

## ***Risk Assessment and Perception of Healthcare Professionals in the Age of the Covid-19 Pandemic.***

Alma Mizdrak <sup>1\*</sup>, Arzija Pasalic <sup>2</sup>, Elmedina Mrkulic <sup>3</sup>,  
Amina Luckin <sup>4</sup>, Zineta Mulaosmanovic <sup>5</sup>

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### ***Abstract***

**Introduction:** Knowledge of all safety factors: teamwork, employee satisfaction, work environment, stress awareness, risk perception and attitude are the basis for improving the safety performance of health care providers - health professionals. The aim of the research is to analyze the risk perception of health professionals on aspects of occupational safety in relation to the workplace during the COVID-19 pandemic.

**Methods:** A descriptive cross-sectional study included health professionals of all profiles from the Sarajevo Canton. It was conducted in the period from November to the end of December 2021. Respondents voluntarily and anonymously filled out a survey questionnaire, distributed electronically in the Google forms form.

**Results:** The research included 266 health professionals of all profiles employed in health care institutions at the primary, secondary and tertiary levels of health care.

**Conclusion:** The concept of risk perception of health professionals in a pandemic should be viewed as a group rather than an individual phenomenon.

**Keywords:** risk perception, health care institutions, health professionals, COVID –19

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### **\* Corresponding author:**

Alma Mizdrak MD

✉ [alma.mizdrak@yahoo.com](mailto:alma.mizdrak@yahoo.com)

1 Clinic for Infectious Disease Clinical Center of Sarajevo University, Faculty of Health Studies, University of Sarajevo, BOSNIA AND HERZEGOVINA.

2 Department of health Nutrition and Dietetics, Faculty of Health Studies, University of Sarajevo, BOSNIA AND HERZEGOVINA

3 Pediatric Clinic Center of Sarajevo, Faculty of Health Studies, University of Sarajevo, BOSNIA AND HERZEGOVINA

4 Department of Orthopedics and Traumatology Clinic Center of Sarajevo, Faculty of Health Studies, University of Sarajevo, BOSNIA AND HERZEGOVINA.

5 Health Center of Canton Sarajevo, Faculty of Health Studies, University of Sarajevo, BOSNIA AND HERZEGOVINA.

### ***Introduction:***

The modern definition of risk as “the likelihood or possibility of loss, injury, or other adverse or undesirable circumstance” of the Oxford English Dictionary has a long and complicated history of the term. Although there is a lack of consensus on the actual origin of the word, it is assumed that the root of the word “risk” comes from the Italian word *risco*, derived from the verb *riscare* meaning “to run into danger”. [1]

Risk management is an area that has been researched by various authors for years with the aim of improving practices. In the world of various theories, some of them stand out and most closely connect practice with theory. McGowan et al described risk management as a set of clinical and administrative systems, processes, procedures

and reporting structures designed to detect, monitor, assess, mitigate and prevent risks to patients [2].

The general scheme of risk management, within the framework of international risk management standards ISO 31000, consists of several key phases, namely: definition of the organizational context, risk identification, risk analysis, risk assessment, risk treatment, monitoring and review, and communication and consultation, which cover the entire process [3]. During the provision of health services, the rights of service users, legal regulations and regulations in the health organization, i.e. administrative measures with accompanying risks, which, if not fully complied with, may lead to legal disputes must be taken into account [4].

Constant monitoring of all processes in a healthcare facility while complying with regulations, modern management of all resources, especially human resources, because 75% of wealth is the human factor [5]. Healthcare workers are often exposed to a high risk of stress, and burnout is the main concern in the field of health at work [6]. Healthcare workers face a lot of stress in their work because they have extended working hours, a wide range of tasks and complex relationships with patients, their families and other colleagues. In order to prevent and reduce burning, understanding its determinants is very important [7].

During the outbreak of the SARS-COV-2 virus, health workers face increased psychological pressure, which is manifested in higher levels of stress, anxiety and depression, and even psychological disorders [8, 9]. In addition to psychological symptoms, frontline healthcare workers are at increased risk of viral infections and sudden death and overwork-related disorders, including cardiovascular disease [10]. Currently, the world is living with a rapidly developing viral infection, the disease Coronavirus 2019 (COVID-19), a pandemic that is drastically changing people's lives, bringing with it unprecedented dangers to mental health [11]. In March 2020, the World Health Organization (WHO) classified SARS-Cov-2 virus infection as a pandemic [12].

