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General Health of Healthcare Professionals With Low Back Pain

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ABSTRACT

Background: Low back pain (LBP) is a leading cause of morbidity in the healthcare profession. It is a complex problem of the biopsychosocial factors (BPS) effect, where processing mechanisms affect the experience of pain, function, participation in society and personal prosperity. Psychological factors are important predictors of poor outcomes because they can significantly influence pain management and coping. **Objective:** To determine the prevalence of psychological factors, the difference in general health and the tendency toward psychological dysfunction of healthcare professionals with low back pain at different levels of healthcare system. **Methods:** A cross-sectional study was conducted in five primary, secondary and tertiary level healthcare institutions in Boka Kotorska, Montenegro (December 2021 - July 2022). The study involved 192 subjects with LBP who voluntary entered the study and met the inclusion criteria. The study instrument was the General Health Questionnaire (GHQ-12), which provides information on mental health by identifying symptoms of distress. The data were analyzed using the $\chi 2$ test with a statistical significance limit of $p<0.05$. **Results:** The study included n=67 (34.9%) respondents working at secondary level, n=63 (32.8%) at the primary level and n=62 (32.3%) working at tertiary level, predominantly female. Analysis of the psychological factors representation indicate significant differences in overcoming difficulties (p=0.05), enjoyment in daily activities (p=0.042) and feelings of happiness and progress (p=0.004). There were statistically significant differences in general health and in the tendency to psychological dysfunction (p=0.005). Tendency to somatic symptoms is most prevalent at primary (55.6%) and tertiary (51.6%) healthcare level. Respondents working at Secondary level showed a tendency towards social dysfunction, anxiety and depression (50.7%, 17.9% and 3%). **Conclusion:** Psychological factors are represented differently in the healthcare profession. A statistically significant difference was found among healthcare professionals of the examined levels, especially in the feeling of inability to overcome difficulties, enjoyment in usual daily activities, and feeling of happiness and progress. There is also a significant difference in the representation of psychological dysfunction at the primary, secondary and tertiary levels of healthcare, while general health is most impaired among healthcare professionals working at the secondary level.

Keywords: health workers, mental disorders, frequency.

1. BACKGROUND

Low back pain is a symptom with many causes. It is the most common musculoskeletal disorder and the main cause of suffering, disability and reduced quality of life of the working population (1). In the past decades, it has become one of the leading causes of disease burden in developed and developing countries and is one of the leading causes of morbidity in the healthcare profession with a prevalence of 60%-70% (2, 3).

Low back pain is a complex problem of the biopsychosocial factors (BPS) interaction in which processing mechanisms affect the experience of pain, function, participation in society and personal prosperity. It is a complex state of biological, psychological and social factors where comorbidities and processing mechanisms affect the experience of pain, function, participation in society and personal prosperity (4, 5). The biopsychosocial model of pain emphasizes that sensory inputs, cognitive factors and emotional

mechanisms modulate and trigger pain, and the difference is not only related to the pain duration, but also to the assumed biopsychosocial factors that cause and maintain it (6). Biological factors are important, but recent studies reduce their importance and do not always give them a decisive role in etiopathogenesis, because psychological factors play a greater prognostic role (7, 8). Psychological factors are represented differently in the healthcare profession and affect the general health of healthcare professionals.

Psychological factors of pain are important determinants that predict poor outcomes and have a strong influence on pain management and coping (9). They relate to cognition, emotions, behavior and perceived control (10). They are influenced by a series of processes starting from the initial awareness of the noxious stimulus, cognitive processing, evaluation and interpretation and lead people to act in accordance with their pain (11). Experienced pain is influenced by personality traits, emotional states, thoughts and beliefs, and in people with low back pain, the influence of increased stress and the presence of anxiety and depressive symptoms that lead to a worsening of the physical condition is crucial (12). Psychological factors are different, they are represented differently and can be an important determinant of the general health of healthcare professionals.

2. OBJECTIVE

The aim of this study is to determine the prevalence of psychological factors, the difference in the general state of health and the tendency to psychological dysfunction of healthcare professionals with low back pain working at different levels of healthcare system.

