



# Assessment of patient safety perception nurses in health system of Bosnia and Herzegovina in COVID period: Descriptive and cross-sectional study

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## ABSTRACT

**Introduction:** Patient safety depends on a number of factors such as teamwork, working climate, employee satisfaction, work environment, stress awareness, management perception, and attitude. Nurses have a key role to play in protecting and supporting patients, and their assessment serves as a reliable predictor of overall hospital safety. A positive attitude toward patient safety is associated with a significant reduction in complications. The aim of the study was to analyze the perception of nurses about all aspects of patient safety in relation to the workplace and length of service.

**Methods:** The research included 647 nurses employed in health care institutions at the primary, secondary, and tertiary levels of health care. A descriptive and cross-sectional study included nurses from the Federation of Bosnia and Herzegovina. It was conducted in the period from November to December 2021, during the COVID pandemic. A standardized questionnaire on the perception of patient safety was used – Safety Attitudes Questionnaire – SAQ.

**Results:** The analysis of the examined factors in relation to the workplace of the respondents revealed a statistically significant difference in job satisfaction ( $p < 0.001$ ), as well as in the safety climate at work in relation to the workplace ( $p = 0.005$ ), working conditions ( $p < 0.001$ ), and management perception ( $p < 0.001$ ). Stress levels showed significant differences regarding working position ( $p = 0.017$ ), but also through the years of service ( $p = 0.012$ ). Stress was significantly correlated with teamwork ( $r = 0.124$ ;  $p = 0.003$ ), showing that better teamwork will help with stress.

**Conclusion:** The synthesis of concepts that includes patient safety and orientation toward patients should be implemented as a strategic quality orientation and set as a priority of every health-care system.

**Keywords:** Perception; patient safety; nurses; safety attitudes questionnaire

## INTRODUCTION

Patient safety depends on a number of factors such as teamwork, working climate, employee satisfaction, work environment, stress awareness, management perception, and attitude (1,2). The previous studies and literature showed certainty that knowledge of these safety factors is the basis for improving the safety performance of health-care providers (3,4).

The literature indicates that the frequency of medical errors and adverse outcomes is strongly influenced by the attitude of health professionals toward safety (5). Due to the nature of their work, nurses have a key role to play in protecting and supporting patients. Their assessment of patient safety serves as a reliable predictor of overall hospital safety. It is imperative that nurses engage with other health-care providers in creating and improving attitudes toward patient safety (6). A positive attitude toward patient safety is associated with a significant reduction in complications (7,8).

It is important that health-care organizations assess their patient safety culture to gain a clear understanding of patient safety aspects that require urgent attention and to identify the strengths and weaknesses of their safety culture. Studies on the culture of patient safety mainly come from developed countries (9-11).

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Several studies have sought to identify potential factors that influence nurses' perceptions of safety culture, including age, work experience, gender, safety training, unit type, staff position, job type, weekly hours, and hospital type (12).

Several factors such as age, gender, level of education, work experience, department, and working hours per week are usually related to the knowledge and attitude of nurses (13-17). Significant correlations have also been reported between nurses' attitudes and characteristics such as working position and the availability of patient safety training (18). Nurses are the largest group of health professionals who are most interactive with patients. The action of nurses is imperative for the adoption of safe practices and better health care (19,20). Awareness of the level of knowledge and attitudes of nurses toward patient safety and accompanying factors is crucial to take appropriate interventions and improve the overall knowledge and attitude toward patient safety and the quality of health care.

The aim of the study was to analyze the perception of nurses about aspects of patient safety in relation to the workplace climate, safety, and length of service.

## METHODS

A descriptive and cross-sectional study included nurses from the Federation of Bosnia and Herzegovina. The study represents a pilot project. It was conducted in the period from November to December 2021, during COVID pandemic. Ethical approval issued from Faculty of Health Science of University of Sarajevo was obtained before the study was enrolled. Furthermore, consent from competent Chambers was obtained. After obtaining the consent of the competent Chambers, the questionnaires were electronically distributed to respondents in a Google forms form. Respondents filled it out voluntarily and anonymously.

