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**Factor structure of job satisfaction among healthcare professionals in
public hospitals in Belgrade, Serbia**

Структура фактора задовољства послом међу здравственим радницима у
државним болницама у Београду, Србија

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Factor structure of job satisfaction among healthcare professionals in public hospitals in Belgrade, Serbia

Структура фактора задовољства послом међу здравственим радницима у државним болницама у Београду, Србија

SUMMARY

Introduction/Objective This study aimed to examine job satisfaction among healthcare professionals in public hospitals in Belgrade, Serbia, and to identify its underlying dimensions using exploratory factor analysis.

Methods A cross-sectional study was conducted using a standardized job satisfaction questionnaire developed according to the methodology of the Institute of Public Health of Serbia. The analysis included 6899 healthcare professionals, categorized into two groups according to educational level: those with a university degree and those with secondary school or college education. Descriptive statistics, Student's *t*-test, χ^2 test, and exploratory factor analysis were applied.

Results Healthcare professionals with a university degree reported significantly higher satisfaction than those with secondary school or college education across the analyzed domains. The highest satisfaction scores were observed for collaboration with colleagues and superiors, whereas salary was the lowest-rated item in both groups. Exploratory factor analysis identified three dimensions of job satisfaction: "Organizational Culture and Personal Development", "Working Conditions," and "Workplace Change Intention."

Conclusion Job satisfaction among healthcare professionals in Belgrade public hospitals was multidimensional and differed according to educational background. The findings indicate that interpersonal collaboration was among the most positively evaluated aspects of work, whereas salary and other working conditions represented important sources of dissatisfaction. The identified factor structure provides exploratory evidence for further research and more detailed organizational assessment of job satisfaction in healthcare settings.

Keywords: professional satisfaction; professional development; professional communication

САЖЕТАК

Увод/Циљ Студија је имала за циљ да испита задовољство послом међу здравственим професионалцима у државним болницама у Београду, у Србији, и да идентификује основне димензије задовољства коришћењем експлоративне факторске анализе.

Метод Спроведена је студија пресека коришћењем стандардизованог упитника Института за јавно здравље Србије. Узорак је обухватио 6899 здравствених професионалаца из државних болница у Београду, категорисаних у две групе на основу нивоа образовања, и то: са универзитетским образовањем, и оних са средњом и високом струковном школом. Примењене су дескриптивне статистичке анализе, Студентов *t*-тест, тест χ^2 , као и експлоративна факторска анализа.

Резултати Уочене су значајне разлике у задовољству послом између две групе, при чему су здравствени професионалци са универзитетским образовањем задовољнији у свим анализираним доменима. Испитаници су били најзадовољнији међуљудским односима, сарадњом са колегама и претпостављенима док су плата и услови рада били главни разлози незадовољства у обе групе. Експлоративна факторска анализа је идентификовала три димензије задовољства послом: (1) организациону културу и лични развој, (2) услове рада и (3) намеру за промену посла.

Закључак Задовољство послом међу здравственим професионалцима у државним болницама у Београду било је вишедимензионално и разликовало се у зависности од нивоа образовања. Резултати показују да је сарадња са колегама и претпостављенима, као и међуљудски односи су били најпозитивније оцењени аспекти задовољства послом, док су плата и други услови рада представљали важне изворе незадовољства. Идентификована факторска структура пружа истраживачке доказе за даља истраживања и детаљнију организациону процену задовољства послом у здравственим установама.

Кључне речи: професионална сатисфакција; професионални развој; професионална комуникација

INTRODUCTION

Over the past three decades, research has consistently shown that employees represent one of the most important resources in any organization, and that their job satisfaction directly affects performance, motivation, and commitment to meeting organizational expectations. Motivated and satisfied employees

contribute to continuous quality improvement, make better use of their knowledge and skills, share expertise with colleagues, and actively participate in improving the quality of their work [1–4].

In healthcare institutions, health professionals play a particularly important role, as they are a key determinant of patients' perceptions of the quality of care received and of the extent to which services meet their expectations [5].

