

# Nursing in North Macedonia – Opportunities and challenges

## Sestrinstvo u Sjevernoj Makedoniji – mogućnosti i izazovi

Natalija Dechovski<sup>1</sup>, Valentina Gorichaneč<sup>1</sup>

<sup>1</sup>International Balkan University-Skopje, Makedonsko-Kosovska Brigada bb 1000, Skopje/North Macedonia

### Abstract

**Introduction:** Nursing in North Macedonia has a long tradition. Over the years, depending on the social conditions, nursing in North Macedonia developed using the opportunities and faced all the challenges.

**Aim:** This study aimed to review and analyze the socioeconomic characteristics of the population, as well as nursing in terms of education level, staff, and career development to determine the needs of nursing care and recognize the opportunities and challenges of nurses.

**Methods:** An analytical study was conducted by analyzing statistical publications of the State Statistics Office and the Institute of Public Health of the North Macedonia, and other relevant publications related to nursing in the period from 2012 to 2022.

**Results:** In the study, an analysis of the population was made based on vital and socioeconomic characteristics, and nursing based on education, staff, and employment. An increase in the number of residents in 2022, in contrast to 2013, is recorded for 599 more residents per patronage nurse and 1035 residents per health professionals with higher education. In 2021, 34.5% of the total number of health professionals were nurses; the largest percentage, 80.4% had completed secondary education, 17% completed university, and 2.6% had higher education. The ratio of nurses to one doctor in North Macedonia was 1.4 nurses to one doctor, which is 0.9 less than the European average, and 4.3 nurse practitioners per 1000 inhabitants, which is far below the EU27 average of 8.2 nurses per 1000 inhabitants. A decrease in the number of health professionals was observed at the level of primary health care in the Health Centres for 86 health professionals, which is 4.5% of the employees in 2021, in contrast to 2012.

**Conclusion:** The aging of the population requires greater capacities for nursing care. Nurses should recognize the opportunities for the development of nursing, which will help them overcome challenges and build capacity in the direction of reforms in nursing in North Macedonia.

**Keywords:** nursing, opportunities, challenges, North Macedonia

**Short title:** Nursing in North Macedonia

### Sažetak

**Uvod:** Sestrinstvo u Sjevernoj Makedoniji ima dugu tradiciju. Tijekom godina, ovisno o društvenim prilikama, sestrinstvo u Sjevernoj Makedoniji razvijalo se koristeći sve mogućnosti i suočavajući se s popratnim izazovima.

**Cilj:** Cilj ovog istraživanja bio je sagledati i analizirati socioekonomske karakteristike stanovništva, kao i sestrinstva, s obzirom na razinu obrazovanja, osoblja i razvoja karijere kako bi se utvrdile potrebe sestrinske skrbi i prepoznale mogućnosti i izazovi medicinskih sestara.

**Metode:** Analitičko istraživanje provedeno je analizom statističkih publikacija Državnog zavoda za statistiku i Instituta za javno zdravstvo Sjeverne Makedonije, te drugih relevantnih publikacija vezanih za sestrinstvo u razdoblju od 2012. do 2022. godine.

**Rezultati:** Studija je analizirala populaciju na temelju vitalnih i socioekonomskih karakteristika te zdravstvene njege na temelju obrazovanja, kadrovske popunjenosti i zaposlenosti. Porast broja stanovnika u 2022. godini, za razliku od 2013. godine, bilježi se za 599 stanovnika više po jednoj patronažnoj sestri i 1035 stanovnika po jednom visokoobrazovanom zdravstvenom radniku. U 2021. godini 34,5 % od ukupnog broja zdravstvenih radnika bile su medicinske sestre; najveći postotak, 80,4 %, ima završenu srednju stručnu spremu, 17 % ima visoku i 2,6 % višu stručnu spremu. Omjer medicinskih sestara na jednog liječnika u Sjevernoj Makedoniji bio je 1,4 medicinske sestre na jednog liječnika, što je 0,9 manje od europskog prosjeka, a 4,3 medicinske sestre na 1000 stanovnika, što je daleko ispod prosjeka EU27 od 8,2 medicinske sestre na 1000 stanovnika. Uočeno je smanjenje broja zdravstvenih radnika na razini primarne zdravstvene zaštite u domovima zdravlja za 86 zdravstvenih djelatnika, što je 4,5 % zaposlenih u 2021. godini u odnosu na 2012. godinu.