The research included 647 nurses employed in public health care institutions at the primary, secondary, and tertiary levels of health care. General information about gender, age, level of education, duration of professional service, and working position was obtained and analyzed. Furthermore, duration of service was classified according to the changes of the educational system. Age was not used as a variable, due to the fact that subjects in some subjects did not work directly after High school or University degrees. Criteria for inclusion: Work experience of more than 1 year, direct contact or interaction with the patient, and members of the Chamber of Nurses of the Federation of Bosnia and Herzegovina. Exclusion criteria: Work experience of <1 year, a position that does not require direct contact or interaction with the patient.

A standardized questionnaire on the perception of patient safety – Safety Attitudes Questionnaire (SAQ), which assesses the perception of nurses for six domains: Teamwork, safety, job satisfaction, management, stress, and work and in words (10).

It contains 35 questions, with a list of answers according to Likert ranging from 1 – I strongly disagree to 5 – I completely agree. It is an assessment tool with strong correlation and high adequacy for testing use. In our study, the internal consistency of individual factors and their total value was calculated with Cronbach's alpha (0.84). Factor analysis was also performed, which was tested using Bartlett's test of sphericity, and Kaiser-Meyer-Olkin was determined as an indicator

of sample adequacy. The collected data were entered into an electronic database created in Microsoft Office Excel 365. For statistical data processing, the statistical program IBM SPSS Statistics 26.00 (IBM Corporation, Armonk, New York) was used. Category variables are presented by frequency (frequency) as an absolute number or as a percentage per column (study group). The results of descriptive statistics were presented by arithmetic mean and standard deviation. ANOVA test was used to compare values of SAQ domains between examined groups. Pearson correlation was used to evaluate connections between SAQ domain in the general sample. Statistical significance was set with  $p < 0.05$ .

## RESULTS

The research included 647 nurses employed in health care institutions at the primary, secondary, and tertiary levels of health care in Bosnia and Herzegovina. Subsequent analysis found that out of the stated number, 51 respondents did not have direct contact with patients and were excluded from further analysis. A total of 596 respondents participated in the research, of which 481 (80.7%) were female and 115 (19.3%) were male (Table 1). Most respondents,

**TABLE 1.** General information about subjects

Variable	Description	n	%
Sex	Male	115	19.30
	Female	481	80.70
Age	18–25	51	8.60
	26–35	131	22.00
	36–50	288	48.30
	More than 50	126	21.10
Education	High school education	401	67.30
	University degree	195	32.70%
Position	Nurse who works in the clinic only morning shifts	106	17.79
	A nurse working in the ward without night shift	31	5.20
	Nurse	343	57.55
	Responsible nurse	35	8.57
	Head nurse at the department	29	4.87
	Head nurse of a clinic/ health institution	52	8.72
Length of work in your profession	1–5 years	135	22.7
	6–10 years	53	8.9
	11–15 years	68	11.4
	16–20 years	79	13.3
	21–30 years	197	33.1
	more than 30 years	64	10.7
Length of work in the institution where you currently work	1–5 years	160	26.8
	6–10 years	53	8.9
	11–15 years	29	4.9
	16–20 years	186	31.2
	21–30 years	168	28.2
Length of work at current job	more than 30 years	0	0.0
	1–5 years	266	44.6
	6–10 years	0	0.0
	11–15 years	212	35.6
	16–20 years	0	0.0
Length of work at current job	21–30 years	118	19.8%
	more than 30 years	0	0.0%

288 of them (48.3%) were aged 36-50 years. Concerning the level of education, 401 respondents (67.3%) had secondary education (SSS), and 195 (32.7%) respondents had a university degree. Of total number of subjects that were included in the study, 243 (40.8%) have worked in the primary health care, 152 (25.5%) have worked in the secondary health-care level, and 201 (33.7%) have worked in the tertiary level of health care.

Out of 596 analyzed respondents, 401 them worked as nurses, that is, 67.3% of all respondents. Out of the total number of 596 respondents, 106 (17.8%) were graduate nurses with a university degree. Furthermore, 53 subjects were with a degree of Bachelor of Health Care and therapy (8.9%). Furthermore, 33 respondents (5.5%) were Masters of Health Care and Therapy (VSS), and three respondents (0.5%) were Doctors of Health Sciences (Table 1).

