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MANAGEMENT OF MIGRATION OF PERSONNEL IN HEALTHCARE WITH AN EMPHASIS ON NURSES AND TECHNICIANS IN THE REPUBLIC OF CROATIA

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Abstract: *Active management of personnel in healthcare is a dynamic process that needs to be decided by the guidelines of the healthcare reform. Health personnel is considered the greatest and most important potential of health care, the basic intention is to strengthen health personnel of all profiles in accordance with the needs of society. The importance of the role of nurses in providing care in hospitals and long-term care facilities under normal circumstances was particularly pronounced during the COVID-19 pandemic. The lack of high- and middle-level health workers is not an isolated phenomenon in Croatia but also exists at the level of the entire EU, therefore the description of jobs and responsibilities increases according to the level of education. The aim of this work is to analyze the management of human resources in healthcare with an emphasis on senior and middle staff, and here we mean nurses and technicians. The scientific contribution of this work is manifested in the detection of socio-political and economic causes of the failure to train an adequate number of qualified health workers, as well as insufficient steps in their attraction and retention.*

Keywords: *Migration, Nurses and medical technicians, Personnel management in health care.*

JEL Classification I11· O15

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1. INTRODUCTION

The total number of health workers has been steadily increasing over the past two decades. In the health care system, the employees represent the offer, and the demand is the employer, while this demand should be dependent on the needs of the social community and the budget, i.e. the ability to pay (Araujo, 2019). Croatia used to have fewer doctors and nurses than many other EU countries, the ratio of doctors and nurses in relation to the number of inhabitants has gradually increased despite fears about the consequences of Croatia's accession to the EU in 2013 and the potential emigration of health professionals. The Ministry of Health has a management role in the health system and is the main regulatory body responsible for the development, planning, and evaluation of health policy. Many public health programs have been launched, regulatory standards have been set, and opportunities for training health professionals are expanding. The profession is regulated by the Act on Nursing NN 121/03. and 117/08. The National Health Development Plan for the period from 2021 to 2027 aims to establish a human resources management system. Numerous measures are being taken to improve the recruitment and retention of health personnel. According to the methodology, health workers include doctors of medicine, nurses, doctors of dental medicine, masters of pharmacy, masters of medical biochemistry, speech therapists, midwives, physiotherapists, bachelors of physiotherapy, massage therapists, health-laboratory technicians, bachelors of medical-laboratory diagnostics, medical technologists, biotechnologists and biomedical engineers, healthcare biologists, clinical psychologists, medical physicists, phoneticians and nutritionists if they perform healthcare activities in the process of diagnosis and treatment. The efforts are to work on changes in the education of middle and senior health personnel, i.e. nurses and technicians, and thus bring them to a higher professional level that accompanies such educational components. Through its professional associations, it works to promote and strengthen the reputation of the profession. In recent times, the possibility of nurses taking over some of the duties that are now performed by doctors, which is the practice in the health systems of many countries, has been mentioned more and more often as a way to solve the problem of the lack of qualified health professionals. The statistics support the fact that there are more and more employees in this sector and that they are more and more educated. The United Kingdom allows nurses to prescribe drugs and make home visits, in Sweden they medically manage patients' chronic conditions and administer vaccinations, and pharmacists prescribe drugs for certain conditions, the Netherlands, Ireland, and Spain allow nurses to perform certain medical procedures (Jaric Dauenhauer, 2023). Nursing as a profession is in the process of proving itself professionally and seeking greater reputation and autonomy compared to doctors, as well as recognition of its unique role in patient health care (Vuletic, 2013). The problem is that first-degree nursing education is almost not recognized, while no law has been passed for master's degrees in nursing and graduate nurses to perform the position itself in accordance with the level of education, and accordingly it is necessary to harmonize the workload coefficients of the workplace. Dissatisfaction with working conditions, and mismatch of coefficients and benefits as a result cause migration of health workers in search of better opportunities in other countries.

2. PERSONNEL WITH HIGHER AND SECONDARY EDUCATION IN THE FIELD OF HEALTHCARE

The development of the branch of nursing and related branches is continuously encouraged in such a way as to increase enrollment quotas and open up opportunities for the training of nurses, faculties for health studies, and health colleges, which provide various opportunities for education, training, and advancement. Recently, we also have the first doctors of science from the ranks of nurses and technicians. The results of research with 5 Zagreb universities that organize

and implement programs for the education of people over the age of 18 showed that the number of requalifications in healthcare professions has also increased (Koturic-Cabraja, 2020). The first faculty for the education of non-medical health personnel was the Faculty of Health Studies in Rijeka, founded in 2014. In addition to nurses and technicians, it also educates physiotherapists, radiology technicians, and midwives in undergraduate studies (Caleta, 2021). The study of nursing enjoys great popularity in Croatia. It is one of the most sought-after studies in the health profession, in which interest is increasing every year. Table 1 shows the list of nursing study programs according to holders and contractors.

