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FACTORS INFLUENCING GENERAL PRACTITIONER CHOICE AMONG WORKING-AGE POPULATION IN SERBIA

Abstract: This study investigates how sick leave and socio-demographic and occupational factors affect the choice of general practitioners in Serbia. The objective was to identify the factors influencing the choice of a general practitioner among employees in Serbia, considering incidences of sick leave. The study analyzed data from the 2019 Serbian National Health Survey, including 4,652 participants aged 18 to 65 years, using descriptive statistics and binary logistic regression. Overall, 92.4% of participants, mostly employees in the public sector (85.2%), chose a general practitioner, with a higher prevalence among episodes of prolonged sick leave (92.8%). The choice of a general practitioner is influenced by socio-demographic and health-related factors. Being employed by an employer leads to a more frequent choice of a general practitioner (OR = 2.277). Blue-collar workers (OR = 0.757) and employees of middle and poor wealth status are less likely to choose a general practitioner among participants without sick leave (middle OR = 0.709, poor OR = 0.701). Employees in Vojvodina with sick leave are significantly less likely to choose a general practitioner compared to Belgrade (OR = 0.111). The last visit to a general practitioner is a significant predictor for both groups. Socio-demographic, work-related factors, and health status significantly influence the choice of general practitioner among employees in Serbia, indicating the importance of accessible primary healthcare during periods of sick leave.

Keywords: General practitioners, sick leave, healthcare disparities, access to primary healthcare, Serbia

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Introduction

The 2018 Astana Declaration emphasizes Primary Health Care (PHC) as the foundation for universal health coverage (1, 2). In Serbia, overseen by the Ministry of Health and the National Health Insurance Fund, healthcare is funded through mandatory contributions and covers 98% of the population (3, 4). Since 2005, Serbian citizens have been able to choose general practitioners (GPs) in PHC, while capitation was introduced in 2013 with the aim of rewarding quality and efficiency (3, 4). During 2019, 3,493 chosen GPs were available across 158 health centers. There is a pronounced choice of GPs in the public health sector compared to private practice (69.4% versus 5.6%) (3, 5, 6). Private practice, which operates independently, requires direct payment or private insurance, with limited access to patient services. Citizens receive health insurance based on employment, and occupational health in PHC provides mandatory pre-employment and periodic examinations of employees (4).

Sick leave, as a key health indicator for the working-age population, is a subject of interest for various professionals, including healthcare workers and economists (7). Influenced by demographic, socio-economic factors, and working conditions (8), sick leave represents a complex issue with consequences for employee well-being and economic costs (9–11). Sick leave has significant consequences for individuals, employers, and the healthcare system (12). The costs of sick leave are significant and include lost productivity and healthcare costs. The frequency and duration of sick leave vary, which further complicates the issue, with different factors in episodes of short-term and long-term sick leave (13).

Research indicates that sick leave is influenced by working conditions, demographic factors, health status, health-related behavior, and healthcare utilization (13, 14). GPs play a key role in managing sick leave, return to work, and assessment of permanent work incapacity, with a confirmed link between PHC and worker well-being. In Serbia, GPs are authorized to issue sick leave certificates for up to 30 days (short-term sick leave), after which they refer the patient to the First-Level Medical Commission of the National Health Insurance Fund (3, 4).

Countries, including Serbia, strive for universal health coverage (15, 16). The choice of GP affects patient satisfaction, visit frequency, and quality of healthcare, thereby increasing service efficiency and physician competitiveness (16, 17). To achieve these goals, it is necessary to take into account disease prevalence and public attitudes, with a focus on the patient (18, 19). Accessibility, expertise, and positive experiences are key factors in choosing a GP (15, 16). Physician qualifications, thoroughness of examination, and individual patient experiences further shape preferences in GP choice (17, 20).

