Low back pain (LBP) is defined as pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with or without leg pain. Nonspecific (common) low back pain is defined as low back pain not attributable to a recognizable, known specific pathology [1–4]. Back pain is a common phenomenon with a great impact on the public health. It has been determined that more than 80% of the world’s population will have at least one episode of low back pain during their lifetime [2–4]. LBP has an incidence of about 5% per year and accounts for about 3% of emergency department visits in the United States [5]. Although the current severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) pandemic has reduced healthcare care visits and treatment of patients with acute LBP (reduction by 87.2%) for several reasons [5, 6], back pain is still a growing medical and socio-economic problem [7]. It is estimated that more than a third of occupational diseases in the Nordic countries, the United States, and Japan are associated with the musculoskeletal system, and LBP has been identified as the leading cause of sick leave [8, 9]. LBP has a major impact on health workers [10], especially because it is one of the most common causes of work disability.
musculoskeletal diseases among them [11]. It is present in all groups of health professionals [10, 12–14] in primary, secondary and tertiary healthcare services [15]. The prevalence of LBP among healthcare workers varies and in studies it ranges from 53% [12] to 92% in those involved in rotating shift work [16]. Long-term work, associated with forced body movements and postures, especially in nurses and technicians, lifting weights, with shift work, can enhance the occurrence of LBP, and thus negatively affect the work process, but also the quality of life of health workers [16–21].

The aim of the study was to determine the presence of LBP and its impact on the quality of life among healthcare professionals.

Material and Methods

A prospective cross-sectional study was conducted in the period June 1 to 15, 2020. It included a total of 67 respondents of both genders, employed at the “Bač” Health Center (30 respondents) and the “Bački Petrovac” Health Center (37 respondents), Serbia. The research was voluntary and anonymous, with a signed informed consent and previously obtained consent of the Ethics Committees of both institutions. Socio-demographic data were obtained using a questionnaire specially constructed for the purpose of this research. Respondents also completed a Roland-Morris Disability Questionnaire (RMDQ) examining the impact of LBP on the quality of life [22–26]. The RMDQ is a questionnaire for assessing the degree of disability due to lumbar spine disease, and it has been applied, translated into a number of languages, in clinical practice for many years [22–25]. This questionnaire consists of 24 questions (items) where the theoretical minimum and maximum range from 0 to 24. A higher score indicates a higher degree of disability and interference with daily functioning of respondents due to back pain. The cut-off value indicating significant functional limitations measured by this questionnaire is 14 [22–26]. The questionnaire’s reliability was measured through internal consistency and it was necessary to calculate the Cronbach alpha coefficient. Acceptable values of the Cronbach alpha coefficient are those above 0.70. The Cronbach alpha coefficient per item ranges between 0.857 and 0.877, while the reliability of the entire instrument is 0.868. The questionnaire, designed for the needs of this research, contained the following variables: gender, age, years of work experience, level of formal education, presence of LBP, and length of its duration in weeks.

Data analysis, descriptive statistics such as frequencies, percentages, sample mean (arithmetic mean) and standard deviation were used. The probability level was set at p < 0.05. To test the differences between the parameters, Student’s t test and one-factor analysis of variance (ANOVA) were used. The relationship between the two values was tested by Pearson’s correlation coefficient. Statistical processing and analysis was done using the Statistical Package for the Social Sciences (SPSS) program for Windows, v. 24.

Table 1. Demographic characteristics of the sample

| Variables                        | Total/Ukupno (n = 67) |
|----------------------------------|------------------------|
| Gender/Male/Female               |                        |
| Male/Muški                       | 12 (17.9%)             |
| Female/Ženski                    | 55 (82.1%)             |
| Age (years)/Starost (godine), M ± SD (Min - Max) | 45.5 ± 12.2 (21–73) |
| Level of education/Stručna sprema, n (%) |                    |
| High school degree/Srednja stručna sprema | 38 (56.7%)            |
| Applied studies degree/Viša škola | 6 (9.0%)               |
| University degree/Visoka stručna sprema | 23 (34.3%)            |
| Work experience (years)/Dužina radnog iskustva (godine), M ± SD (Min - Max) | 20.62 ± 12.03 (1–41) |
| Current presence of back pain/Trenutno prisustvo bola u leđima, n (%) |                |
| Yes/Da                           | 35 (52.2%)             |
| No/Ne                            | 32 (47.8%)             |
| Duration of back pain during the last episode |                      |
| Dužina trajanja bola u leđima pri poslednjoj epizodi bola, n (%) | 42 (100%)          |
| Up to 6 weeks/Do 6 nedelja       | 19 (45.2%)             |
| 6 to 12 weeks/6 to 12 nedelja    | 1 (2.4%)               |
| More than 12 weeks/Više od 12 nedelja | 22 (52.5%)        |