Table 1. List of nursing study programs according to providers and contractors

Name of the study	Program holder	Performer
Nursing	Josip Juraj Strossmayer University in Osijek	Faculty of Dental Medicine and Health Osijek
Nursing	University of Split	University Department of Health Studies
Nursing	University of Zagreb	Faculty of Medicine
Nursing	University of Health in Zagreb	University of Health in Zagreb
Nursing	University of Zadar	University of Zadar
Nursing	Croatian Catholic University	Croatian Catholic University
Nursing	Juraj Dobrila University in Pula	Juraj Dobrila University in Pula
Nursing Nursing - Promotion and protection of mental health Nursing - management in nursing	University of Rijeka	Faculty of Health Studies
Nursing	University of Dubrovnik	University of Dubrovnik
Nursing Nursing - management in nursing	University of the North	University of the North
Nursing	Polytechnic in Bjelovar	Polytechnic in Bjelovar
Nursing	Ivanić-Grad College	Ivanić-Grad College

Source: Author's analysis from data from MOZVAG (2023)

According to statistical indicators, the number of employees in health care and social care, which are activities dominated by middle and senior health workers, is continuously increasing. From 2015/16 the number of persons employed in health care and social welfare activities was 103,211, while in 2020/21 amounted to 117,146, which is shown in Table 2.

Table 2. Persons employed in health care and social welfare activities 2015/2021.

Year	Total	Legal entities	Trade and liberal professions
2020./21.	117 146	104 886	12 260
2019./20.	113 821	101 622	12 199
2018./19.	111 776	99 714	12 062
2017./18.	100 838	88 819	12 019
2016./17.	99 151	87 017	12 134
2015./16.	103 211	91 277	11 934

Source: Author's analysis of data from the *Statistic Yearbook of the HZZ* (2015, 2016, 2017, 2018, 2019, 2020, 2021)

The number of unemployed in the same activities is falling, and in 2021 there were half as many people in health care and social welfare activities on the labor market than in 2014, which is shown in tables 3 and 4.

Table 3. Unemployed persons in health care and social welfare activities 2014/2021.

Year	2021.	2020.	2019.	2018.	2017.	2016.	2015.	2014.
Total	4 544	4 679	3 548	4 295	5 624	6 743	7 313	8 452

Source: Author's analysis of data from the [Statistic Yearbook of the HZZ](#) (2015, 2016, 2017, 2018, 2019, 2020, 2021)

Table 4. Number of unemployed by age and profession, nurse and technician by years 2014/2021

Year/Age	2014.	2015.	2016.	2017.	2018.	2019.	2020.	2021.
15-19	173	446	376	287	228	154	142	1
20-24	1759	1711	1218	908	751	522	417	21
25-29	466	378	317	242	220	177	141	12
30-34	297	270	217	155	113	94	75	5
35-39	107	127	112	96	86	74	87	8
40-44	77	56	43	43	36	30	46	4
45-49	88	62	41	46	34	22	22	1
50-54	77	62	59	53	39	22	31	2
55-59	24	30	31	34	33	32	19	6
60 and more	3	2	2	3	5	4	7	-
Total	3071	3144	2416	1867	1545	1131	987	60

Source: [Croatian Employment Service \(2021\)](#)

The number of registered unemployed places from the records of the Institute in 2014, when there were 16,886, in 2021, it has increased many times and amounted to 26,018 (Table 5).

Table 5. Reported vacancies and employment from the records of the Institute in the field of health care and social welfare in 2014/21.

Year	Registered vacancies	Employees from the Institute's records
2021.	26 018	9 290
2020.	19 612	8 119
2019.	23 810	7496
2018.	22 226	8800
2017.	20 596	7467
2016.	21 164	8 852
2015.	22 378	9 493
2014.	16 886	7 850

Source: Author's analysis of data from the [Statistic Yearbook of the HZZ](#) (2015, 2016, 2017, 2018, 2019, 2020, 2021)

According to the statistical indicators of the employment rate according to the occupations of employees in health care and social care at the level of secondary education, the profession of nurse/technician, and at the level of high or higher education, the profession of nursing, a high employment rate has been recorded in recent years, which is shown in tables 6 and 7.

Table 6. Employment rate by occupation at the level of secondary education - occupation nurse/ technician and other related occupations 2016/2021.