We can assess the impact of the pandemic on health systems as there is a large body of empirical evidence documenting the challenges and disruptions. It finds that the effects of the pandemic on healthcare professionals (HCPs) are multiple. The effects of the pandemic on healthcare professionals (HCPs) highlight the multiple ways that the Covid-19 pandemic poses a significant threat to their physical, psychological and social well-being [13, 14]. Organization and management of work, e.g., excessive workloads and work intensity, lack of worker involvement in decision-making that affect the worker (autonomy), poorly managed organizational changes, ineffective communication, agreed working hours and poor balance between work and private life [14]. It is known that healthcare workers are exposed to various PSR - psychosocial risks at work [15, 16]. And epidemics of infectious diseases worsen the risks [17, 18].

Nurses have been found to be particularly exposed to PSR [19, 20] and exposed to physical dangers, and psychosocial risks in health care arise from overtime, work

overload and lack of time [21, 22], insufficient number of rest breaks and days of absence from work, leading to poor work-life balance [23]; shift work [24, 25, 26] and low wages and job insecurity [27]. Longer quarantine, lack of practical support and stigma also contributed to insecurity. Measures related to various aspects of the work environment in combination with individual interventions are shown to be the most effective solution for the prevention of PSR; individual measures, especially when they are mainly aimed at the individual worker, do not prove to be very effective [29]

## Material and Methods

A descriptive cross-sectional study included health professionals from the Sarajevo Canton. It was conducted in the period from November to the end of December 2021. Respondents voluntarily and anonymously filled out a questionnaire, distributed electronically, as a Google forms form.

The research included 266 health professionals employed in health care institutions at the primary, secondary and tertiary levels of health care.

A standardized questionnaire was used - WHO - questionnaire - survey of perceptions of health professionals. WHO (2020) (Health workers perception survey on Covid-19).

Part A presents 8 questions on the mental-psychological aspect (do you rely on verified information about Covid 19, do you sleep more or less or normally, do you have contacts with family and friends, do you practice religious and spiritual practices, yes do you feel fear and care for your loved ones, do you feel anger, fear because friends, family has unfounded fear because of contact with you because of your job. The answers are YES AND NO

Part 2 of the questionnaire: Part B contains 25 questions about stress (are you tired, have a hard time resting, have a hard time making decisions, your heart beats faster and you breathe poorly, have trouble thinking, eat little or too much, have headaches, feel emotionally dull, you think about your problems during the day, you have trouble sleeping, nightmares, you have a problem with hope, you behave dangerously to health and safety, you have chronic tension, use nicotine and caffeine more than before, you feel helpless, I have nervous habits, I forget some things, you have stomach upset, are you irritable, have mood swings, have difficulty concentrating, have an opinion that life is meaningless, are you withdrawn from other people. The possibility of answer is from 0-4 (0 - never, 1- rarely, 2 - sometimes, 3-usually, 4 - always)

After the research, the collected data were entered into an electronic database created in Microsoft Office Excel 365. The statistical program IBM SPSS Statistics 26.00 (IBM Corporation, Armonk, New York) was used for statistical data processing. Statistical significance was set with a p value less than 0.05. Category variables are presented by frequency (frequency) as an absolute number

or as a percentage per column (study group). The results of descriptive statistical risk analysis are presented by arithmetic mean and standard deviation. The statistical program SPSS will be used for statistical analysis of data. Depending on the data distribution, parametric and non-parametric tests will be used.

## Results

In relation to the level of health care, it was found that respondents employed at the tertiary level of health care sleep more than in the period before the pandemic, ie 22.9% of them said they sleep longer, compared to 8.3%

of respondents employed at the tertiary level. PHC and 5% on SPZ. A significant difference was found at the level of  $p = 0.002$ . It was also found that 73.7% of respondents who perform their jobs in primary health care maintain regular contact with friends and relatives. Contact with friends and family is maintained by 57.9% of employees at the SES and 48.1% of respondents employed at the tertiary level.