Previous studies have shown that job satisfaction and motivation among health professionals are influenced by a wide range of individual (gender, age, marital status, occupation, level of education, years of work experience, managerial position), organizational (autonomy at work, opportunities for career advancement, interpersonal relationships), and external factors (economic conditions, broader social circumstances, and family obligations). Healthcare managers should recognize and understand these factors in order to manage human resources effectively [6–10].

Several recent studies have examined the dimensionality of job satisfaction instruments using exploratory factor analysis in the context of healthcare professionals' job satisfaction [10–12]. Munir and Rahman found that job satisfaction consisted of four factors: salary, co-worker support, managerial support, and career development [11]. Another study identified six factors: benefits and salary, management attitude, supervision, communication, nature of work, and colleagues' support [12]. These findings suggest that financial compensation may represent an independent dimension of job satisfaction among healthcare professionals. In contrast, Lorber and Skela Savič reported that salary was not an independent factor, but rather a component of a broader motivational factor [10]. These inconsistent findings indicate that the structure of job satisfaction may vary across healthcare systems, professional groups, and organizational contexts.

Physicians have a particularly important role in healthcare management because they directly influence patient care, clinical decision-making, and team dynamics. [13]. Given the increasing complexity of healthcare environments and changing workforce expectations, it is important to understand differences in job satisfaction across professional roles, leadership responsibilities, and educational backgrounds.

Therefore, the aim of this study was to examine the multidimensional structure of job satisfaction among healthcare professionals in public hospitals in Belgrade, Serbia, using exploratory factor analysis and to analyze differences in job satisfaction according to professional role and educational level.

METHODS

This study was based on a secondary analysis of data obtained from a job satisfaction survey conducted according to the methodology of the Institute of Public Health of Serbia [14]. A cross-sectional study design was used, and employee satisfaction was assessed at a single point in time, on the same survey day. Data entry from the completed survey forms was performed at the Institute of Public Health in Belgrade [15]. For the purposes of the present study, only questionnaires completed and returned by healthcare professionals were included in the analysis.

Healthcare professionals were divided into two groups according to their educational level. The first group consisted of healthcare professionals with university education, including doctors, dentists, and pharmacists, hereinafter referred to as HPUD. The second group consisted of healthcare professionals with secondary school or college education, including nurses and healthcare technicians, hereinafter referred to as HPSEC.

The questionnaire consisted of 24 closed-ended questions covering the general characteristics of healthcare professionals, including gender, age group, occupation, managerial position, participation in teaching, and engagement in private practice. The questionnaire also assessed working conditions, opportunities for professional development, relationships with superiors, collaboration with colleagues, perceived patient attitudes toward employees, overall job satisfaction, and intention to change jobs.

Respondents rated their satisfaction on a five-point Likert scale, where 1 indicated “very dissatisfied”, 2 “dissatisfied”, 3 “neither satisfied nor dissatisfied”, 4 “satisfied”, and 5 “very satisfied”. In the analysis, responses rated 4 or 5 were considered to indicate satisfaction with the investigated variable, whereas responses rated 1 or 2 were considered to indicate dissatisfaction. Responses rated 3 were treated as neutral, indicating neither satisfaction nor dissatisfaction.

Descriptive statistics were used to describe the study population. Differences between groups were analyzed using Student’s t-test for continuous variables and the chi-square test for categorical variables. Exploratory factor analysis was performed to identify the underlying dimensions of job satisfaction. Items with negative loadings were interpreted according to the direction of the original coding. Prior to factor extraction, the suitability of the data for factor analysis was assessed using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity.

Principal component analysis was used as the extraction method, followed by Varimax rotation with Kaiser normalization. Factors were retained based on eigenvalues greater than 1 and interpretability of the extracted factor structure. For each retained factor, the eigenvalue, percentage of explained variance, and cumulative percentage of explained variance were reported. For all statistical tests, the level of significance was set at $\alpha = 0.05$. Statistical analysis was performed using IBM SPSS Statistics, version 21.

Ethics: The study protocol was approved by the Ethics Committee of the City Institute for Public Health, Belgrade (No. 59/1 V-2, January 26, 2026).