Interest	2021.	2020.	2019.	2018.	2017.	2016.
Nurse	76,5%	73,7%	68,0%	64,7%	135%	134,9%
Dental technician	60,9%	51,4%	49,2%	-	-	-
Pharmacy technician	59,3%	48,2%	-	49,8%	-	-
Health laboratory technician	58,5%	51,8%	46,5%	50,6%	-	50,7%

Source: Author's analysis of data from the [Statistic Yearbook of the HZZ \(2017, 2018, 2019, 2020, 2021\)](#)

Table 7. Employment rate by occupation at the level of high or higher education - occupation nursing and other related occupations 2016/2021.

Interest	2021.	2020.	2019.	2018.	2017.	2016.
Nurse	83,8%	75,2%	61,4%	63,0%	204%	121,8%
Radiological technology	75,0%			59,6%		
Medical and laboratory diagnostics	71,2%			57,9%		

Source: Author's analysis of data from the [Statistic Yearbook of the HZZ \(2017, 2018, 2019, 2020, 2021\)](#)

The average monthly net salary in health care and social welfare activities in 2020 was 1,086.00 euros, while in 2021 it was 1,167.00 euros. In health care activities, it is much higher than in social care activities in accommodation. Women are also underpaid in this industry more than men, and her average net salary in 2021 was 1,095.00 euros, while his average net salary was 1,403.00 euros.

Table 8. Average monthly net salary in health care and social welfare activities 2020/21 (in euros)

	2020			2021		
	Total	Men	Woman	Total	Men	Woman
Health care and social welfare activities	1 086	1 300	1 020	1 167	1 403	1 095
Health care activities	1 169	1 384	1 095	1 267	1 501	1 186
Social welfare activities with accommodation	789	850	778	821	876	811

Source: Author's analysis from data from [DZS - Statistics in series, Employment and Wages \(2023\)](#)

The number of hospital beds in Croatia only recently decreased in 2019 to 5.7 beds per 1,000 inhabitants, while in 2000 there were 6.0. A greater decrease in the number of hospital beds per capita was recorded in the entire EU, from 6.2 in 2004 to 5.3 in 2019. In Croatia, the decrease in the number of beds indicates further opportunities to relocate services from hospitals and is not accompanied by a reduction in jobs. (Review of the state of health and health care, 2021). The number of days and cases of hospital treatment by year is decreasing (Table 9). The number of health-care institutions is increasing slightly, which is accompanied by an increase in the number of new jobs in the healthcare system. Table 10 shows the number of health institutions by year.

Table 9. Number of days and cases of hospital treatment by the year 2017/2021.

Year	2017.	2018.	2019.	2020.	2021.
Days of hospital treatment	5 768	5 616	5 534	4 428	4 656
Hospital treatment cases	659	650	649	518	553

Source: Analysis by authors from [Croatia in numbers \(2022\)](#)

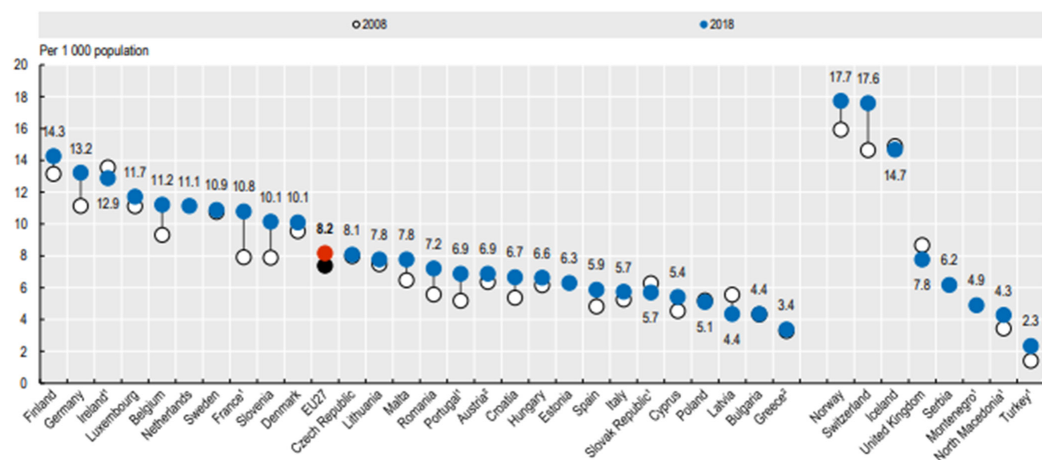
Table 10. Number of healthcare institutions by year 2013/2021.