A significant difference was found at the level of  $p = 0.004$ . In the frequency of practicing religious rites, it was found that there is a significant difference in the distribution of responses ( $p = 0.025$ ). Also, additional fear and care for their own health and the health of those they love is felt daily by 64% of respondents employed at the primary level

Statement	Description	CCD		SZZ		TZZ		X <sup>2</sup>	P
		N	%	N	%	N	%		
Do you rely on verified sources of information for your COVID-19 education?	No.	14	14.1	9	8.6	7	13.5	1.72	0.423
	Yes	85	85.9	96	91.4	45	86.5		
Do you take breaks from work to take a deep breath and focus on your breathing?	No.	74	77.9	68	65.4	36	67.9	3,984th most common	0.136th most common
	Yes	21	22.1	36	34.6	17	32.1		
Do you sleep less than usual (without the COVID epidemic)?	No.	54	55.1	49	45.8	27	51.9	1.82	0.403
	Yes	44	44.9	58	54.2	25	48.1		
Do you sleep more than usual (without the COVID epidemic)?	No.	88	91.7	95	95.0	37	77.1	12,142th most common	0.002
	Yes	8	8.3	5	5.0	11	22.9		
Do you maintain regular contact with friends and relatives?	No.	26	26.3	45	42.1	28	51.9	10,925th most common	0.004
	Yes	73	73.7	62	57.9	26	48.1		
Would you accept the psychosocial need to be offered?	No.	25	25.5	18	17.1	10	18.5	2,353th most common	0.308
	Yes	73	74.5	87	82.9	44	81.5		
Has there been a change in the frequency of practicing religious rites?	No.	67	69.8	61	57.5	42	77.8	7,353th most common	0.025
	Yes	29	30.2	45	42.5	12	22.2		
Do you feel additional fear or concern for your own health and the health of those you love?	No.	36	36.0	15	13.9	14	26.4	13,655th most common	0.001
	Yes	64	64.0	93	86.1	39	73.6		
Do you feel sadness, anger, frustration, because some of your friends or loved ones are afraid of you and consider risk illness, because of the type of work?	No.	67	68.4	48	44.4	29	53.7	11,978 th most common	0.003
	Yes	31	31.6	60	55.6	25	46.3		

Table 1 Practice on the life of health workers during the pandemic in relation to the level of health care

Description	CCD	SZZ	TZZ	P
I feel tired	1.95 ± 0.9	2.49 ± 0.85	2.37 ± 1.09	<0.001
It is very difficult for me to relax	1.83 ± 1.08	2.11 ± 1.04	2.13 ± 1.01	0.095
I have a hard time making decisions	1.4 ± 0.95	1.65 ± 1.08	1.67 ± 0.73	0.123
My heart is pounding and I'm breathing fast	1.27 ± 1.14	1.75 ± 1.13	1.69 ± 1.13	0.007
I have a problem thinking clearly	1.12 ± 1.04	1.45 ± 1.09	1.52 ± 1	0.033th most common
I eat more than usual	1.22 ± 1.01	1.44 ± 1.2	1.48 ± 1.02	0.257
I have no appetite and eat less than usual	0.77 ± 0.9	0.9 ± 1	1.06 ± 0.96	0.206
I have headache frequencies	1.43 ± 1.06	1.78 ± 1.11	1.54 ± 1.26	0.087
I feel emotionally dull.	1.05 ± 1.09	1.34 ± 1.15	1.25 ± 1.17	0.18
I think about my problems again during the day	1.34 ± 1.05	1.65 ± 1.17	1.47 ± 1.1	0.149th most common
I have trouble sleeping (insomnia, nightmares)	1.2 ± 1.15	1.51 ± 1.27	1.51 ± 1.17	0.147th most common
I feel I am not contributing my work	0.59 ± 0.94	0.65 ± 0.93	0.54 ± 0.87	0.753
I take unnecessary risks and risk my own health	1.32 ± 1.12	1.36 ± 1.27	1.49 ± 1.21	0.702
I have back and neck pain, or some other chronic pain associated with stress and tension at work.	1.71 ± 1.17	2.19 ± 1.29	2.11 ± 1.19	0.015
I use cigarettes more than usual	0.8 ± 1.09	1.12 ± 1.31	1.08 ± 1.27	0.141th most common
I consume more coffee than usual	1.07 ± 1.18	1.38 ± 1.19	1.15 ± 1.16	0.158th most common
I feel helpless	0.84 ± 1.12	1.16 ± 1.21	1.12 ± 1.09	0.127
I show signs of nervousness (biting teeth, clenching teeth, fast gait)	0.85 ± 1.07	1.12 ± 1.23	0.92 ± 1.09	0.216
I forget the little things (where you left the key, the names of the people, the things you talked about earlier at work)	1.26 ± 1.12	1.51 ± 1.18	1.62 ± 1	0.111
I have stomach problems	1.04 ± 1.12	1.23 ± 1.18	1.1 ± 0.98	0.468
I feel irritable and easily annoyed	1.16 ± 1.13	1.51 ± 1.15	1.52 ± 1.04	0.055
I have mood swings	1.19 ± 1.06	1.61 ± 1.07	1.6 ± 1.01	0.009
It's hard for me to concentrate	1.08 ± 1.08	1.32 ± 1.11	1.5 ± 1.09	0.068
I have a hard time realizing that my life is purposeful	0.81 ± 1.09	0.95 ± 1.15	0.98 ± 1.09	0.569th most common
I am withdrawn and I feel cut off from other people	0.74 ± 1.1	0.97 ± 1.17	0.8 ± 1.04	0.331th most common
I use alcohol and / or drugs to cope with everyday life	0.31 ± 0.83	0.15 ± 0.56	0.17 ± 0.51	0.214
Explanation of grades: 0 - Never; 1 - Rare; 2 - Sometimes; 3 - Often; 4 - Always				

