SUMMARY
Introduction/Objective The prevalence of depression in primary care is relatively high. The aim of the study was to assess the frequency of depression among patients in Zvezdara Primary Health Care Center in Belgrade. We also examined the relationship between depression and individual risk factors (socio-demographics, lifestyle characteristics, and health-related factors).

Methods A cross-sectional study, which included 422 adult patients, under 65 years of age, was conducted at the Zvezdara Primary Health Care Centre in Belgrade, Serbia, during January of 2018. The instrument used was Patient Health Questionnaire-9 (cut-off score ≥10). Multivariate logistic regression analysis was applied.

Results Depression, at least of moderate intensity, was found in 36% of the respondents. Around 1.4% of the participants confirmed suicidal thoughts almost every day during the previous two weeks. The logistic regression model showed the association with depression and being married (OR: 0.24, 95% CI: 0.13–0.44), single (OR: 0.43, 95% CI: 0.22–0.83), unemployment (OR: 3.83, 95% CI: 1.51–9.76), lifetime contact with mental health services (OR: 3.79, 95% CI: 2.19–6.57), and regular treatment for chronic illnesses (OR: 3.22, 95% CI: 1.94–5.34).

Conclusion This study found a relatively high prevalence of depression among patients in the primary health care center. We found an association between depression and marital status, employment, previous contact with mental health services, and regular treatment for chronic illnesses. The Patient Health Questionnaire-9 instrument could be implemented in primary health care settings in Serbia.

Keywords: depression; prevalence; primary health care

INTRODUCTION

Major depressive disorder (depression) is a common mental health condition in which the absence of positive affect is associated with mental health problems. The World Health Organization estimates that depression will be the second leading cause of the global burden of disease by 2020 [1]. Mood changes cover a spectrum from transitory “normal” low mood to clinically significant affective disorder (such as major depression), which may be life-threatening. Nevertheless, the higher the degree of affective disorder, the higher is the mortality rate and the prevalence of adverse outcomes [2].

There is evidence that almost half of patients with depression in Europe have been unrecognized or inadequately treated. This gap results from the reluctance of patients to seek help, as well as from misdiagnosis at the primary care level [3]. In health care systems, general practitioners are the first line contact with patients with mental health problems. It could be stated that timely diagnosis and the efficiency of treatment are affected by the general practitioners’ knowledge and training on the proper communication with this group of patients [4, 5]. The prevalence of depression varies among patients in primary health care and it ranges from 2.3% up to 48.5% [6–9]. The most recent meta-analysis from 2018 (n = 1,112,573 adults) showed no difference between the rural and urban settlements (13% vs. 17.7%, respectively) [10].

Different social factors could affect the development of depression, such as female sex, lower education, economic inactivity, and being divorced or widowed, or lifestyle characteristics and habits: diet, exercise, sleep [11–16]. If inadequately treated, depression can lead to many complications; in particular, it significantly increases the risk for suicide. Primary health care plays an important role in suicide prevention as more than one half of suicide victims contact their general practitioner one to four weeks prior to death, which creates the window of opportunity for the healthcare system to provide preventive measures [17, 18].

Screening instruments for depression are numerous and include Beck Depression InVENTORY, Zung Self-Rated Depression Scale, Kessler Psychological Distress Scale [19], Patient Health Questionnaire (PHQ-9), and its versions (PHQ-8 and PHQ-2), is widely proposed to be used in these settings, as it has been shown to have higher specificity and sensitivity compared to primary health care physicians’ diagnoses [3, 20]. Routine
use of the nine-item Patient Health Questionnaire (PHQ-9) may be useful at primary care level and it may identify individuals at risk for depression who would not otherwise have been identified [21]. Routine use of PHQ-9 is still not a frequent practice in Serbia. According to the education and practice in Serbia, general practitioners should be able to recognize the depression and refer the patient to the psychiatry treatment. The study among general practitioners in five Southeastern Europe countries showed that the majority of our general practitioners consider recognizing the depression as their responsibility [22].

Serbia National Health Survey conducted in 2013 (n = 19,079) found a 4.1% prevalence of depression (PHQ-8 total score 10–24) in the general population [23]. The prevalence of depression in primary health care centers in Serbia was examined by the Lisulov and Nedić [24], with PHQ-9 and MINI test.

The objective of the study was to assess the frequency of depression among patients at the Zvezdara Primary Health Care Center in Belgrade. We also examined the relationship between depression and individual risk factors (socio-demographics, lifestyle characteristics, and health-related factors).