Health institution	2013.	2014.	2015.	2016.	2017.	2018.	2019.	2020.	2021.
Institutes of public health	22	22	22	22	22	22	22	22	22
General hospitals	22	20	20	20	22	22	22	22	22
Clinics	5	5	5	5	5	5	5	3	6
Special hospitals	34	33	32	33	32	33	34	34	35
Health centers	49	49	49	49	49	49	49	44	44
Pharmacies	187	181	177	178	180	183	186	189	184
Polyclinics	360	350	357	356	353	355	358	330	321
Nursing care institution	199	198	206	214	220	278	280	225	141
Institutions of occupational medicine	9	9	9	8	7	7	6	5	4
Emergency care medicine	21	21	21	21	21	21	21	21	21

Source: Author’s analysis of data from the [Croatian Health Statistical Yearbook \(2017, 2018, 2019, 2020, 2021, 2022\)](#)

3. NURSING IN THE EUROPEAN UNION

In the EU, the number of nurses per 1,000 inhabitants in 2018 was the highest in Finland, Germany, and Ireland, while Bulgaria and Greece had the lowest number. Between 2008 and 2018, the total number of nurses per capita increased constantly in most EU countries, except in Latvia, the Slovak Republic, and Ireland where it decreased, while the number increased significantly in Norway and Switzerland. In Norway, with the Competence Lift 2020 action plan adopted in 2016, the Government adopted a series of measures to encourage and recruit medical students into education programs and to improve working conditions. This action plan will be extended for another five years according to Competence Lift 2025 ([Health at a Glance: Europe, 2020](#)). Graph 1 shows the number of nurses per 1,000 inhabitants in European countries in the period from 2008 to 2018.



Graph 1. Nurses per 1,000 inhabitants in the EU, 2008 and 2018.

Source: [Health at a Glance: Europe \(2020\)](#)

Figure 1 illustrates the number of nurses and doctors per 1,000 inhabitants. Countries with a small number of doctors and a large number of nurses per 1000 inhabitants are Finland, Ireland, France, the Netherlands, Belgium, Luxembourg, and Slovenia. Countries with a small number of doctors

and nurses per 1000 inhabitants are Croatia, Hungary, Romania, Poland, Slovakia, and Estonia. Countries with a large number of doctors and a small number of nurses per 1000 inhabitants are Bulgaria, Italy, Spain, Portugal, Estonia, Lithuania, Cyprus, and Malta. Countries with a large number of doctors and nurses per 1000 inhabitants are Norway, Germany, Austria, Denmark, Sweden, the Czech Republic (marginal) Iceland (marginal).

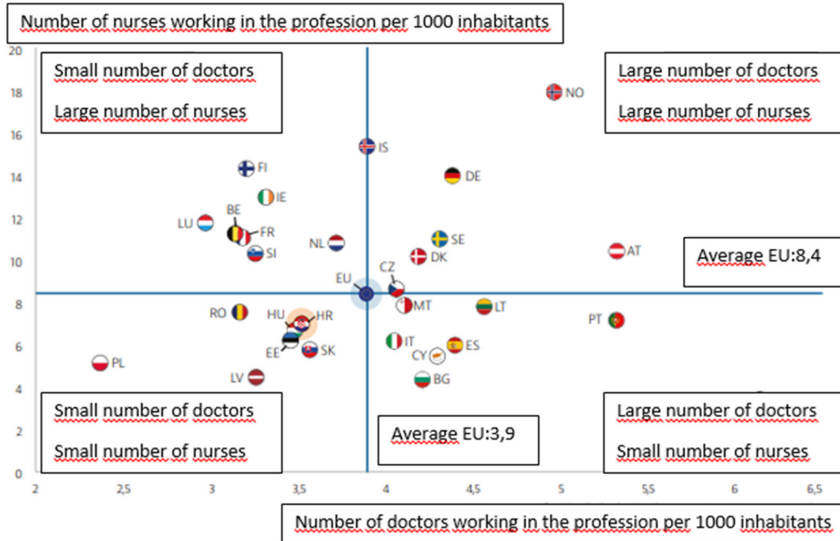
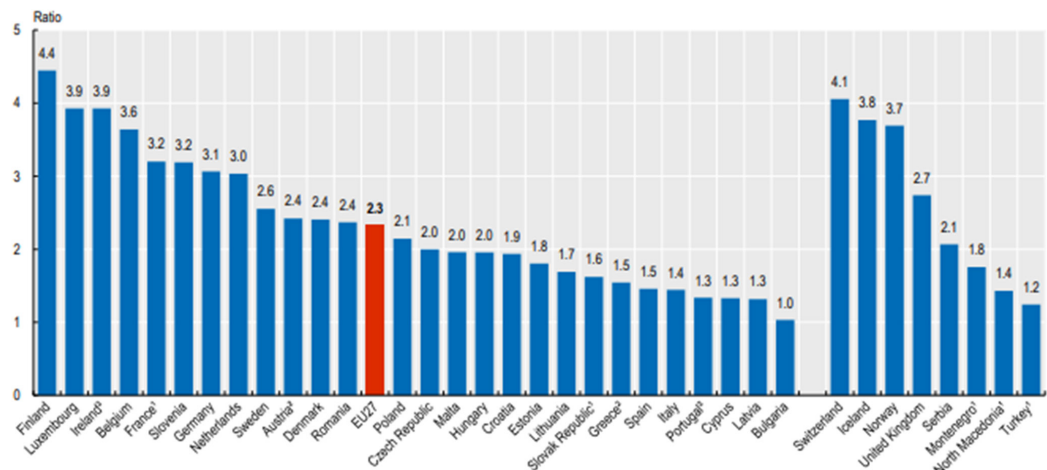