Table 2. Analysis of the physical and emotional state of the respondents in relation to the level of health care.

of health care, 86.1% of respondents employed at the SES and 73.6% of respondents employed at the TZZ. There was a significant difference at the level of  $p = 0.001$ . Feelings of sadness, anger, frustration, because someone in their environment is afraid of them and consider them a risk for possible illness are felt by 31.6% of respondents in PHC, 55.6% of respondents in PHC and 46.3% of respondents in PHC.

A significant difference was found at the level of  $p = 0.003$ .

In relation to the given assessment, it was found that respondents from the primary level of health care were significantly less likely to feel tired than respondents from the secondary and tertiary levels of health care ( $p < 0.001$ ). Also, respondents at the primary level of health care were significantly less likely to have feelings of heart palpitations and rapid breathing ( $p = 0.007$ ). Tertiary-level respondents were somewhat more likely to report having trouble thinking clearly ( $p = 0.033$ ).

Back pain was significantly more often reported by respondents in the secondary and tertiary levels compared to respondents in the primary level of health care ( $p = 0.015$ ). Mood swings were also significantly less frequently

reported by respondents from the primary health care level ( $p = 0.009$ ).

In relation to the emotional response, there was no difference in the assessment of the fear that some of the family members will get sick, as well as in relation to the behavior when someone comes from an area with a large spread of the virus. Most respondents are not sure if they are nervous about the epidemic.

In relation to the level of health care, it was determined that the non-compliance of the respondents from PHC was more present, stating that the COVID-19 epidemic was expressed in the community, in relation to the attitude of respondents from secondary and tertiary levels ( $p = 0.002$ ). Also, PHC respondents least agree with the view that the spread of COVID-19 is very intense ( $p = 0.036$ ). Respondents from the secondary and tertiary levels mostly agree with the statement that COVID-19 is difficult to treat ( $p = 0.017$ ).

Respondents employed in PHC significantly less agree with the statement that they are afraid that they or one of the family members will get sick ( $p = 0.01$ ). Also, the lowest score of fear of contact with people coming from areas with a high spread of the virus was found in primary health care

Emotional response	SSS		VŠS		VSS		P
	N	%	N	%	N	%	
I'm afraid that I or one of my family members will get sick	2.47	0.89	2.29	0.83	2.22	1.12	<b>0.15</b>
I am afraid when someone comes from an area with a large spread of the virus, or travels to the same place	2.47	0.94	2.33	0.98	2.28	1.09	<b>0.35</b>
I am very nervous about the epidemic.	1.99	1.02	2.07	0.88	1.98	1.18	<b>0.96</b>
Average rating of emotional response	2.25	0.71	2.47	0.64	2.46	0.71	<b>0.46</b>
Ratings: 0 - I explicitly disagree; 1 - I disagree; 2 - I'm not sure; 3 - I agree; 4 - I strongly agree							

Table 3. Attitudes of respondents about COVID-19 and their family.