RESULTS

On the day of the survey, 13,384 employees were present at work, and 11,689 questionnaires were distributed. A total of 9,236 questionnaires were completed and returned, corresponding to a response rate of 79%. The present study included 6,899 healthcare professionals, representing 74.7% of all respondents who returned completed questionnaires in the participating healthcare institutions [15].

Among the 6,899 healthcare professionals included in the analysis, 5,202 were nurses and healthcare technicians, 1,568 were doctors, 68 were pharmacists, and 63 were dentists. The characteristics of healthcare professionals according to educational level and gender are presented in Table 1.

Among HPUD, no statistically significant gender differences were observed in age distribution or managerial position. However, male HPUD were significantly more likely to be involved in academic teaching and to have an additional healthcare job in the private sector. Among HPSEC, statistically significant gender differences were observed for age distribution, managerial position, participation in teaching, and additional work in the private sector.

Mean satisfaction scores related to professional relationships, communication, and career development opportunities are presented in Table 2.

HPUD reported significantly higher satisfaction scores than HPSEC for all analyzed items. These included the ability to apply knowledge and skills at work, recognition and evaluation of work, collaboration with colleagues, collaboration with superiors, opportunities for professional development and continuing medical education, receiving clear instructions regarding job expectations, and the ability to present ideas to superiors).

Mean satisfaction scores related to organization and working conditions are presented in Table 3.

HPUD reported significantly higher satisfaction scores for equipment, available time for job tasks, time available for patient interaction, autonomy in job performance, salary, and management quality and organizational work structure. The largest difference between the two groups was observed for autonomy in job performance.

Exploratory factor analysis was conducted separately for healthcare professionals with a university degree and those with secondary school or college education. The analysis identified three factors in both groups: “Organizational Culture and Personal Development”, “Working Conditions”, and “Workplace Change Intention” (Tables 4 and 5).

Overall, the factor structure was broadly similar in the two educational groups, although some differences were observed in the loading of individual items. In particular, patient perception of the employee appeared to be more closely related to working conditions among HPUD, whereas among HPSEC group it showed a weaker and more complex association with the first factor, “Organizational Culture and Personal Development”.

DISCUSSION

Health professionals in state hospitals in Belgrade are most satisfied with direct collaboration with colleagues and superiors, which is a critical motivational factor influencing the quality of services and patient safety [16]. However, work motivation can be adversely affected by conflicts among colleagues. Studies from Australia, Canada, and New Zealand highlight increasing conflict among nursing staff,

particularly new nurses, which often leads to higher turnover rates and a willingness to leave the job [17].

Assertive communication training is shown to improve communication skills, enhance mutual respect, and mitigate conflicts. Assertiveness involves honest, direct communication that respects the rights and feelings of others, which is crucial in minimizing workplace conflicts and fostering a positive work environment [17]. Nurses, compared to doctors, often face less autonomy, receive less support, and are more frequently exposed to workplace violence and injuries [18].

In our study, nurses and healthcare technicians were particularly less satisfied with opportunities for professional advancement, which suggests that career development policies should be more clearly defined for this group. Only 27% of doctors, dentists, and pharmacists and 16.9% of nurses and healthcare technicians expressed satisfaction with their income. These findings indicate that financial compensation remains an important source of dissatisfaction among healthcare professionals. However, the factor analysis showed that salary did not emerge as an independent dimension of job satisfaction, but was instead included within the broader “Working Conditions” factor. This finding is consistent with the results reported by Lorber and Skela Savič, who found that salary was part of a broader motivational factor rather than an independent determinant of job satisfaction [10]. The factor analysis provides additional insight into the structure of job satisfaction. The first factor, “Organizational Culture and Personal Development”, reflects higher-order aspects of work, including respect, professional identity, communication, participation, and personal growth. In this sense, the findings are compatible with Maslow’s hierarchy of needs, as they suggest that healthcare professionals’ job satisfaction is not determined only by material conditions, but also by recognition, belonging, self-esteem, and opportunities for self-actualization [19]. Nevertheless, the present study did not test Maslow’s theory directly, rather, the theory may provide one possible interpretative perspective for understanding why non-material aspects of work are important for healthcare professionals’ job satisfaction.