3. MATERIAL AND METHODS

A cross-sectional survey was conducted among healthcare professionals employed at primary, secondary and tertiary level healthcare institutions in Boka Kotorska (Montenegro) in the period from December 2021 to July 2022. Five healthcare institutions were included in the study: from the primary level Primary healthcare Center Herceg Novi and Primary healthcare Center Kotor, from the secondary level Special Hospital "Vaso Ćuković" Risan and General Hospital Kotor, and from the tertiary level the Institute for Physical Medicine, Rehabilitation and Rheumatology "Dr. Simo Milošević" Igalo, with the approval of the Ministry of Health of Montenegro, the consent of the administrations or ethical committees of these healthcare institutions and the consent of all respondents, and in accordance with all ethical principles, this research included 192 respondents of various profiles. The inclusion criteria were: age 19-65 years, permanent employment and low back pain. All respondents who met the inclusion criteria were included in the total sample. Depending on the healthcare level, the sample is classified into three groups: primary, secondary and tertiary level.

The research instrument used to assess general health, was the 12-Item General Health Questionnaire - GHQ-12. This questionnaire has important psychometric properties because it detects mental disorders such as depression, anxiety and somatic disorders (13). There are six positive and six negative items related to the individual's life in the last few weeks. The positive items were formulated as: "Have you recently been able to concentrate on what you are doing?" and the negative items: "Have you recently felt that you could not overcome all your difficulties?", as well as the answers "always, often, sometimes and never. Scoring is done on a 0-3 Likert scale, and the total score is 0-36, where higher scores indicate worse general health. The obtained data were analyzed in order to assess the general health and possible tendency to social, depressive, anxiety and somatic symptoms. Positive items were ranked as 0 (always), 1 (often), 2 (sometimes) and 3 (never). Negative items are ranked from 3 (always), 2 (often), 1 (sometimes) and 0 (never) and refer to questions 2, 5, 6, 9, 10 and 11 (14, 15).

The obtained data were analyzed using the method of descriptive and comparative statistics, the results were presented tabularly, through the number of cases and percentages. Nominal and ordinal variables were analyzed using the chi-square test. A value of $p<0.05$ was taken as the limit of statistical significance. Statistical analysis was performed using the statistical package for sociological research IBM Statistics SPSS v 23.0 (Chicago, Illinois, USA).

4. RESULTS

Primary level, the study included 48 (25%) respondents from Primary healthcare Center Herceg Novi and 15 (7.8%) respondents from Primary healthcare Center Kotor, from the secondary level 45 (23.4%) respondents from Kotor General Hospital and 22 (11.5%) of respondents from the Special Hospital "Vaso Ćuković" Risan, and 62 (32.3%) tertiary level respondents are from the Institute for Physical Medicine, Rehabilitation and Rheumatology "Dr. Simo Milošević" Igalo.

The analysis of the gender structure showed a significant difference in gender because the female gender is dominant. Secondary level respondents are on average the youngest, and primary level respondents are the oldest.

They can always concentrate on what they are doing (n=111) or 57.8% of respondents, often concentrate on work (n=60) or 31.3% of respondents, sometimes concentrate (n=19) or 19.9% respondents, and can never concentrate on work (n=2) or 1% of respondents.

Concentration on work is mostly always present in 61.2% of secondary level respondents, it is frequent in 39.7% of primary level respondents, sometimes 11.9% of secondary level respondents have it and never in 3.2% of tertiary respondents, but there is no statistically significant difference between the examined groups ($\chi 2=7,830$; $p=0,251$).