There is a lack of research on factors influencing GP choice among employees, especially during episodes of sick leave in Serbia. This study aims to investigate how sociodemographic characteristics, work-related factors, and health status influence GP choice in the context of sick leave.

Material and methods

In this study, data from the 2019 Serbian National Health Survey were analyzed. The survey was conducted from October to December 2019 and included 13,178 individuals aged 15 and above, while our study focused on the working-age population aged 18 to 65 years, resulting in a sample of 4,652 participants. We used European Health Interview Survey (EHIS 3) questionnaires, based on internationally accepted and defined criteria, adapted to the Serbian context. A household questionnaire, face-to-face interview, and self-administered questionnaire were employed.

The dependent variable related to the choice of general practitioner, with responses categorized as "no" (coded as 0) and "yes" (coded as 1). Additionally, participants were asked whether their chosen general practitioner worked in the public, private sector, or both.

Guided by Anderson's behavioral model, the study considered predisposing, enabling, and need factors. Predisposing factors included gender (male or female), age (years), marital status (married, single, and divorced/widowed), educational level (college and university, high school, primary school, and lower), employment status (self-employed, employed by an employer), and occupation (white-collar, blue-collar). Enabling factors included wealth index (rich, middle, and poor) and geographic regions. Need factors included the last visit to a general practitioner (> 12 months ago, ≤ 12 months ago), self-perceived health (good, fair, poor), activity limitations (no, yes), and presence of chronic diseases (0, 1, ≥2).

Categorical data were presented as frequency and percentage. Variable correlations were tested using the chi-square test ($p < 0.05$). Binary logistic regression assessed predictors, with presentation of odds ratios (OR) and 95% confidence intervals (95% CI). All analyses were conducted in IBM SPSS Statistics, version 20.0 (IBM Corp., Armonk, NY).

Before data collection, informed consent was obtained from study participants, permission to use secondary data was obtained from the Institute of Public Health of Serbia "Dr Milan Jovanović Batut", and the database was transferred to the University of Kragujevac, Faculty of Medical Sciences, for further research.

Results

The study included 4,652 participants, of whom 55.9% were men and 44.1% were women, with a response rate of 97.6%. The mean age of men was 42.55 ± 11.5 years, and women 42.84 ± 10.7 years. Other participant characteristics are shown in Table 1.

Table 1. Participant characteristics

Variables		N	%
Gender	Male	2599	55.9
	Female	2053	44.1
Age	18–25	315	6.8
	26–35	1034	22.2
	36–45	1354	29.1
	46–55	1224	26.3
	56–65	725	15.6
Marital status	Married	3189	70.5
	Single	975	21.5
	Divorced/widowed	368	8.0
Educational level	College/University	1352	29.1
	Middle school	2960	63.7
	Primary school	338	7.3
Employment	Self-employed	630	13.9
	By employer	3901	86.1
Occupation	White collars	2733	59.3
	Blue collars	1874	40.7
Wealth index (class)	Rich	2537	54.5
	Middle	958	20.6
	Poor	1157	24.9
District	Belgrade (Capital)	1234	26.5
	Northern Serbia	1133	24.4
	Central and Western Serbia	1458	31.3
	Southern and Eastern Serbia	827	17.8
Last visit to a general practitioner	> 12 months	1866	40.5
	≤ 12 months	2738	59.5
Sick leave	No	3915	85.2
	≤ 30 days	554	12.1
	> 30 days	125	2.7

General health	Good	3650	84.5
	Fair	650	14.7
	Bad	119	2.7
Chronic morbidity	No	3265	70.2
	Yes	1384	29.8
Long-standing activity limitations	No	3265	70.2
	Yes	1384	29.8
Chronic illness	0	3025	65.1
	1	943	20.3
	≥ 2	679	14.6

Continuity Correction[b]

Table 2 shows the length of sick leave in relation to the choice of general practitioner. In total, 4,194 participants, 91.1% of men and 94.0% of women, chose a general practitioner. In the public health sector, 85.2% chose a general practitioner, and 92.8% had prolonged sick leave. In the private sector, 2.1% chose a general practitioner, with 0.8% of participants with prolonged sick leave. Those who chose a general practitioner in both sectors (5.1% in total) had 6.4% prolonged sick leave. A significant association ($p < 0.05$) was observed between GP choice and sick leave.