METHODS

Patients and setting

A cross-sectional study was conducted at the Zvezdara Primary Health Care Center in Belgrade, Serbia. The study included patients aged 18–65 who visited three general practitioners in January 2018. The exclusion criteria were the following: age under 18 years, age over 65 years, pregnancy and postpartum, mental retardation or intellectual disability. Patients over 65 were excluded since it was shown that screening methods available are less robust for this age group and symptoms of depression often coexist with medical comorbidities [25, 26]. We excluded 14 patients who had an appointment with a psychiatrist before the study began and four who had not filled out the questionnaire. The final sample consisted of 422 patients. The required sample size (two-tailed) was calculated for a significance level of 5% and the power was set at 95%, whereas the proportion of depression was estimated to 25% by the Lisulov and Nedić [24] study. Our final sample of 422 exceeded the required minimum sample size of 72 patients. All the patients were informed on the study objective and the data collection. The patients gave their written consent to participate in the study.

The study was approved by the Ethics Committee of the Zvezdara Primary Health Care Center (No 1641/3) and the Faculty of Medicine, University of Belgrade (No 29/V1-15).

Data collection

The study instrument was a questionnaire, which consisted of four sections: socio-demographic and socio-economic characteristics, lifestyle characteristics, physical health, and mental health. Socio-demographic data were obtained by a questionnaire which included the following information: sex; age (for further analysis it was stratified into three clusters – 19–34 years, 35–54 years, and above 55 years), marital status (single, married, widowed, and divorced), educational level (elementary school, high school, college, and university), employment status (employed, unemployed, other – retired or student), monthly income per person in the household in Serbian dinars (RSD) – one euro is approximately 120 RSD (< 10,000 RSD, 10,000–25,000 RSD, 25,000–50,000 RSD, > 50,000 RSD), housing space per person (less than 10 m², 11–30 m², and above 31 m²), number of family members in the household (one, two, three to four, five or more members). The lifestyle characteristics were ‘Tobacco’ (yes/no) and ‘Alcohol’ (no/regularly/occasionally) consumption. The third part of the questionnaire included questions on health-related factors: whether they regularly took any prescribed medication at the time of this evaluation (yes/no) and whether they had contact with mental health services during their lifetime (yes/no).

Mental health was assessed by the PHQ-9 questionnaire, which has been widely used in primary care to quickly assess symptoms of depression and is considered a screening gold standard [18]. It has nine items scoring nine common symptoms of depression in the previous two weeks. It has a four-point rating scale from 0 – ‘not at all’ to 3 – ‘always’. Score 5–9 indicates mild depression, 10–14 moderate depression, 15–19 is considered moderate-severe depression, and 20 and above severe depression. The validated cut-off score of ≥ 10 (sensitivity of 0.85, specificity of 0.89) has been recommended as an indicator for moderate to severe depression symptoms [19]. The ninth question of PHQ-9 measures suicidality (questioning if there were any “thoughts that you would be better off dead or of hurting yourself in some way” could be scored “not at all,” “several days,” “more than half the days,” or “nearly every day”). The cut-off score of ≥ 1 was used as an indicator of suicidality (endorsement of “several days” or more to the item).

Data analysis

Descriptive statistics was used to show socio-demographic, socio-economic, and lifestyle characteristics, as well as health-related factors of the respondents (age, sex, education, employment status, marital status, number of family members in the household, monthly income per person, housing space per person, whether participant is taking any prescribed medication on a daily basis, and previous contact with mental health service). The difference in proportions was tested by the χ² test. Multivariate logistic regression analysis was performed to obtain significant factors (independent variables) associated with depression (dependent variable) and presented by odds ratio (OR), 95% confidence interval (CI), and p-value. All the data were analyzed using the IBM SPSS Statistics, Version 20.0 (IBM Corp., Armonk, NY, USA).
RESULTS

Based on PHQ-9 scores, the patients were divided into two groups: in the first one there were patients with the scores ≤ 9, who had none, minimal, or mild depression (n = 270; 64%), and in the second one there were patients with scores ≥ 10, who had moderate, moderately severe, or severe depression (n = 152; 36%). Cronbach alpha for PHQ-9 was 0.90 and ICC was ≥ 0.90.

About two-thirds (68%) of the patients were female. The majority of these were married (50.2%), 66.8% were employed, and the majority had a high school education (46.7%). The monthly income per person ranged 10,000–25,000 RSD (85–210 euros) for most of the patients. About 64% of the patients had no lifetime contact with mental health services. More than half were non-smokers (57.8%) and most of them reported no alcohol consumption (69.9%). About 59% of the patients were not using any medication on a daily basis (Table 1).