Based on the position at work and the way of work, it was determined that out of 596 respondents, 343 of them work in the position of nurse employed in shifts, which represents 57.55% of respondents. There were 106 nurse, who work in the outpatient clinic only in the morning shift (17.79%). Furthermore, 31 (5.20%) nurses were working in the department without working the night shift.

In management were 35 (5.87% of all respondents) responsible nurses, 29 (4.87% of all respondents) chief nurses of the health institution/clinic and 52 respondents (8.72% of all respondents) were chief nurses of the ward. Based on the length of service, it was determined that the largest number of respondents has worked between 21 and 30 years in their profession (33.1%); 10.7% have been working for more than 30 years. From total number 22.7% of respondents answered that they are at the beginning of their career, working between 1 and 5 years in the profession. In the current employment institution, 26.8% of respondents work from 1 to 5 years, 31.2% work from 16 to 20 years, and 168 respondents (28.2%) work from 21 to 30 years in the current employment institution. Most respondents work in the same job, 44.6% work for 1–5 years, and 35.6% work for 11–15 years. One hundred and eighteen (19.8%) respondents work from 21 to 30 years of age (Table 1).

Based on the answers of all subjects, the highest grades on SAQ were given on the topic of job satisfaction with an average grade of  $3.54 \pm 1.1$ . Safety climate had a grade of  $3.28 \pm 1.04$ ; team work  $3.36 \pm 0.84$ . Working conditions had somewhat lower grade of  $3.23 \pm 1.12$ . Management perception had a lowest grade of  $2.94 \pm 1.08$ , and stress had an average grade of  $3.0 \pm 1.05$ . (Figure 1).

All six factors of SAQ were analyzed through correlation matrix. Average and positive correlation was found between job satisfaction and security climate ( $r = 0.666$ ;  $p < 0.001$ ), also it was in direct correlation with teamwork ( $r = 0.564$ ;  $p < 0.001$ ), working conditions ( $r = 0.578$ ;  $p < 0.001$ ), and management perception ( $r = 0.582$ ;  $p < 0.001$ ). Security climate also had an average, positive correlation with teamwork ( $r = 0.534$ ;  $p < 0.001$ ), working conditions ( $r = 0.585$ ;  $p < 0.001$ ) and management perception ( $r = 0.579$ ;  $p < 0.001$ ). Teamwork was the only factor that had a weak positive correlation with stress level ( $r = 0.124$ ;  $p = 0.003$ ). Working conditions were in direct positive correlation with other factors, except stress (Table 2).

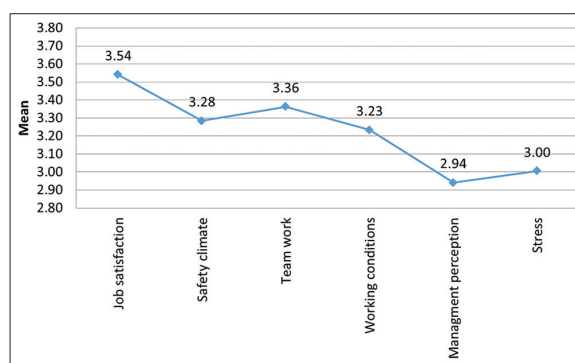


FIGURE 1. Average grades through SAQ in the total sample

The analysis of the examined factors concerning the workplace of the respondents (Table 3) revealed a statistically significant difference in job satisfaction ( $p < 0.001$ ), with the best grades given by the head nurses of the health institution ( $4.26 \pm 0.74$ ), and the lowest nurse working in the ward, without shifts ( $3.13 \pm 1.07$ ) (Table 3).

Furthermore, there was a statistically significant difference in the safety climate at work ( $p = 0.005$ ), with respondents working in the department without a night shift having the most negative attitude about the safety climate at work ( $2.91 \pm 1.03$ ).