Figure 1. Number of doctors and nurses per 1,000 inhabitants in the EU, 2019.

Source: Eurostat (2019)

The number of nurses greatly exceeds the number of doctors in most EU countries. In 2018, in most EU countries there were on average two nurses for one doctor, while in Finland, Luxembourg, and Ireland the ratio of the number of nurses to doctors is around four or more. The lowest ratio is in Bulgaria, where there is one nurse for every doctor. The graph shows the ratio of nurses to doctors in 2018 in Europe.



Graph 2. The ratio of nurses to doctors, 2018

Source: Health at a Glance: Europe (2020)

4. NURSING IN CROATIA

In Croatia, the entire health system lacks the number of health workers according to statistical data when viewed proportionally to the total population. The criterion for determining the shortage of nurses is based on a comparison of the actual number of nurses in each individual hospital and their number predicted by the systematization of workplaces. The shortage of nurses in some hospitals was alarming even before the outbreak of the COVID-19 pandemic, which was canceled during the pandemic when the staff of other hospitals filled this shortage. Statistically speaking, the number of employees in the healthcare system is continuously growing, and nurses and technicians are the backbone of the healthcare system. According to current data published by the Croatian Institute of Public Health, the most numerous group is in healthcare. In 2019, their number was 31,555, which is 43.5% of the total number of employed workers (Caleta, 2021). In 2018, 41,332 nurses and medical technicians were licensed, of which 26% have bachelor's degrees in nursing with a university or professional degree, 4% have completed professional or university graduate studies and post-graduate (doctoral) studies, making up more than 40% of the total number of health workers (Sestrinska Proclamation of the Republic of Croatia, 2020). There are 2,763 nurses with a university degree employed in Croatia, and 30% of them work in outpatient, emergency, intensive care, or operating units (Hina, 2023). In Croatia, the number of senior nurses per 100,000 was recorded at 166.5, and the number of midwives in Croatia was 40 per 100,000 in 2018 (Eurostat, 2019). Hospitals lack 4,500 nurses, which means that they are working 22% less than the required number. The "Dr. Fran Mihaljevic" hospital is missing 270 nurses, which means that almost half of the nurses are missing in that hospital. Before the outbreak of the epidemic, 80 nurses were missing in Dubrava Hospital, and in 2020, about 50 of them left. In the hospital in Knin, 30 nurses are missing, and 30% of the nurses are working less than the number foreseen by the systematization (Lukic, 2020).

At the end of 2021, a total of 75,186 health workers and associates were employed in the healthcare system of the Republic of Croatia, while in 2020 there were 72,929 of them. In the structure of the total number of employed healthcare workers and associates, observed by years 2016-2021. the largest share is those with a medium level of professional education, followed by the share of those with a high level of professional education, then with higher education, and the smallest number of employees with a lower level of professional education, which is shown in Table 11.

Table 11. Total number of health workers with high, higher, intermediate, and lower levels of professional education in the health system in 2016/2021.

Degree of professional education	Total					
	2016	2017	2018	2019	2020	2021
University degree	1 695	1 782	1 873	2 020	2 127	2 346
Junior college	11 546	12 167	13 210	13 805	14 169	15 553
High school	33 365	33 563	33 538	33 424	33 150	33 278
Semi-skilled	431	457	646	680	699	722

Source: Author's analysis from the *Croatian Health Statistical Yearbook* (2017, 2018, 2019, 2020, 2021, 2022)

Nurses and technicians, the most numerous group in healthcare, are divided into those with completed high, higher, and secondary education, and those with secondary vocational education dominate, which is shown in Table 12.

Table 12. Total number of nurses and technicians in 2016/2021.