Table 2. Prevalence of sick leave in relation to chosen general practitioner

Chosen general practitioner	Total		Sick leave						
	N	%	No		≤ 30 days		> 30 days		Pearson Chi--Square/df/p
			N	%	N	%	N	%	
No	343	7.6	322	8.5	21	3.8	0	0.0	30.423/6/0.000
Public sector	3819	85.2	3218	84.5	485	87.9	116	92.8	
Private sector	93	2.1	83	2.2	9	1.6	1	0.8	
Both sectors	229	5.1	184	4.8	37	6.7	8	6.4	

There is a statistically significant difference ($p < 0.05$) between GP choice and factors such as gender, age, marital status, education, employment status, wealth status, region, last visit to a general practitioner, presence of chronic diseases, self-perceived health, and long-term activity limitations.

In univariate regression among employees without sick leave, women were more likely to choose a GP compared to men (OR = 1.496). The age group 56-65 years was more likely to choose a GP compared to the 18-25 age group (OR = 1.770). Sin-

gles were less likely to choose a GP, and those with high school or lower education were also significantly less likely to choose a GP. Employment by an employer (OR = 2.238) led to more frequent choice of a GP, while blue-collar workers were less likely to choose a GP (OR = 0.605). Middle and poor wealth status categories were less likely to choose a GP compared to the rich class. All regions, except the capital city (Belgrade), showed less inclination toward choosing a GP. A visit to a GP in the last year significantly increased the likelihood of choosing a GP (OR = 4.053). Fair self-perceived health, long-term limitations, and having one chronic disease also led to more frequent choice of a GP. In univariate regression for participants with sick leave, two factors stood out. Participants in Vojvodina were less likely to choose a GP compared to Belgrade (OR = 0.193). Time since the last visit to a GP was the most significant predictor for choosing a GP (OR = 4.243) (Table 3).

Table 3. GP choice in relation to socio-demographic and work factors among participants without and with sick leave

		Without sick leave		With sick leave	
		Univariate	Multivariate	Univariate	Multivariate
		OR (95%CI)	OR (95%CI)	OR (95%CI)	OR (95%CI)
Predisposing factors					
Gender	Male	1	1	1	1
	Female	1.496 (1.179-1.899)**	1.186 (0.901-1.559)	1.452 (0.604-3.493)	1.332 (0.456-3.891)
Age	18-25	1	1	1	1
	26-35	0.778 (0.491-1.234)	0.662 (0.393-1.114)	1.516 (0.296-7.761)	3.096 (0.432-22.207)
	36-45	1.143 (0.719-1.818)	0.971 (0.559-1.688)	4.196 (0.728-24.182)	6.811 (0.743-62.434)
	46-55	1.210 (0.754-1.940)	0.972 (0.542-1.742)	2.841 (0.541-14.903)	2.822 (0.323-24.655)
	56-65	1.770 (1.027-3.050)*	1.265 (0.654-2.450)	5.304 (0.711-39.587)	5.251 (0.415-66.528)
Marital status	Married	1	1	1	1
	Single	0.668 (0.516-0.864)*	0.852 (0.610-1.190)	0.549 (0.192-1.574)	1.411 (0.371-5.362)
	Divorced/widowed	0.724 (0.481-1.091)	0.732 (0.457-1.172)	0.628 (0.175-2.259)	0.654 (0.152-2.824)
Educational level	College/University	1	1	1	1
	Middle school	0.641 (0.485-0.847)*	0.884 (0.636-1.228)	1.321 (0.512-3.411)	1.635 (0.538-4.970)
	Primary school	0.474 (0.303-0.741)**	0.869 (0.500-1.509)	1.257 (0.255-6.206)	2.154 (0.327-14.183)