Head nurses gave the highest grades regarding working conditions ( $p < 0.001$ ), and vice versa nurses working without the night shift gave the lowest grades ( $2.85 \pm 0.89$ ). There is also a statistically significant difference in terms of management perception ( $p < 0.001$ ), with the best grades given by the head nurse of the health institution ( $3.93 \pm 0.72$ ), and the worst grades by the nurse working in the department without work at night shift ( $2.74 \pm 0.86$ ). In perception of stress, it was found that significant differences in the intensity of stress,  $p = 0.017$ , in relation to the workplace. The greatest stress and the impact of the same on the performance of work were expressed by the chief nurses of health institutions ( $3.40 \pm 0.97$ ), and the least stress was expressed by the nurse working in shifts ( $2.90 \pm 1.04$ ).

The analysis of the examined factors in relation to the length of service (Table 4) determined that with the passage of time there is a decrease in job satisfaction ( $p = 0.001$ ). Furthermore, there was a decrease in the safety assessment for patients and health workers ( $p = 0.002$ ).

The length of service also indicates a decline in the personal assessment of teamwork ( $p = 0.025$ ), as well as working conditions ( $p = 0.096$ ). No significant difference in management perception was found ( $p = 0.134$ ). The length of work experience significantly influenced the perception of people about stress at work, with people with more years of work experience indicating higher stress at work ( $p = 0.012$ ).

Profession and work experience are statistically significantly related to the average results for all patient safety factors, except for teamwork in relation to the workplace, and the perception of management in relation to the length of service.

## DISCUSSION

In this study, the most positive attitudes about patient safety were found in the domains "job satisfaction" and

**TABLE 2.** Correlation between SAQ factors in the whole sample

Variable		Security climate	Teamwork	Working conditions	Management perception	Stress
Job satisfaction	r	0.666	0.564	0.578	0.582	-0.023
	p	<0.001	<0.001	<0.001	<0.001	0.575
Security climate	r	1.000	0.534	0.585	0.579	0.078
	p		<0.001	<0.001	<0.001	0.059
Teamwork	R	0.534	1.000	0.587	0.581	0.124
	p	<0.001		<0.001	<0.001	0.003
Working conditions	r	0.585	0.587	1.000	0.684	0.050
	p	<0.001	<0.001		<0.001	0.228
Management perception	r	0.579	0.581	0.684	1.000	0.050
	p	<0.001	<0.001	<0.001		0.226
Stress	r	0.078	0.124	0.050	0.050	1.000
	p	0.059	0.003	0.228	0.226	

**TABLE 3.** Analysis of the examined factors in the workplace in comparison to the working position

Variable	Value	Job satisfaction	Security climate	Team-work	Working conditions	Management perception	Stress
Work position							
Head nurse of the ward	Mean	3.82	3.30	3.52	3.35	3.03	2.90
	SD	0.90	1.06	0.60	0.96	1.01	1.06
The chief nurse of the health institution	Mean	4.26	3.91	3.63	4.20	3.93	3.40
	SD	0.74	0.80	0.57	0.55	0.71	0.97
Shift nurse	Mean	3.47	3.30	3.33	3.19	2.86	2.90
	SD	1.13	1.03	0.82	1.13	1.07	1.04
Ward nurse without working a night shift	Mean	3.13	2.91	3.26	2.85	2.74	3.32
	SD	1.07	1.03	0.69	0.89	0.86	1.00
A nurse working only morning shift	Mean	3.49	3.16	3.30	3.15	2.86	3.16
	SD	1.17	1.05	0.97	1.16	1.15	1.06
Responsible nurse	Mean	3.61	3.32	3.42	3.25	3.13	3.09
	SD	1.13	1.06	1.07	1.23	1.12	0.97
F		4.351	3.369	1.288	5.454	6.046	2.783
p		0.001	0.005	0.267	<0.001	<0.001	0.017