Year	University degree	Junior college	High school
2016.	265	6 419	25 567
2017.	245	6 789	25 505
2018.	380	7 410	25 132
2019.	325	8 017	24 989
2020.	373	8 554	24 774
2021.	436	9 230	24 470

Source: Author's analysis from the [Croatian Health Statistical Yearbook \(2017, 2018, 2019, 2020, 2021, 2022\)](#)

Table 13 shows the number of health workers with high, higher, secondary, and lower levels of professional education in the health system broken down by profession in 2021. year. According to the Chamber of Nurses, there are currently 13 nurses who have completed doctoral studies (personal communication, March 29, 2023). In the group of nurses-technicians, 13.6% are men ([Croatian Health Statistical Yearbook, 2021](#)). Among the total number of employees, the number of health workers increased by 2,624, and non-health workers decreased by 47, so the shares are 77% of health workers (57,930) and 23% (16,343) of non-health workers. In 2021, compared to 2020, the number of employees increased by 2,577 employees, of which 512 are nurses and 1,721 are other health and non-health workers. In 2020, the number of employees increased compared to 2019 by 1,174, of which 267 were nurses and 422 other employees. In 2019, compared to 2018, 2,781 people were newly employed in the healthcare system, of which 909 were nurses and 1,418 other employees.

Table 13. Number of healthcare workers with high, higher, secondary, and lower levels of professional education in the healthcare system by profession in 2021.

Occupation	Level of education	Total	Male	Female
Nurse technician	University degree	436	53	383
Nurse technician	Junior college	9 230	974	8 256
Nurse technician	High school	24 472	3 378	21 094
Bachelor of nursing	Junior college	8 972	972	800
Bachelor of midwifery	Junior college	258	2	256
Midwifery course	High school	1 404	3	1 401
Midwifery assistant	High school	93	-	93
General direction	High school	22 975	3 375	19 600
Bachelor's degree in dental hygiene	Junior college	3	2	1
Dental assistant	High school	838	25	813
Bachelor's degree in medical laboratory diagnostics	Junior college	1 432	133	1 299
Bachelor's degree in physiotherapist		2 707	662	2 045
Physiotherapy technician	High school	1 171	289	882
Bath massager	High school	24	4	20
Bachelor's degree in radiological technology	Junior college	1 582	776	806
Radiology technician	High school	11	3	8
Pharmaceutical engineer	Junior college	2	0	2
Pharmacy technician	High school	3 012	177	2 835
Dental technician	Junior college	48	16	32
Dental technician	High school	1 177	378	799
Bachelor's degree work therapy technician	Junior college	232	26	206
Orderly	Semi-skilled	224	34	190
Hygienist	Semi-skilled	1	1	-
Dental assistant	Semi-skilled	3	-	3
Massager	Semi-skilled	3	1	2

Source: [Croatian Health Statistical Yearbook \(2017, 2018, 2019, 2020, 2021, 2022\)](#)

This trend also followed expenses for salaries, which increased by more than 40% from 2016 to 2021, by 24% in the last four years, and last year the base increased by an additional 4% (Kovacic Barisic, 2022). Table 14 shows the base salary for the position of nurse, where it is clear that the base is continuously increasing over the years.

Table 14. The basis for salary calculation for the position of nurse by years (in kuna)

Year	Basic salary year
2006.	4 546,85 kn
2007.	4 819,66 kn
2008.	5 108,84 kn
2009.	5 415,37 kn
2010.	5 108,84 kn
2016.	5 211,02 kn
2017.	5 315,24 kn
1.12.2017.	5 421,54 kn
2019.	5 584,18 kn
1.9.2019.	5 694,87 kn
2020.	5 809,79 kn
2021.	6 044,51 kn
1.5.2022.	6 286,29 kn
1.10.2022.	6 663,47 kn

Source: Salary calculation taken from the Chamber of Nurses (2023b)

Health workers are divided into education groups high, middle, and lower. The intermediate levels include dental technicians, pharmaceutical technicians, radiological technicians, massage therapists, physiotherapist technicians, sanitary technicians, laboratory technicians, dental assistants, midwives, and nurses. The lower ones include masseurs, dental assistants, hygienists, paramedics, and childcare providers. The number of healthcare workers with higher and secondary education, referring to nurses and technicians by age, is shown in the table below.

Table 15 shows the total number of hospitals and beds according to institutions: general hospital, clinical hospital center, clinical hospital, spas, general/family medicine, emergency medicine, women's health care, protection of infants, toddlers, and preschool children, protection and treatment of teeth, occupational medicine.