Employment	Self-employed	1	1	1	1
	By employer	2.238 (1.718-2.915)**	2.277 (1.695-3.060)**	1.933 (0.55-6.777)	2.655 (0.605-11.645)
Occupation	White collars	1	1	1	1
	Blue collars	0.605 (0.482-0.761)**	0.757 (0.581 -0.987)*	1.164 (0.476-2.848)	1.433 (0.488-4.212)
Enabling factors					
Wealth index	Rich class	1	1	1	1
	Middle class	0.583 (0.436-0.780)**	0.709 (0.512-0.982)*	1.457 (0.401-5.296)	1.645 (0.399-6.775)
	Poor class	0.511 (0.392-0.665)**	0.701 (0.512-0.960)*	0.590 (0.224-1.553)	0.476 (0.1563-1.481)
District	Capital (Belgrade)	1	1	1	1
	Northern Serbia	0.500 (0.335-0.747)**	0.545 (0.348-0.854)*	0.193 (0.054-0.696)*	0.111 (0.027-0.456)*
	Central and Western Serbia	0.321 (0.223-0.464)**	0.344 (0.229-0.515)**	0.772 (0.171-3.494)	0.670 (0.132-3.401)
	Southern and Eastern Serbia	0.329 (0.222-0.489)**	0.270 (0.172-0.425)**	0.668 (0.110-4.069)	0.482 (0.066-3.542)
Need factors					
Last visit to a general practitioner	>12 months	1	1	1	1
	≤12 months	4.053 (3.133-5.243)**	3.990 (2.999-5.307)**	4.243 (1.655-10.877)*	5.061 (1.649-15.533)*
Self-rated health	Very good/good	1	1	1	1
	Fair	4.053 (3.133-5.243)*	1.049 (0.643-1.713)	1.764 (0.582-5.349)	1.150 (0.302-4.373
	Bad/very bad	1.029 (0.408-2.592)	0.517 (0.182-1.467)	2.198 (0.286-16.887)	0.744 (0.055-10.110)
Long-standing limitations	No	1	1	1	1
	Yes	1.650 (1.011-2.691)	1.234 (0.679-2.242)	3.349 (0.772-14.530)	3.502 (0.550-22.309)
Chronic illness	No	1	1	1	1
	1	1.467 (1.069-2.014)*	1.367 (0.974-1.918)	1.884 (0.534-6.648)	1.671 (0.421-6.635)
	2 or more	1.231 (0.871-1.739)	1.061 (0.733-1.536)	1.136 (0.367-3.515)	0.950 (0.260-3.470)

Statistically significant ($p<0.05$); OR – odds ratio; 95%CI – 95% confidence interval; * $p<0.05$; ** $p<0.01$

In the multivariate regression model, differences were shown between participants with and without sick leave regarding GP choice. Employment by an employer led

to a more frequent choice of a GP (OR = 2.277). Blue-collar workers (OR = 0.757) were less likely to choose a GP compared to white-collar workers, and individuals of middle and poor wealth status were less likely to choose a GP compared to the rich. By region, employees with sick leave in Vojvodina were significantly less likely to choose a GP compared to Belgrade. Time since the last visit to a GP was the most significant factor influencing GP choice for both groups of participants. Participants without sick leave were significantly more likely to choose a GP (OR = 3.990), and employees with sick leave showed an even greater likelihood of choosing a GP (OR = 5.061).