**TABLE 4.** Analysis of the examined factors in the workplace in comparison to the length of service

Variable		Job satisfaction	Security climate	Teamwork	Working conditions	Management perception	Stress
Working in profession (years)							
1–5 years	Mean	3.86	3.60	3.49	3.43	3.15	2.75
	SD	1.01	0.91	0.86	1.21	1.12	1.07
6–10 years	Mean	3.21	3.09	3.31	3.22	2.85	2.97
	SD	1.25	1.07	0.82	1.04	1.02	0.94
11–15 years	Mean	3.32	3.13	3.38	3.10	2.86	2.94
	SD	1.14	1.08	0.81	1.11	1.09	1.00
16–20 years	Mean	3.58	3.28	3.34	3.22	2.92	3.22
	SD	0.98	1.00	0.82	0.99	1.05	0.98
21–30 years	Mean	3.52	3.25	3.39	3.25	2.93	3.04
	SD	1.14	1.09	0.80	1.10	1.10	1.08
more than 30 years	Mean	3.30	3.04	3.04	2.94	2.72	3.23
	SD	1.14	0.97	0.91	1.17	0.97	1.03
F		4.415	3.945	2.583	1.882	1.692	2.946
p		0.001	0.002	0.025	0.096	0.134	0.012

“working conditions” with scores of 4.26 and 4.20, respectively, while the most negative attitudes were found in the “safety climate” with a score of 2.91, “working conditions” with a score of 2.85, “management perception” 2.74 by nurses working in the ward without work in the night shift, and by nurses working in the clinic only the morning shift “management perception” is rated 2.86. Lower grades were also given for the “stress” domain, with the lowest scores

being given to the ward nurses 2.90, as well as those working shifts.

Statistically significant differences were found between the attitudes about patient safety in relation to the years of experience of the participants. These results are not consistent with other studies (21-23). Nabhan and Ahmed-Tawfik found that the safety culture is higher among nurses with less than a year of work experience compared to nurses



who have worked for a long time (24). Our results are consistent with some studies that found that attitudes toward patient safety increase with years of experience (23,25).

El-Jardali et al. found that patient safety scores increased with years of experience and peaked among those who had working experience between 11 and 15 years. After that, the results started to decline with the lowest results reported by those who had 21 or more years of experience. This may be a reflection of newly graduated Iranian health professionals seeking career advancement to a certain point, but also a loss of motivation and interest, thereafter, leading to a decline in their attitudes about patient safety (26).

Younger respondents had significantly higher mean scores for patient safety factors. Average results for recognizing stress tended to increase with increasing years of service ( $p = 0.016$ ).

Higher working positions are also associated with significantly higher average scores for teamwork climate, safety climate, job satisfaction, and working conditions.

In the study by Bahar and Önlü, only management's perception resulted in statistically significant differences, based on age differences, while years of work experience did not have statistically significant differences. The management perception of nurses between the ages of 18 and 30 is significantly higher than that of nurses between the ages of 31 and 40 (3). This finding contradicts previous studies in which the safety attitudes of older nurses were rated higher than those of their younger counterparts, with Elsous stating that safety culture varies depending on the position of the nurse, age, work experience, and working hours. Head nurses had more positive attitudes toward patients than first-line clinicians. The more experience nurses had the better their attitudes toward patient safety (23), while Danielson stated in a multivariate analysis that long professional experience (>15 years) was associated with an increased likelihood of high overall patient safety (27).

### Limitations of the study

In this study, gender and the level of health care were not considered and will be the subject of future research in the second phase of the study. Furthermore, one of the reasons for this decision is the pandemic caused by the SARS-CoV-2 virus and difficult access for respondents.

### CONCLUSION

The synthesis of concepts that includes patient safety and orientation toward patients should be implemented as a strategic quality orientation and set as a priority of every health-care system. Experienced health care workers opinion about working conditions, and sometimes even teamwork quality is declining through time. Health care workers working on higher position will have better opinion about their institution and about patients' safety in it. Patient safety should be embedded in the education and lifelong learning of health care workers to develop the necessary competencies in providing safe care. Health-care organizations must prioritize a culture of patient safety and make decisive changes arising from their assessments.

Conducting education on patient safety and risk management at all levels of the health system reflects the message

that the patient is at the center of the health system. There is a need for wide implementation in graduate and post-graduate education of health workers and continuous professional education of health professionals. Patients and citizens should be encouraged to actively participate in the patient safety process. It is necessary to increase knowledge and awareness of risk factors. Patients' associations and the media play a key role to change the perception of responsibility for patient safety and develop guidelines for the responsible attitude of all involved in the health-care process.

### DECLARATION OF INTERESTS

The authors declare no conflicts of interests.

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