Legend/Legenda: n - number of subjects/broj ispitanika; M ± SD (Min - Max) = mean ± standard deviation/(minimum - maximum)/aritmetička sredina ± standardna devijacija (minimum-maksimum)
Results

The research included 67 respondents, 12 (17.9%) men and 55 (82.1%) women. The age of the respondents ranged from 21 to 73 years, with an average of 45.5 ± 12.2 years. Respondents had an average of 20.62 ± 12.03 years of work experience. Thirty-eight (56.7%) respondents had a high school degree, 6 (9%) had a degree in applied studies, while 23 (34.3%) respondents had a university degree as the highest level of formal education. At the moment of examination, 35 (52.2%) subjects had a back pain. Subjects provided data on the duration of LBP during the last episode. Nineteen (45.2%) of them felt pain for up to 6 weeks, in one subject (2.4%) the pain lasted from 6 to 12 weeks, while 22 (52.5%) subjects felt pain for more than 12 weeks (Table 1).

There was no statistically significant difference between male and female subjects regarding the RMDQ score (3.83 ± 4.50 vs. 4.96 ± 4.53; p > 0.05). The RMDQ scores were similar in subjects with a high school degree (5.15 ± 4.62), applied studies degree (3.33 ± 4.36) and university degree (4.17 ± 4.32; p > 0.05). Those subjects who currently reported back pain had a higher RMDQ score (6.31 ± 4.24) compared to those who were pain free (3.12 ± 4.23; p < 0.01). However, those who reported having longer pain episodes, i.e. more than 12 weeks, also had a higher average RMDQ score (7.31 ± 4.46) compared to those who had pain for less than 6 weeks (4.68 ± 3.36; p < 0.05) (Table 2).

There was a statistically significant positive correlation between the age of the subjects and the RMDQ score (r = 0.407; p < 0.01). The correlation was positive and statistically significant at the level of 0.01, i.e. older respondents had higher RMDQ scores. The years of work experience also showed a statistically significant positive correlation with the RMDQ score (r = 0.371; p < 0.01). The strength of the connection was low, but statistically significant at the level of 0.01, i.e. the longer the work experience of the respondents, the higher the RMDQ scores (Table 3).

### Table 2. RMDQ score in the examined subjects

| Gender        | RMDQ score M±SD (Min-Max) | p value | p vrednost |
|---------------|---------------------------|---------|------------|
| Male/Muški    | 3.83 ± 4.50               | 0.437a  |
| Female/Ženski | 4.96 ± 4.53               |         |
| *RMDQ score   | 4.73 ± 4.49 (0 – 17)      |         |

| Level of education/Stručna sprema | RMDQ score M±SD (Min-Max) | p value | p vrednost |
|-----------------------------------|---------------------------|---------|------------|
| High school degree/Srednja stručna sprema | 5.15 ± 4.62 |         |
| Applied studies degree/Viša škola     | 3.33 ± 4.36 | 0.538b  |
| University degree/Visoka stručna sprema | 4.17 ± 4.32   |         |

| Current Presence of back pain/Trenutno prisustvo bola u leđima | RMDQ score M±SD (Min-Max) | p value | p vrednost |
|---------------------------------------------------------------|---------------------------|---------|------------|
| Yes/Da                                                        | 6.31 ± 4.24               | < 0.01a |
| No/Ne                                                         | 3.12 ± 4.23               |         |

| Duration of back pain*/Dužina trajanja bola u leđima* | RMDQ score M±SD (Min-Max) | p value | p vrednost |
|-------------------------------------------------------|---------------------------|---------|------------|
| Up to 6 weeks/Do 6 nedelja                            | 4.68 ± 3.36               | < 0.05a |
| More than 12 weeks/Više od 12 nedelja                 | 7.31 ± 4.46               |         |