Discussion

Our research, based on Anderson's behavioral model, highlights key factors influencing GP choice among employees in Serbia. A significant 92.4% chose a GP, which is between 96% in Sweden (21) and 43.10% in China (2). Among predisposing factors, women and individuals aged 56–65 years had a higher likelihood of choosing a GP, which is consistent with findings from France (22), China, and the United Kingdom (23, 24). Marital status and education also influenced GP choice, with singles and individuals with lower education having a lower likelihood of choosing a GP. Higher education, younger age, and higher income are associated with more active GP choice, similar to findings by Victoor et al. (25) and research in China (23), indicating that higher education is associated with more frequent use of primary healthcare services. Employment status, particularly employment by an employer, increases the likelihood of choosing a GP, while blue-collar workers are less likely to do so, corresponding to results of studies conducted in Finland (26, 27).

Socioeconomic status and region significantly influence GP choice, which is consistent with Anderson's model and existing studies (3, 28). Lower socioeconomic status is associated with less frequent visits to a GP, while Belgrade residents more often choose a GP. Individuals with sick leave in Vojvodina have a lower likelihood of choosing a GP. In southern and eastern Serbia, 11.8% do not have a chosen GP despite universal healthcare, indicating regional inequalities (6). Distance remains a key factor in GP choice, which is confirmed by previous research (23).

Need factors, according to Anderson's model, such as a recent visit to a GP, self-perceived health as fair, and chronic conditions, influence GP choice. Individuals with poor self-perceived health have a higher likelihood of choosing a GP, which is consistent with studies from France (22), Serbia (29, 30), China, and Iran (23, 31). Chronic diseases significantly increase visits to a GP, especially in the private sector in Serbia.

The results indicate a strong association between GP choice and prolonged sick leave in the public health sector, where 92.4% choose a GP. Contrary to certain

shifts toward private sector providers seen elsewhere (31), our data do not confirm this trend in Serbia (32). Individuals who choose GPs in both sectors (5.1%) have episodes of prolonged sick leave in 6.4% of cases. Since the private sector operates on a fee-for-service basis and cannot issue sick leave certificates, only the GP from the public health sector is authorized to issue sick leave certificates to patients with sick leave (3). Among those who chose a GP in the private sector (2.1%), only 0.8% report prolonged sick leave. This context significantly shapes GP choice, affects healthcare accessibility, and patient preferences. Such a complex healthcare system requires a better understanding of the impact on sick leave and patient care. These results can guide policymakers and healthcare providers in shaping targeted interventions that will meet employees' preferences toward different sectors.

The obtained findings provide important insight into GP choice among the working-age population in Serbia, creating a foundation for future research and targeted interventions. Addressing socioeconomic inequalities requires interventions that bridge differences in healthcare access based on education and wealth status. Regional strategies are needed to combat regional inequalities and ensure equal accessibility to primary healthcare. Adapted occupational health programs can mitigate work-related factors and encourage the use of general practice. For employees with lower education and in economically disadvantaged positions, it is crucial to encourage regular visits to chosen GPs.

This study complements existing knowledge by examining the relationship between demographic, socioeconomic, and health factors and GP choice, which is an area that is insufficiently researched in the available literature. As the first national study in Serbia in this area, the stratified sample provides a reliable and representative dataset, thereby increasing the reliability and applicability of our findings.

Several limitations should be kept in mind when interpreting the results. GP choice was assessed by a single question, which provides a simplified picture. Lack of data on visit frequency and causes of sick leave limits understanding of GP choice. We did not explore healthcare gatekeeping practices, physician reputation, professional aspects, or cultural beliefs. Data based on self-reporting may lead to bias. Future research should include longitudinal and qualitative studies for a better understanding of GP choice factors.

Conclusion

The presented results emphasize the role of demographic, socioeconomic, and health status factors in GP choice among the working-age population in Serbia. Women, older employees, and individuals with higher education more frequently choose a GP. Also, higher socioeconomic status and living in the capital city are associated with GP choice. Prolonged sick leave is significantly associated with GP choice. The

results emphasize the need for targeted interventions to improve primary healthcare accessibility, reduce inequalities, and provide information on the importance of GP choice among employees in Serbia.

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