Attitude about risk	CCD		SZZ		TZZ		P
	N	%	N	%	N	%	
It is very likely that I will become infected	2.03	1.00	2.04	0.93	2.15	0.84	<b>0.722</b>
I will only get infected from staying in the patient room	1.40	0.81	1.46	0.87	1.42	0.82	<b>0.872th most common</b>
The COVID-19 epidemic is very pronounced in my community	2.02	0.99	2.48	0.84	2.19	0.94	<b>0.002</b>
The spread of COVID-19 is very intensive	2.29	0.95	2.61	0.77	2.47	0.95	<b>0.036th most common</b>
This epidemic is very serious	2.72	0.94	2.96	0.85	2.94	0.93	<b>0.139th most common</b>
Mortality is high from COVID-19	2.48	0.99	2.71	1.05	2.77	0.96	<b>0.161th most common</b>
If you get sick, it has a huge impact on your health	2.62	0.96	2.83	0.88	2.83	0.87	<b>0.207</b>
COVID-19 is difficult to treat	2.24	1.04	2.63	0.84	2.50	1.02	<b>0.017</b>
The spread of the virus is difficult to control	2.60	1.04	2.73	0.96	2.85	1.02	<b>0.323th most common</b>
Average risk attitude rating	2.3	0.81	2.22	0.8	2.16	1	<b>0.051</b>
Ratings: 0 - I explicitly disagree; 1 - I disagree; 2 - I'm not sure; 3 - I agree; 4 - I strongly agree							

Table 4. Attitude of respondents about COVID-19 in relation to the level of health care

Emotional response	CCD		SZZ		TZZ		P
	N	%	N	%	N	%	
I'm afraid that I or one of my family members will get sick	2.12	1.08	2.55	0.88	2.45	0.91	<b>0.01</b>
I am afraid when someone comes from an area with a large spread of the virus, or travels to the same place	2.20	1.03	2.57	0.96	2.35	0.99	<b>0.02</b>
I am very nervous about the epidemic.	1.88	1.06	2.04	1.07	2.09	1.10	<b>0.41</b>
Average rating of emotional response	2.06	0.94	2.37	0.82	2.30	0.86	<b>0.032</b>
Ratings: 0 - I explicitly disagree; 1 - I disagree; 2 - I'm not sure; 3 - I agree; 4 - I strongly agree							

Table 5. Attitudes of respondents about COVID-19 and persons in their household in relation to health care levels

Question	The answer	SSS		VSS		VSS		P
		N	%	N	%	N	%	
Are there any COVID-19 confirmed cases in your health department?	No.	14	9.8	1	6.7	13	13.1	0.159th most common
	Unknown	13	9.1	4	26.7	7	7.1	
	Yes	116	81.1	10	66.7	79	79.8	
Do you have separate rooms and departments for COVID-19 confirmed cases in your institution?	No.	11	7.6	1	6.7	8	8.1	0.951
	Unknown	5	3.4	0	0.0	4	4.0	
	Yes	129	89.0	14	93.3	87	87.9	
Are you part of a team that works mostly with COVID-19 patients?	No.	51	35.2	6	40.0	56	56.6	0.017
	Unknown	5	3.4	1	6.7	4	4.0	
	Yes	89	61.4	8	53.3	39	39.4	
Is the necessary personal protective equipment continuously available for the treatment of patients with COVID-19?	Yes	74	70.5	7	70.0	46	78.0	0.861
	Yes, but not all equipment	22	21.0	2	20.0	6	10.2	
	Yes, surgical / medical masks are always available	6	5.7	1	10.0	5	8.5	
	Yes, N95 or FFP3 are always available	2	1.9	0	0.0	1	1.7	
	Disposable wards are always available	1	1.0	0	0.0	1	1.7	
	Gloves are always available	0	0.0	0	0.0	0	0.0	
If you are caring for a patient with COVID-19, how long is your longest exposure to the virus, within 1 meter of the patient	<2 minutes	9	6.5	0	0.0	6	6.5	0.797th most common
	2 to 5 minutes	9	6.5	1	7.1	11	11.8	
	5 to 15 minutes	20	14.4	3	21.4	17	18.3	
	> 15 minutes	66	47.5	6	42.9	36	38.7	
	Not applicable	35	25.2	4	28.6	23	24.7	