**Zaključak:** Starenje stanovništva zahtijeva veće kapacitete za zdravstvenu njeгу. Medicinske sestre trebaju prepoznati mogućnosti za razvoj sestrinstva, čime će se prevladati izazovi i izgraditi kapaciteti u smjeru reformi sestrinstva u Sjevernoj Makedoniji.

**Ključne riječi:** sestrinstvo, mogućnosti, izazovi, Sjeverna Makedonija

**Kratak naslov:** Sestrinstvo u Sjevernoj Makedoniji

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**Autor za korespondenciju/Corresponding author:** Asst. prof. dr. Natalija Dechovski, International Balkan University-Skopje, Makedonsko-Kosovska Brigada bb 1000, Skopje/North Macedonia, Mob: +38977533030, e-mail: n\_decovski@yahoo.com

### Introduction

Nursing in North Macedonia has a long tradition. The first trained nurse, Slavjanka Vlahcheva, laid the foundations of Macedonian nursing in 1924. In 1921, she enrolled in the school for nursing sisters in Belgrade, led by the English

woman Miss Newton. After completing her education, she returned to her native Shtip, where she began working in the health institution.

After the liberation, she participated in the opening of the first school for nurses and, as a director, participated in the education of the first post-war generation of nurses [1, 2]. Furthermore, over the years, depending on the social conditions, nursing in North Macedonia developed using the opportunities and facing all the challenges.

Aims of study

This study aimed to provide an overview and analysis of the vital health indicators and socioeconomic characteristics of the population in order to determine the needs of nursing care and give recommendations for improving the health of the population.

This study also aimed to provide an overview and analysis of nursing in North Macedonia in terms of the level of education, staff, and career building in order to recognize the opportunities and challenges of nurses and to give recommendations for the advancement of the nursing profession.

Methods

As a methodology, an analysis of the latest published data of the State Statistics Office of North Macedonia, Health Maps of the Institute of Public Health, and additional relevant published literature in the period from 2012 to 2021 was used.

Results and Discussion

Review and analysis of vital health indicators and socioeconomic characteristics of the population

According to the last population census of North Macedonia, the total population was 1,829,954, with a Gross Domestic Product per capita in 2022 of 6591 dollars. Current healthcare expenditures per capita amounted to \$782, with total healthcare expenditures as a % of GDP in 2020 amounting to 7.7% [3].

According to the State Statistics Office, the birth rate in 2022 was 9.9 newborns per 1,000 inhabitants, in contrast to 2013, when the rate was 11.4, which represents a downward trend of 1.5 newborns per 1,000 inhabitants. A decreasing trend can also be seen in the natural increase, which is negative in 2022 and amounted to -2.4 per 1000 inhabitants. The mortality rate shows an upward trend from 9.8 in 2013 to 12.3 in 2022. The infant mortality rate, perinatal and neonatal mortality rates are showing a decreasing trend [4, 5].

In 2022, there is a trend of decreasing the number of inhabitants to one doctor, dentist, pharmacist, and health worker with a secondary education. An increase in the number of inhabitants in 2022, in contrast to 2013, is recorded by 599 more inhabitants per patronage nurse and 1035 more residents per health professional with higher education [4, 5, 6].