Table 1. Socio-demographic and other characteristics and percentages of positive screens for depression (PHQ-9 ≥ 10)

| Characteristics          | Total | PHQ-9 ≤ 9 | PHQ-9 ≥ 10 | P   |
|--------------------------|-------|-----------|------------|-----|
|                          | n     | %         | n          | %   |
| Total                    | 422   | 100       | 270        | 64  | 152 | 36 |
| Sex                      |       |           |            |     |     |    |
| Female                   | 287   | 68        | 188        | 65.5| 99  | 34.5| 0.342|
| Male                     | 135   | 32        | 82         | 60.7| 53  | 39.3|
| Age (years)              |       |           |            |     |     |    |
| 19–34                    | 122   | 29        | 82         | 67.2| 40  | 32.8| 0.061|
| 35–54                    | 219   | 52        | 145        | 66.2| 74  | 33.8|
| > 55                     | 80    | 19        | 42         | 52.5| 38  | 47.5|
| Marital status           |       |           |            |     |     |    |
| Married                  | 212   | 50.2      | 159        | 75  | 53  | 25  | < 0.001|
| Single                   | 125   | 29.6      | 76         | 60.8| 49  | 39.2|
| Widowed, divorced        | 85    | 20.1      | 35         | 41.2| 50  | 58.8|
| Education                |       |           |            |     |     |    |
| < High school            | 28    | 6.6       | 14         | 50  | 14  | 50  | 0.216|
| High school              | 197   | 46.7      | 124        | 62.9| 73  | 37.1|
| College                  | 74    | 17.5      | 46         | 62.2| 28  | 37.8|
| University               | 123   | 29.1      | 86         | 69.9| 37  | 30.1|
| Employment status        |       |           |            |     |     |    |
| Employed                 | 282   | 66.8      | 201        | 71.3| 81  | 28.7| < 0.001|
| Unemployed               | 77    | 18.2      | 33         | 42.9| 44  | 57.1|
| Other (student, retired) | 63    | 14.9      | 36         | 57.1| 27  | 42.9|
| Monthly income per person (RSD) |     |           |            |     |     |    |
| < 10,000                 | 47    | 11.2      | 27         | 57.4| 20  | 42.6| 0.092|
| 10,000–25,000            | 223   | 55.3      | 136        | 61  | 87  | 39  | 0.31|
| 25,000–50,000            | 117   | 28        | 86         | 73.5| 31  | 26.5|
| > 50,000                 | 31    | 7.4       | 19         | 61.3| 12  | 38.7|
| Housing space per person (m²) |     |           |            |     |     |    |
| 0–10                     | 26    | 6.2       | 15         | 57.7| 11  | 42.3| 0.701|
| 11–30                    | 304   | 72.9      | 195        | 64.1| 109 | 35.9|
| > 30                     | 87    | 20.9      | 58         | 66.7| 29  | 33.3|
| Number of family members in the household |     |           |            |     |     |    |
| 1                        | 37    | 8.8       | 19         | 51.4| 18  | 48.6| 0.420|
| 2                        | 72    | 17.1      | 47         | 65.3| 25  | 34.7|
| 3–4                      | 248   | 58.8      | 162        | 65.3| 86  | 34.7|
| 5 and more               | 65    | 15.4      | 42         | 64.6| 23  | 35.4|
| Any lifetime contact with mental health service |     |           |            |     |     |    |
| No                       | 270   | 64        | 239        | 72  | 93  | 28  | < 0.001|
| Yes                      | 152   | 36        | 31         | 34.4| 59  | 41.6|
| Smoking                  |       |           |            |     |     |    |
| No                       | 244   | 57.8      | 164        | 67.2| 80  | 32.8| 0.105|
| Yes                      | 178   | 42.2      | 106        | 59.6| 72  | 40.4|
| Alcohol consumption      |       |           |            |     |     |    |
| No                       | 295   | 69.9      | 195        | 66.1| 100 | 33.9| 0.167|
| Yes                      | 127   | 30.1      | 75         | 59.1| 52  | 40.9|
| Regular treatment for chronic illnesses |     |           |            |     |     |    |
| No                       | 249   | 59        | 185        | 74.3| 64  | 25.7| < 0.001|
| Yes                      | 173   | 41        | 85         | 49.1| 88  | 50.9|

RSD – the Serbian dinar currency;
p-value < 0.05 was considered statistically significant
The frequency of the patients who answered positively on the last question on the PHQ-9 (considering suicidality) was 10.8%. Around 1.4% of all the patients answered that they had suicidal thoughts or thoughts about hurting themselves almost every day.