Table 6. Practice in the ward in relation to the presence of COVID patients

( $p = 0.02$ ). Overall, a significant difference in assessment was found ( $p = 0.032$ ).

It was found that 61.4% of respondents with secondary education are part of a team that works mostly with COVID-19 patients. The same was answered by 53.3% of respondents with a university degree and 39.4% of respondents with a university degree. Based on their education, a significant difference in participation in working with COVID patients was determined.

## Discussion

During the month of April, *V. Raghavan et al.* (2020) conducted a survey in 8 provinces in Afghanistan where 213 health workers participated, where it was found that the majority of health workers (77% in total and 80% among those who responded to COVID) relies on verified sources of information related to COVID 19 and actual facts. Out of 213 health professionals, 76% have sleep problems. They stated that there are other types of sleep problems (difficulty sleeping, problems waking up, nightmares).

*Hunger and co-workers* (2020) conducted a survey on the knowledge, attitude and fear of health workers towards the COVID 19 pandemic in Southern Nigeria and proved fear of infection and prejudice can lead to non-fulfillment of all obligations.

*Olum et al* (2020) conducted a survey on the knowledge of attitudes and practices of health workers at University Hospitals in Uganda where it was proven that a large percentage of health workers have knowledge of a new coronavirus pandemic, despite the fact that over 100 health workers lost their lives.

*Wahed et al* (2020) conducted an assessment of workers' perceptions of COVID infection in Egypt where a high degree of fear of infection and transmission was demonstrated and where emphasis was placed on administrative and psychological support of health workers, found that as many as 83.1 % of respondents were afraid that they would be infected with SARS-COV 2 and the potential risk of passing it on to their family.

*Koontalay A. et al* (2021) during the Covid-19 pandemic conducted a study involving 498 participants

(physicians, nurses, pediatric nurses, paramedics, support staff, and physiotherapists). Our findings are divided into four main topics as follows: inadequate preparedness; emotional challenges; insufficient equipment and information; and burnout at work. The results of the study show that the COVID-19 pandemic has affected all aspects of life, especially health care providers working on the front lines. The pandemic affected the physical and mental health of workers at the forefront, causing them to experience emotional stress such as fear, anxiety, depression and stress. In addition, a pandemic can increase post-traumatic stress disorder, leading to burnout and disruption of health care to ensure patient safety and the high quality of care provided to patients.

Hummel S. et al (2021) conducted a study in eight European countries where it was confirmed that COVID-19 has caused a huge psychological burden on the population, especially among doctors and nurses who face a high risk of infection and increased workload. They hypothesized that health care workers, especially those exposed to COVID-19 at work, would have higher levels of depression, anxiety, and stress. They also aimed to identify their main stressors and the most commonly used coping strategies during the crisis. "Uncertainty about when the epidemic will be under control" caused the greatest stress for health workers, while "taking protective measures" was the most commonly used coping strategy among all participants.

## Conclusion:

The concept of risk perception of health professionals in a pandemic era should be viewed as a group rather than an individual phenomenon.

Assessing and measuring risk becomes an important indicator of strengths or weaknesses in a health care institution, and at the same time a starting point for planning and undertaking activities and measures for improvement.

Further education of health professionals on the risk and perception of occupational risk in a pandemic, combined with practices that prevent adverse events, can increase occupational safety. This goal will be better achieved if health professionals are encouraged to participate in safety measures and security issues.

The main goal is to improve the satisfaction of the work of health professionals during the Covid-19 pandemic, through the effective application of procedures, including continuous improvement of management systems, clinical processes and ensuring compliance with specific requirements. Risk-based thinking is an important requirement of all standard

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