The second factor, “Working Conditions”, reflects the practical and organizational conditions under which healthcare professionals perform their daily work. The results suggest that dissatisfaction with salary should be interpreted together with other aspects of working conditions, rather than as an isolated problem. Therefore, managerial interventions should not focus solely on financial incentives, but should also address workload, staffing, equipment, time pressure, stress, and work organization. The third factor, “Workplace Change Intention”, was related to the intention to change jobs. This dimension is particularly important from the perspective of workforce planning and retention. Previous findings have shown that a considerable proportion of healthcare professionals consider changing their workplace, moving to the private sector, leaving healthcare, or working abroad [20, 21]. Such intentions may reflect accumulated dissatisfaction with working conditions, career opportunities, salary, and organizational support. In this context, systematic monitoring of health workforce mobility, timely replacement of personnel, and institutionalized transfer of knowledge and skills from experienced workers to younger

colleagues are essential components of strategic health workforce management [20, 21]. Compared with findings from other settings, our results show both similarities and differences. For example, a study conducted in Chhattisgarh, India, also reported dissatisfaction with salary among healthcare professionals, but unlike our study, it also found dissatisfaction with interpersonal communication [22]. In contrast, healthcare professionals in Belgrade hospitals reported relatively high satisfaction with collaboration with colleagues and superiors. Previous research has also emphasized that working conditions and contextual factors are important determinants of job satisfaction and willingness to remain in the profession [23].

The findings of this study suggest several practical implications that are directly related to the observed dimensions of job satisfaction. First, the results indicate that healthcare institutions and relevant authorities should systematically monitor job satisfaction among healthcare professionals and use these data to identify areas requiring organizational improvement.

Second, healthcare professionals with secondary school or college education reported lower satisfaction than healthcare professionals with a university degree across several analyzed domains. Improving their position may require stronger support systems in the workplace, clearer job descriptions, recognition of educational level and professional competencies, opportunities for career development, autonomy within the scope of practice, and support in demanding clinical settings (such as intensive care, transplant units, geriatric departments, emergency departments). Third, the identification of “Workplace Change Intention” as a separate factor suggests that intention to change workplace should be monitored as an important indicator of potential workforce instability.

Limitations and future research

Several limitations of this study should be acknowledged. First, the cross-sectional design does not allow causal relationships to be established between the analyzed factors and job satisfaction. Second, the study was based on self-reported questionnaire data, which may be influenced by subjective interpretation, response bias, and social desirability bias. Third, participation in the survey was voluntary; therefore, the views of healthcare professionals who did not participate could not be assessed, and non-response bias cannot be excluded.

Another limitation is that the analysis was based on an existing job satisfaction questionnaire developed for institutional monitoring purposes. Although this enabled the analysis of a large sample of healthcare professionals, the questionnaire was not specifically designed to examine all potential determinants of job satisfaction in detail. For example, the present study could not fully assess the effects of workload intensity, administrative burden, private-sector engagement, family obligations, exposure to workplace violence, or specific sources of occupational stress.

Future research should use more detailed and specifically designed instruments to examine how workload, stress, additional private work, work-life balance, and organizational support influence job

satisfaction and motivation among healthcare professionals. Longitudinal studies would be particularly useful for assessing changes in job satisfaction over time and for examining whether dissatisfaction with working conditions, salary, or career development predicts intention to change workplace or leave the healthcare system. Additional research should also focus on nurses and healthcare technicians, given that this group reported lower satisfaction across several domains.

CONCLUSION

Healthcare professionals reported the highest levels of satisfaction with collaboration with colleagues and superiors, suggesting that interpersonal relationships represent an important strength of the hospital work environment. In contrast, salary was the lowest-rated aspect of job satisfaction in both educational groups. However, factor analysis showed that salary was part of the broader “Working Conditions” factor rather than an independent dimension, indicating that financial dissatisfaction should be interpreted together with other aspects of the work environment, such as workload, equipment, available time for patient care, stress, and work organization.