Table 15. Number of health workers with non-university college degrees and secondary school education by year and number of beds by year in total

Year	Hospitals	Beds	Health workers with non-university college degrees and secondary school education
2008.	80	24 282	15 306
2009.	79	13 967	15 341
2010.	71	25 017	17 154
2011.	70	25 671	18 202
2012.	79	25 285	17 827
2013.	81	25 119	17 469
2014.	77	25 219	17 284
2015.	75	23 583	18 095
2016.	75	23 088	18 895
2017.	75	23 049	19 058

Source: Author's analysis from statistical data of the Croatian Institute of Public Health (2016, 2017)

5. MIGRATION FACTORS OF NURSES AND TECHNICIANS

“Medical carousel” is a term that refers to the migration of health professionals to countries that offer better salaries and training opportunities, the poorest countries thus losing their workforce. The loss of nurses represents efforts and obstacles in the quality of providing basic health and public health services. The main observed problems of nurses and technicians are inadequate working conditions, overload with work, bureaucratic and administrative problems, limited possibility of advancement in work, low income compared to other occupations, lack of motivation of health workers, and fixed-term contracts (Juric, 2020a). Due to dissatisfaction with their work status and working conditions, as well as overwork and underpayment, increased migration is recorded. From 2009 to 2013, according to the data of the Croatian Employment Service, 4,279 nurses emigrated (Croatian Employment Service, 2013). 1438 certificates for work abroad were issued. In the period from the entry into the EU in 2013 to 2017, 1,829 of them left. The age range is between 25 and 45 years of age (Ljubic, 2019). In 2017, the largest number emigrated to Ireland, 99 of them, and in 2016, 33 of them emigrated to Great Britain (Svetic Ciscic, 2021). The number of those who left directly after completing their education is not known. It is estimated that the healthcare system lacks about 30% of nursing staff trained at the higher education level (Modrusan, 2022). According to the German Economic Institute in Cologne, there will be a shortage of more than 300,000 nurses for hospital care in that country by 2035 (Juric, 2020b). Table 16 shows a report on requests issued for certificates for work abroad by year, a total of 3,072 were issued until December 31, 2022.

Table 16. Number of requests issued for the departure of nurses and technicians to work abroad by the year 2013/2022.

Year	Issued request
2013.	49
2014.	339
2015.	529
2016.	491
2017.	359
2018.	336
2019.	282
2020.	236
2021.	236
2022.	215
Total	3 072

Source: Press release from the Chamber of Nurses (2023a)

The new Law on Foreigners, which entered into force on January 1, 2021, prescribes a model for the employment of third-country nationals, and annual quotas of employment permits in the Republic of Croatia will no longer be determined. Employers will contact the Croatian Employment Service to find a workforce, which will conduct a labor market test. Annual quota for foreign workers nurses and technicians on 18.12.2020. from the health sector, it was 25 and for nurses and technicians from the social welfare sector, it was 55 (data from the website of the Ministry of the Interior, Statistics). Table 17 shows the number of members of the Chamber of Nurses by country of education as of December 31, 2022. since statistics are not kept according to citizenship. In order to obtain a work license, it is necessary to go through the process of recognition of foreign professional qualifications and to obtain a self-employment permit for the profession of nurse.

Table 17. Number of members of the Chamber of Nurses by country of education as of 12/31/2022. years

Country	Number of members of the chamber on nurses
Bosnia and Herzegovina	350
Slovenia	49
Serbia	39
Germany	15
North Macedonia	7
Czech Republic	5
Ukraine	5
Netherlands	2
Slovakia	2
Hungary	2
Austria	1
Kosovo	1
Lithuania	1

Source: Press release from the [Chamber of Nurses \(2023b\)](#)

Various models have been proposed as possible solutions to this problem ([Jaric Dauenhauer, 2023](#)):

- that bachelor's degree nurses increase their authority to perform certain medical tasks by training in a one-year specialization;
- that graduate nurses (master's degrees) receive greater powers;
- to enable additional specialization for master's and graduate nurses.

It is necessary to integrate the new advanced nursing roles into the routine provision of nursing care and include them in regular evaluations. Four different trends have been defined in the development of the new role of nurses and the direction of reforms ([Svetic Ciscic, 2021](#)):

- developing the specific role of nurses;
- introduction of new profiles of caregivers whose focus is the treatment of chronic conditions;
- increase in educational programs with specific skills and competencies;
- the adoption of new laws and regulations, the trend started in 2010 when certain categories of nurses were given a license to prescribe therapy.