The majority (n=26) or 41.9% of tertiary level respondents always have a useful role in the environment, it is common among (n=27) or 42.9% of primary

Do you feel that you cannot overcome all your difficulties?	Healthcare level N(%)			Total
	Primary	Secondary	Tertiary	
Always	18 (28,6)	11 (16,4)	15 (24,2)	44 (22,9)
Often	38 (60,3)	31 (46,3)	30 (48,4)	99 (51,6)
Sometimes	4 (6,3)	16 (23,9)	11 (17,7)	31 (16,1)
Never	3 (4,8)	9 (13,4)	6 (9,7)	18 (9,4)
Total	63 (100,0)	67 (100,0)	62 (100,0)	192 (100,0)

Table 1. Overcoming difficulties

Can you enjoy your usual daily activities?	Healthcare level N(%)			Total
	Primary	Secondary	Tertiary	
Always	20 (31,7)	20 (29,9)	29 (46,8)	69 (35,9)
Often	31 (49,2)	27 (40,3)	23 (37,1)	81 (42,2)
Sometimes	9 (14,3)	20 (29,9)	9 (14,5)	38 (19,8)
Never	3 (4,8)	0 (0,0)	1 (1,6)	4 (2,1)
Total	63 (100,0)	67 (100,0)	62 (100,0)	192 (100,0)

Table 2. Enjoyment of daily activities $\chi 2=13,091$; p=0,042

level respondents (Table 1).

The majority of tertiary level respondents (n=29) or 46.8% enjoy their usual daily activities, and among (n=31) or 49.2% of primary level respondents this feeling is common. The majority of secondary level respondents (n=20) or 29.9% sometimes enjoy their daily activities, and they never enjoy (n=3) or 4.8% of primary level respondents. There is a statistically significant difference $\chi 2=13.091$; p=0.042 in the question "Can you enjoy your usual daily activities?", because 1.6% of tertiary level respondents, 4.8% of primary level respondents never enjoy their usual daily activities, and this answer is absent from secondary level respondents (Table 2).

The largest part (n=40) or 63.5% of primary level respondents can always face their problems, and the smallest part is

level respondents, this feeling is sometimes felt by (n=18) or 26 .9% of secondary level respondents, but never present in (n=2) or 3.2% of primary level respondents. There is no statistically significant difference in the feeling of a useful role in the environment among the examined groups ($\chi 2=3,912$; p=0,689).

The analysis of emotional strain showed that emotional strain is always present (n=24) or 12.5% of respondents, it is frequent in (n=58) or 30.2% of respondents, occasional emotional strain is present (n=97) or 50.5 % of respondents, and (n=13) or 6.8% of respondents never feel emotional strain. The majority of secondary level respondents (19.4%) are always under emotional stress, and 34.9% of primary level respondents are often under emotional stress. Sometimes, 59.7% of respondents of the tertiary level have a feeling of emotional effort, and 9.7% of respondents of the same level never, but no significant difference in the feeling of emotional effort was found among the examined levels ($\chi 2=10,261$;p=0,114).

Have you been feeling unhappy and depressed?	Healthcare level N(%)			Total
	Primary	Secondary	Tertiary	
Always	27 (42,9)	32 (47,8)	31 (50,0)	90 (46,9)
Often	33 (52,4)	26 (38,8)	26 (41,9)	85 (44,3)
Sometimes	1 (1,6)	6 (9,0)	3 (4,8)	10 (5,2
Never	2 (3,2)	3 (4,5)	2 (3,2)	7 (3,6)
Total	63 (100,0)	67 (100,0)	62 (100,0)	192 (100,0)

Table 3. Feeling depressed

Psychological dysfunction	Healthcare level N(%)			Total
	Primary	Secondary	Tertiary	
Somatic symptoms	35 (55,6)	19 (28,4)	32 (51,6)	86 (44,8)
Anxiety	26 (41,3)	34 (50,7)	25 (40,3)	85 (44,3)
Social dysfunction	2 (3,2)	12 (17,9)	5 (8,1)	19 (9,9)
Depression	0 (0,0)	2 (3,0)	0 (0,0)	2 (1,0)
Total	63 (100,0)	67 (100,0)	62 (100,0)	192 (100,0)

Table 4. General health - Psychological dysfunction

The smallest part of secondary level respondents (n=11) or 16.4% never have the feeling that they cannot overcome all their difficulties. This feeling is the highest among (n=18) or 28.6% of primary level respondents. The feeling that difficulties often cannot be overcome is the most common among (n=16) or 23.9% of secondary level respondents, and the least common among (n=3) or 4.8% of primary level respondents.