The identification of “Workplace Change Intention” as a separate factor indicates that intention to change workplace represents a distinct aspect of job satisfaction in this sample. The findings provide descriptive and exploratory evidence on the structure of job satisfaction among healthcare professionals in Belgrade public hospitals and may serve as a basis for further research and more targeted organizational assessment.

Overall, the findings suggest that improving job satisfaction in hospital settings requires a multidimensional approach that addresses working conditions, professional development, recognition, communication, and retention, while preserving the positive aspects of organizational culture and interpersonal collaboration.

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Table 1. Characteristics of healthcare professionals according to educational level and gender (percentages)

Variable		Male	Female	Total	χ^2	p
Age	Less than 35	17.7%	17.5%	17.6%	0.009	$p \geq 0.05$
	35–54	57.7%	58%	57.9%		
	More than 55	24.6%	24.5%	24.5%		
Managerial position	Yes	32%	27.5%	29.2%	3.8	$p \geq 0.05$
	No	68%	72.5%	70.8%		
Academic career	Yes	36.5%	26.1%	30.3%	11.9	$p \leq 0.01$
	No	63.5%	73.9%	69.7%		
Additional healthcare job in private sector	Yes	44.5%	35.5%	39%	7.9	$p \leq 0.05$
	No	55.5%	64.5%	61%		
Health professionals with secondary education and college degree						
Age	Less than 35	42.7%	25.9%	28.2%	93.1	$p \leq 0.05$
	35–54	46.1%	60.6%	58.6%		
	More than 55	11.2%	13.5%	13.2%		
Managerial position	Yes	10.3%	13.4%	12.8%	7.9	$p \leq 0.01$
	No	89.7%	86.6%	87.2%		
Academic career	Yes	4.8%	2.6%	2.9%	4.8	$p \leq 0.05$
	No	95.2%	97.4%	97.1%		
Additional healthcare job in private sector	Yes	30%	16.1%	18%	37.5	$P \leq 0.05$
	No	70%	83.9%	82%		

 χ^2 test value, p value

Table 2. Satisfaction with professional relationships, communication, and career development opportunities among healthcare professionals in Belgrade public hospitals

Variable	Education	N	Mean	SD	t, p
q5	HPUD	1665	3.7	1.1	10.1*
	HPSEC	5088	3.4	1.1	
q6	HPUD	1674	3.4	1.3	11.2*
	HPSEC	5128	3	1.2	
q7	HPUD	1676	4	1	6.5*
	HPSEC	5123	3.8	1	
q8	HPUD	1669	3.9	1.1	9.5*
	HPSEC	5113	3.6	1.1	
q10	HPUD	1666	3.5	1.2	8.4*
	HPSEC	5080	3.2	1.2	
q13	HPUD	1675	3.6	1.1	8.9*
	HPSEC	5133	3.3	1.1	
q14	HPUD	1675	3.7	1.2	13.2*
	HPSEC	5131	3.2	1.2	

HPUD – health professionals with a university degree; HPSEC – health professionals with secondary education and college degree; q5 – ability to apply knowledge and skills at work; q6 – recognition and evaluation of work; q7 – collaboration with colleagues; q8 – collaboration with superiors; q10 – opportunities for professional development/continuing education (CME); q13 – receiving clear instructions regarding job expectations; q14 – ability to express ideas to superiors; t – Student's t-test value; SD – standard deviation;

* $p < 0.001$

Table 3. Satisfaction with organization and working conditions among healthcare professionals in Belgrade public hospitals