**Legend/Legenda:** RMDQ - Roland-Morris Disability Questionnaire/RMDQ - Roland-Moriso upitnik onesposobljenosti; M ± SD (Min - Max) = mean ± standard deviation/minimum - maximum/aritmetička sredina ± standardna devijacija/minimum-maximum; p - statistical significance/statistička značajnost. *Category 6 to 12 weeks is omitted, because only one respondent belongs to this category/izostavljena je kategorija 6 do 12 nedelja, jer samo jedan ispitanik pripada ovoj kategoriji. *Student’s t-test/Studentov t-test; bANOVA test/ANOVA test

### Table 3. Relationship between the RMDQ score and the age of respondents and years of work experience

| Age (years)/Starost (godine) | Work experience (years)/Radno iskustvo (godine) | RMDQ score/RMDQ skor | p value | p vrednost |
|-----------------------------|--------------------------------------------------|----------------------|---------|------------|
| r                           | 0.407**                                         | 0.371**              |
| p                           | 0.001                                           | 0.003                |

**Legend/Legenda:** RMDQ - Roland-Morris Disability Questionnaire/RMDQ - Roland-Moriso upitnik onesposobljenosti; r - Pearson’s correlation coefficient/Pirsonov koeficijent korelacije; p - statistical significance/statistička značajnost, **Correlation is significant at the 0.01 level/2-tailed/korelacija značajna na nivou 0.01

There was no statistically significant difference between male and female subjects regarding the RMDQ score (3.83 ± 4.50 vs. 4.96 ± 4.53; p > 0.05). The average RMDQ score is 4.73 ± 4.49. The sample minimum and maximum ranged from 0 to 17.
Discussion

Healthcare workers are among the group with high risk of LBP [12]. Work in primary, secondary and tertiary healthcare institutions has its specificities for all profiles of healthcare workers, and it is often associated with musculoskeletal diseases [15]. Our investigation included 55 (82.1%) female participants, which is in line with other studies, where certain profiles of health workers, especially nurses, are dominated by women [12, 27]. The age of the sample in our study ranged from 21 to 73 years, with an average of 45.5 ± 12.2 years, which is significantly higher compared to other studies [11, 27]. Age, body mass index, and female gender were the most commonly reported individual risk factors for LBP [10]. In our study, respondents had an average of 20.62 ± 12.03 years of work experience. A number of studies indicate an association between years of work and LBP [13, 16]. A study including 120 health workers, by Zahra NAI et al, found that longer working hours may be associated with higher LBP prevalence [27]. The study including 87 respondents by Peković D, showed that mild pain dominates in the group of respondents with up to 10 years of work experience, examinees with 11 to 30 years of work experience mostly present with moderate pain, while severe/strong pain is dominant in the group of respondents with over 30 years of work experience. In the mentioned research, out of the total number of respondents who experienced lumbar pain, 63% reported that lifting loads was the main cause of pain, 17% reported bending over, and 7% stated that twisting the torso was the main cause of pain [16]. In our research, 38 (56.7%) respondents had a high school degree, 6 (9%) had applied studies degree, while 23 (34.3%) respondents had a university degree as the highest level of formal education. The level of education and qualifications are profiling the position and type of job in the health system. Zahra NAI et al, confirmed a highly significant relationship between LBP and age, sex, education, qualifications and years of experience [27]. In our study, we analyzed LBP in healthcare workers in primary healthcare. Several studies have found that health workers, especially those employed in secondary and tertiary healthcare facilities, are at increased risk for developing LBP [13, 15]. In the research by Peković D, 87% of respondents (nurses/technicians employed in a tertiary healthcare institution) stated that they had LBP in the last year [16]. Nurses and physical therapists were more susceptible to LBP [10], but it is also present among non-medical workers employed in the health sector [27]. In a study by Šimşek Ş. et al, including 1,682 healthcare workers, LBP was most common among medical secretaries (56.9%), and factors that increased the risk for LBP were advanced age, female gender, high body mass index, married status, lack of regular exercise, working for more than 4 hours while standing or sitting at the desk, using a computer for more than 4 hours, higher number of years of service, and low job satisfac-

Conclusion

The results of our study showed that the presence of low back pain is common in older health workers with longer work experience, regardless of the level of formal education. This study has some limitations, such as small number of respondents, lack of data on regular physical activity and exercise, or additional jobs, hobbies and activities out-
side the workplace, which may affect the development of low back pain. Additional education of health workers regarding protective attitudes, movements, and exercise, is needed in order to prevent the occurrence of low back pain in the work environment and improve the quality of life of health workers.

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