There is a significant difference $\chi 2=12.518$; p=0.05 in the question "Have you ever felt that you could not overcome all your difficulties?" because the answer "always" was given by 9.7% of tertiary level respondents, the answer "often" by 23.9% of secondary level respondents, the answer "sometimes" 60.3% of primary level respondents, and the answer "never" 24.2% of tertiary

often observed with their problems (n=17) or 25.4% of secondary level respondents. The smallest part of primary level respondents (n=3) or 4.8% sometimes face their problems, and the largest part of tertiary level respondents (n=2) or 3.2% can never face their problems, but there is no statistically significant differences in facing their problems?" among the examined levels ($\chi 2=7,558$;p=0,272).

The majority of secondary level respondents (n=32) or 47.8% never feel unhappy and depressed, the majority of primary level respondents (n=33) or 52.4% are sometimes unhappy and depressed, often unhappy and depressed (n=6) or 9% of respondents of secondary level, and (n=3) or 4.5% of respondents of this level are always unhappy and depressed, but there is no significant difference $\chi 2=5.426$; p=0.491 in unhappy and depressed feeling among the examined levels (Table 3).

For the most part, 38.7% of respondents at the ter-

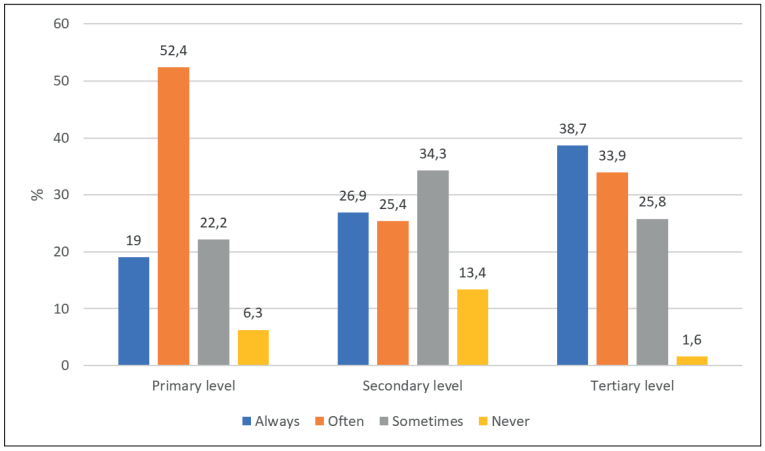

Figure 1. Feeling of happiness and progress

tiary level always have the feeling that everything was better than usual. The feeling of happiness and progress is often experienced by 52.4% of respondents at the primary level, and is sometimes represented by 34.3% of respondents at the secondary level. 13.4% of secondary level respondents never feel happy. The analysis of feelings of happiness and progress showed a statistically significant difference $\chi 2=19.112$; $p=0.004$ because 52.4% of primary level respondents are often happy and everything was better than usual, 33.9% of tertiary level respondents and 25.4% of secondary level respondents (Chart 1).

Propensity to somatic symptoms was shown by the majority of respondents from the primary level (n=35) or 55.6%, followed by (n=32) or 51.6% of respondents from the tertiary level, and the least (n=19) or 28.4 % of secondary healthcare respondents. Among respondents at the secondary level, the majority of respondents (n=34) or 50.7% showed a tendency towards anxiety, (n=12) or 17.9% of respondents had a tendency towards social dysfunction, and 3% of respondents had a tendency towards depressive symptoms.

The analysis of psychological dysfunction showed that (n=86) or (44.8%) of the subjects exhibited somatic symptoms. Tendency to anxiety is shown by (n=85) or (44.3%) respondents, tendency to social dysfunction (n=19) or (9.9%) respondents, and (n=2) or (1%) respondents show tendency to depressive symptoms. There is a statistically significant difference $\chi 2=18,461$; $p=0.005$ in psychological dysfunction between subjects at the primary, secondary and tertiary levels.

5. DISCUSSION

Low back pain is one of the most challenging problems faced by healthcare professionals and represents a great psychological burden. Psychological factors can manage pain, they are the process of the effects of a harmful stimulus, cognitive processing, evaluation and interpretation because they lead people to act in accordance with their pain (9, 16).