Variable	Education	N	Mean	SD	t, p
q1	HPUD	1685	3.3	1.2	4.3*
	HPSEC	5146	3.1	1.1	
q2	HPUD	1685	3.4	1.1	7.4*
	HPSEC	5141	3.2	1.1	
q3	HPUD	1587	3.3	1.2	6.5*
	HPSEC	4824	3.1	1.1	
q4	HPUD	1662	3.8	1.1	19.9*
	HPSEC	5039	3.2	1.1	
q11	HPUD	1675	2.7	1.2	11.3*
	HPSEC	5121	2.3	1.1	
q12	HPUD	1659	3.4	1.2	9.9*
	HPSEC	5087	3.1	1.2	

q1 – equipment; q2 – available time for job tasks; q3 – time available for patient interaction; q4 – autonomy in job performance; q11 – salary; q12 – management quality and organizational work structure; t – Student's t-test value; SD – standard deviation;

* $p < 0.01$

Table 4. Factor analysis of responses among the health professionals with university degree group

Item	Factor loading		
	Organizational culture and personal development	Working conditions	Workplace change intention
q14	0.814	0.218	-0.14
q5	0.803	0.366	
q8	0.8	0.137	-0.14
q13	0.755	0.405	
q4	0.745	0.202	0.287
q12	0.74	0.366	-0.21
q6	0.711	0.466	
q7	0.688		
q10	0.621	0.464	
q2	0.201	0.789	0.178
q3	0.266	0.763	0.191
q15		-0.663	0.272
q9	0.183	0.619	
q16	-0.16	-0.558	0.468
q11	0.385	0.51	-0.187
q1	0.367	0.501	
q17			0.767
Factor	Eigenvalue	% of variance explained	Cumulative %
Organizational culture and personal development	7.44	43.81	43.81
Working conditions	1.8	10.61	54.43
Workplace change intention	1.16	6.83	61.25

KMO = 0.866; Bartlett's test sphericity: $\chi^2 = 3157$, df = 231, $p \leq 0.001$;

Extraction Method: Principal Component Analysis;

Rotation Method: Varimax with Kaiser Normalization;

q1 – equipment; q2 – available time for job tasks; q3 – time available for patient interaction; q4 – autonomy in job performance; q5 – ability to apply knowledge and skills at work; q6 – recognition and evaluation of work; q7 – collaboration with colleagues; q8 – collaboration with superiors; q9 – patient perception of the employee; q10 – opportunities for professional development/continuing education (CME); q11 – salary; q12 – management quality and organizational work structure; q13 – receiving clear instructions regarding job expectations; q14 – ability to express ideas to superiors; q15 – stress level during work; q16 – satisfaction with the job compared with five years earlier; q17 – workplace change intention

Table 5. Factor analysis of responses among the health professionals with secondary school and college group

Item	Factor Loading		
	Organizational culture and personal development	Working conditions	Workplace change intention
q8	0.839	0.166	
q14	0.829	0.307	
q4	0.723	0.393	
q7	0.716		
q5	0.712	0.366	
q13	0.701	0.401	
q6	0.693	0.498	
q12	0.618	0.53	
q10	0.573	0.5	
q9	0.406	0.308	-0.302
q2	0.218	0.822	
q3	0.194	0.792	
q1	0.317	0.675	
q11	0.27	0.641	
q16	-0.279	-0.528	0.282
q15	-0.294	-0.514	0.248
q17			0.941
Factor	Eigenvalue	% of variance explained	Cumulative %
Organizational culture and personal development	8.13	47.83	47.83
Working conditions	1.23	7.25	55.08
Workplace change intention	1.02	6.02	61.1

KMO = 0.868; Bartlett's test sphericity: $\chi^2 = 8613$, df = 231, $p \leq 0.001$;

Extraction Method: Principal Component Analysis;

Rotation Method: Varimax with Kaiser Normalization;

q1 – equipment; q2 – available time for job tasks; q3 – time available for patient interaction; q4 – autonomy in job performance; q5 – ability to apply knowledge and skills at work; q6 – recognition and evaluation of work; q7 – collaboration with colleagues; q8 – collaboration with superiors; q9 – patient perception of the employee; q10 – opportunities for professional development/continuing education (CME); q11 – salary; q12 – management quality and organizational work structure; q13 – receiving clear instructions regarding job expectations; q14 – ability to express ideas to superiors; q15 – stress level during work; q16 – satisfaction with the job compared with five years earlier; q17 – workplace change intention