The logistic regression model showed the association with depressive symptoms and being married (OR: 0.24, 95% CI: 0.13–0.44), single (OR: 0.43, 95% CI: 0.22–0.83), unemployment (OR: 3.83, 95% CI: 1.51–9.76), lifetime contact with mental health services (OR: 3.79, 95% CI: 2.19–6.57), and regular treatment for chronic illnesses (OR: 3.22, 95% CI: 1.94–5.34) (Table 2).

| Parameters                        | Positive screening for depression | p         | OR (95% CI)       |
|-----------------------------------|-----------------------------------|-----------|-------------------|
| Marital status                    |                                   |           |                   |
| married                           | < 0.001                           | 0.24 (0.13–0.44) |                   |
| single                            | 0.013                             | 0.43 (0.22–0.83) |                   |
| widowed, divorced                 | /                                 | Ref. category |                   |
| Employment status                 |                                   |           |                   |
| employed                          | 0.955                             | 1.02 (0.44–2.36) |                   |
| unemployed                        | 0.005                             | 3.83 (1.51–9.76) |                   |
| other (student, retired)          | Ref. category                     |           |                   |
| Any lifetime contact with mental health service | < 0.001 | 3.79 (2.19–6.57) |                   |
| Regular treatment for chronic illnesses | < 0.001 | 3.22 (1.94–5.34) |                   |

OR – odds ratio, CI – confidence interval, p-value < 0.05 was considered statistically significant

**DISCUSSION**

This cross-sectional study of depression prevalence in an urban population of Serbia indicated that more than one-third of adults attending the Primary Health Care Center had depressive symptoms of moderate, moderately severe, or severe intensity. Another study of the primary health care center population in Vojvodina, by Lisulov and Nedić [24], registered a prevalence of 24.5%. Studies in primary health care in the world reported prevalence in a wide range, 2.3–48.5% [6, 7, 9]. Overall, the prevalence in the primary health care center population is much higher than prevalence of depression reported in the general population. For example, prevalence reported by the National Health Survey conducted in the general population of Serbia in 2013 was only 4.1% [23].

In our study, 1.4% of participants answered that they had suicidal thoughts almost every day during the previous two weeks. In the literature, the prevalence of suicidal thoughts was estimated at around 10%, which meant that suicidal thoughts were present “more than half the days” or “nearly every day” in 1/10 adults who were visiting their general practitioner [27]. By showing that cumulative probability of both nonfatal and fatal suicidal attempts (according to response to item 9 of the PHQ-9) was ranging from approximately 0.4% (1/250) for those responding “not at all”, to approximately 4% (1/25) for those responding “nearly every day,” Simon et al. [27] emphasized the need for sustained and organized follow-up care to address an ongoing risk of suicide. We fully support this statement, in particular related to primary health care center screening practices [27].

Several individual-level factors: lower education, female sex, economic inactivity and being divorced or widowed, were associated with increased odds of depression in a large, multilevel cross-national study of prevalence of depression, which was conducted in 68 countries [4]. It was shown previously that women are twice more likely to experience depression during their lifetime in most studies [7, 15]. The results of the National Health Survey of the Republic of Serbia 2013 demonstrated that symptoms of depression were present in a significantly higher percentage in women (5.3%) than in men (2.9%) [23]. In our study, sex was not associated with the likelihood of depression. This could be explained by numerous social factors in Serbia, which could have led to an increase in prevalence of mental health problems. Previous studies have shown that women are more likely to be depressed in countries in which they have lower income, and lower socio-economic status. Women are more likely to be prescribed with more antidepressants than men are, which may be associated with higher prevalence reported [22].

Our study showed that married patients are less likely to have depression compared to single/widowed/divorced patients, which is in agreement with previous studies [28]. Kessler et al. found that being separated/divorced was associated with an increased risk of depressive disorders in 12 countries (OR from < 4 to > 8) [13]. Married participants have strong social support from their partners, which can serve as a protective factor for depression [16].

Unemployed participants had almost four times higher likelihood for developing depression disorders. The reason could be that increase in household spending could stress unemployed participants more and create suitable environment for depression [29]. In our study, the likelihood for developing depression in unemployed patients was three-fold higher than that for the employed.

