inventory (STAI) was used to determine the anxiety level of the participants (anxiety trait-state), and a demographic questionnaire was applied to assess the effect of possible factors on the development of LBP [4-6]. The factors were selected with regards to available previous studies[1,3,7-15], but a number of factors like number of shifts per month in the first year and at the present time, age at the start of working as an anesthesiologist, the participants' perception of their personality type, time off after each shift in the first year and at the present time and whether they went to work the following morning, duration of the LBP phase, LBP relapse, LBP quality, solutions to improve LBP, LBP outcomes, actions to reduce anxiety and stress were less frequently evaluated in previous studies. In this regard, we found a

significant correlation between anxiety and the personality type (P: 0.01) and duration of LBP phase (P:0.005).

In general, 24 of 58 participants (41.4%) with an anxiety score of 47.52 had LBP, and 34 of 58 participants with an anxiety score of 41.01 did not have it. There was a significant correlation between the occurrence of LBP and the level of anxiety (P: 0.014).

Compared with Manchikanti et al. [16], we found that smoking in the past and at present was significantly correlated with the development of anxiety and LBP.

We also found a significant association between psychiatric diseases at the present time and the development of LBP and anxiety, which was consistent with the results of previous studies [16-22].

Similar to previous investigations [17,19,20,23,24], we also noted a significant relationship between occupational satisfaction in the past and the development of anxiety and LBP.

Our results showed that the quality of communication with

colleagues at the present time was significantly associated with the development of anxiety and LBP, as reported in previous studies [21,23].

In our study, the participants attributed LBP to factors like ignoring ergonomic principles, lumbar problems (disc degeneration, discopathy, disc herniation, etc.), fatigue, heavy workload, stress, trauma, spasm, overweight, and metabolic disorders, which were indeed associated with the development of LBP and anxiety. Previous studies have also reported similar findings [7-13,15-19,21,24-26].

Similar to previous studies [3,11,12,14,17,19,22,23,25,26], we found a significant association between stress and LBP.

Compared with the results of previous investigations [10, 16,27,28], we also noted that lack of exercise is effective in the development of LBP.

In our study, current sleep quality, LBP in the first year of work, person's judgment of his/her own type of personality, and duration of the LBP phase were significantly associated with anxiety and LBP. These associations were also investigated in previous studies [3,29].

We found a non-significant inverse association between age and the level of anxiety (Pearson correlation coefficient: -1.89, level of significance:0.15), which is consistent with the results of a study by Kane et al. in 2009-2013 but inconsistent with the findings of some other studies [7,8,15,16,26,30,31].

We found no significant association between sex and the development of anxiety and LBP although some previous studies have reported a significant association [8,14,26,28].

Contrary to Nasiri Zarrin Ghabaee et al. [26] neither we nor Ranjana Khetapel [28] found a significant relationship between marital status and LBP development.

We found no association between workplace and anxiety and LBP development despite some positive reports in this regard [8].

Conclusion

LBP is a multifactorial problem of humans. Along with advances in science and technology, life stressors have increased and people have less time for improving mechanical factors like exercise, maintenance of correct posture, etc. It seems that LBP can be related to stress and mechanical factors.

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