Through professional associations, they act together in their positions with the aim of improving the profession by advocating reforms. Associations for the promotion of the rights of nurses demand measures from the Government to improve working conditions and status in the Proclamation ([Sestrinska Proclamation of the Republic of Croatia, 2020](#)):

- Recognition of higher vocational education by amending the Regulation on job titles and job complexity coefficients in public services;
- Planning measures to solve the personnel deficit in nursing;
- Accession to amendments to the Law on Nursing;
- Preparation of the document Projection of personnel needs in Croatian nursing 2020-2025. based on the planning of the needs for the education of nurses at the level of health institutions;
- Adopting the Strategy for the Development of Nursing in the Republic of Croatia in 2030 in cooperation with all relevant nursing institutions in the Republic of Croatia;
- Harmonization of the systematization of workplaces in healthcare institutions with the current Ordinance;
- Defining the right of nurses to benefited working experience.

Ljubic (2019) conducted research in which a total of 150 participants took part, of which 112 women and 38 men are nurses and technicians, 96% of them with high school education, 46% of them with undergraduate vocational education, and 8% with graduate studies. 44.7% rated their satisfaction with their previous work in Croatia as bad 16.7% rated it as very bad, while 48.7% rated their satisfaction with their work abroad as excellent and 45.3% rated it as good. Regarding the reasons for their migration to other countries, 67.1% fully agreed that they left for better working conditions, 64% fully agreed that they left the Republic of Croatia for better income, 52.7% fully agreed that left because of insufficient professional training and advancement at work, 47.3% fully agree that they left because of poor work organization. 78.5% fully agree that they were not paid nearly enough for the work they performed, 88% also think that nurses and technicians are overworked in the Republic of Croatia, and 84.7% believe that nurses and technicians are not valued enough in the Republic of Croatia. 86% declared that they are not thinking about returning to Croatia permanently.

In the second survey conducted by Ceglec (2021), 226 participants took part - all nurses/technicians. The countries of work and residence of the research participants are the Republic of Croatia (48.67%), the Republic of Slovenia (10.62%), and the Federation of Bosnia and Herzegovina (40.71%), of which 190 women and 36 men, 39% of them with secondary education by education, 33% of them with undergraduate professional studies, 23% with graduate studies and 3 of them with doctoral studies. 31% of them have less than 5 years of work experience, 31% of respondents are 26-35 years old and 29% of them are 36-45 years old. Among the reasons for leaving, 50.44% of them cite better working conditions and wages; 44.69% of them have greater opportunities for advancement and improvement. 62.83% of respondents declare that nurses and technicians are not valued enough in the health system of their home country. 64.60% declared that nurses and technicians do tasks that are not in their job description, administrative tasks. 68.60% believe that they should have a beneficial working experience.

According to research, nurses and technicians are potential migrants in the age group of 25 to 45 years with less than 5 years of work experience and high school education. What is highlighted in all the research is that job satisfaction, best practice, and retention are key to a healthy work environment. Satisfying the specifics of the health labor market and the challenges in the education and training of nurses and technicians for dignified work and safety is the ultimate goal. Integration, synthesis of policy and organization, and joint interventions are crucial for implementing changes, removing obstacles in practice, meeting local needs, and defining the necessary combinations of knowledge and skills (Maier, 2017).

6. CONCLUSION

The health workforce is based on the needs of society. In it, the most numerous are those with higher and secondary health education. These are active staff in clinical events and are fully equal and involved members in the treatment process. This occupation represents a challenge because it requires continuous improvement and advancement in the development of a professional career, and all professions within the health system must be planned and developed through the prism of the needs of the social community. The constantly growing number of employees in healthcare and the opening of new jobs in that sector are noted, there are numerous opportunities for education and the acquisition of additional competencies, which resulted in the strengthening of the capacity of the profession. The migration of nurses and technicians will slow down and further complicate the development and raising of the quality and standards of the healthcare system. The role and importance of nurses and technicians are unquestionable because they dominate the human potential in health

care, which in the future will assume increasing responsibilities according to the level of education. Today's situation is a reflection of failed planning strategies in the past period, while today's trend is the reduction and stagnation of hospital capacity growth (reduction in the number of beds and duration of hospitalizations, the same or smaller number of institutions providing health services) and an increase in the number of health personnel and educational institutions that each in 2018, they project a new workforce, which will affect the supply and demand relationship, i.e. the competitiveness of jobs. Therefore, it is necessary to manage personnel in health care based on strategic goals that have emerged founded on the detection of the current state of health care and the perception of what is desired in the future. That is why it is necessary to continuously invest in lifelong education and to focus more on professional development for the natural sake of the job itself, and the investment will be returned many times over. The products of the development strategies have made it possible for the offer of jobs to be satisfactory, wages are continuously growing, as well as educational opportunities, but migration is still ubiquitous and slows down the further development of the profession. The most expensive nurse is the one who doesn't have one!

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