Another independent factor associated with depression in our study was previous contact with a mental health service (almost four times higher likelihood). Having in mind that our participants were attending their general practitioners for general medical care and that those who already had an appointment with a psychiatrist were excluded, the correlation of actual depression and any lifetime contact with mental health services is to be considered further. The implications of these findings are many, but still beyond the scope of this paper.

In our study, regular treatment for chronic illnesses was also associated with higher likelihood (more than three times higher likelihood). Previous research confirmed that chronic diseases were predictors for depression. However, recent studies have demonstrated the inverse causality, i.e. depression precedes chronic illness [28]. Comorbidities associated with depressive disorders are highly prevalent in primary health care practice and a causal link between comorbid physical disorder and depression is yet to be studied [30].

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LIMITATIONS

Our study revealed a relatively high proportion of depression in adults visiting their general practitioner in the primary health care center. These results should be treated with some caution. PHQ-9 scores do rate some of the patients as depressive despite the fact that psychiatric clinical examination may often reject this diagnosis (false positive findings). In the opposite direction, our question regarding alcohol habits was answered with ‘no’ in 70.2% of the cases. There is a slight chance that it was a false negative finding, because the latest reports of alcohol consumption in Serbian population aged 15 years and more, both sexes, showed higher prevalence of alcohol consumption in the population (48.4%) in comparison to our findings. Aforementioned limitations are usual in the evaluations based on self-report instruments and the truth is that only physician-administered interview tools with clinical accuracy will lead to a sufficient diagnostic evaluation for those at risk. Nevertheless, on a day-to-day basis, the use of the self-report PHQ-9, with evaluation of both alcohol/ drug consumption and anxiety by screening questions, remains the briefest, simplest, most accurate way to diagnose depressive and other frequent psychopathological symptoms in the adult population. Patients can complete and score the questionnaires themselves in the waiting room prior to seeing their doctor. Consistent use of this approach in primary health care centers could improve our national general medical practices, helping to choose the most appropriate interventions and to monitor the outcomes.

CONCLUSION

Depression is highly prevalent in many settings. Early screening for depression in primary health care using the PHQ-9 instrument is essential for early recognition and management of the disorder. Depression and depressive disorders are often associated with numerous socio-demographic factors. In our study, we found the association between depression and marital status, employment, previous contact with mental health services, and regular treatment for chronic illnesses. We found relatively high prevalence of depression in our sample, which supports the need for training of primary health center doctors to implement screening instruments for depression.

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Учесталост и корелати депресије на примарном нивоу здравствене заштите у Београду
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САЖЕТАК
Увод/Циљ Учесталост депресије међу испитаницима на нивоу примарне здравствене заштите је релативно висока. Циљ ове студије био је да се испита учесталост депресије међу болесницима који су посетили свог изабраног лекара у Дому здравља „Звездара“ у Београду, као и да се испита повезаност депресије са индивидуалним факторима ризика (социјално-демографским, карактеристикама животног стила и факторима повезаним са здрављем).

Метод Студија пресека, која је обухватала 422 одрасла учесника млађа од 65 година, спроведена је у Дому здравља „Звездара“ у Београду, Србија, током јануара 2018. године. Инструмент истраживања био је Упитник о здрављу пацијената (Patient Health Questionnaire 9, PHQ-9). Гранчична вредност је износила ≥10. Примене је мултиваријантна логистичка регресија анализи.

Резултати Корд 36% особа утврђена је депресивност (умерени, умерено тешки или тешки степен изражености), док је 1,4% свих испитаника имало суицидне мисли скоро сваког дан током последње две недеље. Мултиваријантна логистичка регресија је показала повезаност депресивности и брачног стања – у браку (OR: 0,24; 95% CI: 0,13–0,44), незапослености (OR: 3,83; 95% CI: 1,51–9,76), претходних контаката са службама за ментално здравље (OR: 3,79; 95% CI: 2,19–6,57) и регуларне терапије хроничних болести (OR: 3,22; 95% CI: 1,94–5,34).

Закључак Ова студија је показала релативно високу учесталост депресивности у испитаницима у дому здравља. Пронашли смо повезаност између депресије и брачног стања, запослености, претходних контаката са службама менталног здравља и регуларне терапије хроничних болести. Инструмент PHQ-9 може се применити у примарној здравственој заштити у Србији.

Кључне речи: депресија; учесталост; примарна здравствена заштита