The comparison between the examined levels of healthcare showed the existence of significant differences in the representation of psychological factors. The analysis of general health recognized healthcare professionals at the secondary level as the riskiest group exposed to psychological factors because 50.7% of respondents had a tendency to anxiety, 17.9% of respondents to social dysfunction, and 3% of respondents showed a tendency to depressive symptoms. The results of this research are in line with literature evidence. Linton and Al Amer claim that anxiety, mood, stress and worry are associated with low back pain, and health professionals employed in hospitals are more susceptible to developing LBP due to the emotional factors involved in their occupations (11, 17).

An epidemiological study conducted by Comotti et al. among 990 healthcare professionals aimed to assess the psychological well-being of healthcare professionals. Analysis of the GHQ-12 classified 47% of respondents with general well-being, 38% of respondents with pronounced signs of psychological discomfort, and 15% of respondents with a high level of psychological dysfunction (18).

An observational longitudinal study conducted in 2020 to systematically examine the psychological status of 550 professionals from a University Hospital in Italy showed that 39% of respondents had general psychological discomfort. Respondents of female sex, younger age showed greater mental impairments compared to other colleagues (19). Our data correlates with this research. In our sample, the female gender is more prevalent, and psychological dysfunction is most prevalent in secondary level respondents, who are on average the youngest.

Examining the connection between psychological factors and LBP, Bener et al observed anxiety in 9.5% of people with LBP, depression in 13.7%, and somatization in 14.9% (20). In our study, the tendency to somatic symptoms was most prevalent in subjects of the primary level (55.6%) and tertiary level (51.6%), and was least represented in subjects of the secondary level (28.4%). Coggon et al argue that somatization predisposes to worry, is associated with various aspects of health and health-related behaviors, and includes musculoskeletal pain (21). Vargas-Prada et al. are of a similar opinion because they say that pain and somatization are related, somatization is a predictor and not a consequence of other aspects of health (22).

Examining the connection between low back pain and the influence of psychosocial factors on the work of 280 professionals employed in hospitals, Yoshimoto et al identified somatic symptoms as an important factor in 17.7% of respondents. This group of authors claims that the tendency to somatize is a type of stress response, and LBP is related to interpersonal stress at work. Somatization and LBP correlate, so this problem should not be approached as a musculoskeletal disorder but as a psychological dysfunction (23).

In our study, 41.3% of primary level respondents, 50.7% of secondary level respondents and 40.3% of tertiary level respondents showed a tendency towards

anxiety. Michael et al. and Vinstrup et al. claim that anxiety and depression are common psychological changes in LBP and negatively affect mental status, because people with depressive symptoms are more likely to develop chronic back pain than those without depressive symptoms (24,25). Han and Pae believe that the simultaneous occurrence of pain and depression is influenced by neurological mechanisms, because the mood response to a painful physical stimulus is caused by serotonin and norepinephrine in the brain (26). Katsuhirai et al state that greater physical work increases the compressive strength of the low back during work activities, and high rates of comorbidity of somatization, depression, anxiety, and stress are associated with LBP (27). Our research is in accordance with the previous data, because the respondents of the secondary level had the highest prevalence of anxiety, and only the respondents of this level showed depressive symptoms.

Løchting says that individual pain perception and condition-specific outcomes are relevant indicators of improvement in the psychological aspect of health (28). Mental health is key in the personal and social development of an individual, and good mental health is "a state in which an individual realizes his abilities", has an essential value and is aimed at a better perception of life (29).

6. CONCLUSION

Psychological factors are represented differently in the healthcare profession. A statistically significant difference was found in the feeling of inability to overcome difficulties, enjoyment in usual daily activities and feeling of happiness and progress among healthcare professionals of the examined levels. There is also a statistically significant difference in general health in the primary, secondary and tertiary levels of health care, and general health is most threatened among healthcare professionals at the secondary level.

ABBREVIATIONS: LBP - low back pain, BPS - biopsychosocial factors, GHQ-12- The General Health Questionnaire

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