According to population censuses, there is a decreasing trend in the population aged 0-49, while the population of older individuals aged over 55 is increasing. The greatest increase in the number of the population is recorded

Table 1. Vital indicators and trend 2013/2022

Vital indicators 2013/2022	Rate 2013	Rate 2022	Trend
Birth rate per 1000 inhabitants	11,4	9,9	↓
Mortality per 1000 inhabitants	9,8	12,3	↑
Natural increase per 1000 inhabitants	1,7	-2,4	↓
Infant mortality	7,8	3,2	↓
Perinatal mortality	12,8	9,2	↓
Neonatal mortality	7,9	1,4	↓

TABLE 2. Health indicators and trend 2013/2022

Health indicators – Number of inhabitants per one 2013/2022	Number of inhabitants 2013	Number of inhabitants 2022	Trend
Doctor	358	291	↓
Dentist	1248	1074	↓
Pharmacist	2321	1656	↓
Health professionals with high education	2691	3726	↑
Health professionals with secondary education	2691	144	↓
To one patronage nurse	5960	6559	↑
Hospital beds			
Total	9076	9169	↑
Hospital beds per 1000 inhabitants	4,4	5,1	↑

**TABLE 3.** Population according to age, by censuses

	1981	1991	2002	2021	Trend
TOTAL	1 909 136	2 033 964	2 022 547	1 836 713	↓
0-4	191 642	154 549	122 757	96 521	↓
5-9	184 854	167 433	143 184	109 318	↓
10-14	178 681	165 970	160 339	105 508	↓
15-19	178 205	160 859	165 422	104 035	↓
20-24	174 352	153 652	161 945	106 553	↓
25-29	165 074	156 511	153 461	116 145	↓
30-34	146 028	164 193	148 281	123 101	↓
35-39	113 784	163 189	149 837	127 381	↓
40-44	113 549	145 993	146 902	128 186	↓
45-49	111 127	111 975	142 688	126 444	↓
50-54	94 365	110 442	127 760	125 643	↑
55-59	76 438	109 764	95 234	127 752	↑
60-64	48 233	88 812	89 822	124 795	↑
65 and more	128 261	165 716	213 712	315 331	↑
UNKNOWN	4 543	14 906	1 203	-	↓

among people aged 60-64, from 38.6% in 2021, in contrast to 1981, and over 65 years of age, from a 40.7% increase in 2021 in contrast to 1981 [7, 8].

Thus, the percentage of elderly people in the total population according to the last census was 17.2%, which indicates that North Macedonia is facing the problem of an aging population. The percentage of elderly people according to the censuses starting in 1931 ranged from 6.2% in 1931, 5.3% in 1959 when it starts to increase to 6.7% in 1981, 8.1% in 1991, to note in 2002 the aging population trend of 10.6% [7].

According to the Regions, in 2021, the highest percentage of the population older than 65 years was observed in the Eastern Region of 21%. The Pelagonian and Southeastern regions with 19.7% and the Vardar region with 18.5% have a population older than 65 years above the national average. The Pologi region has the lowest percentage of elderly population at 13.0%. In general, in all regions, there is an

increase in the number of elderly people, which certainly affects the planning of health care and is a challenge for nursing in North Macedonia [9, 10].

Life expectancy shows a decreasing trend from 76.34 years in 2017 to 74.57 years in 2021 [8].

In terms of the most common causes of death, the largest share is those who died from cardiovascular diseases, which number increased from 19,718 in 2014 to 28,516 in 2021, which represents an increase of 69.1% [8, 11].

#### Review and analysis of nursing in North Macedonia in terms of education level, staff and career development

In 2021, the total number of employed nurses and health care assistants was 12,170, of which 78.5% were nurses with university, high and secondary vocational education, and 21.5% were health care assistants [8].

**TABLE 4.** Number and % of employed nurses and health care assistants in the total number of health care professionals with university, high, and secondary vocational education, 2021

	Number	%
Total health care professionals with university, high, and secondary vocational education	12,170	100
Nurses with university, high, and secondary vocational education	9,553	78.5
Health care assistants	2,617	21.5

**TABLE 5.** Number and % of nurses in the total number of health professionals, 2021

	Number	%
Total health care professionals	27 722	100
Total nurses with university, higher and secondary education	9 553	34,5

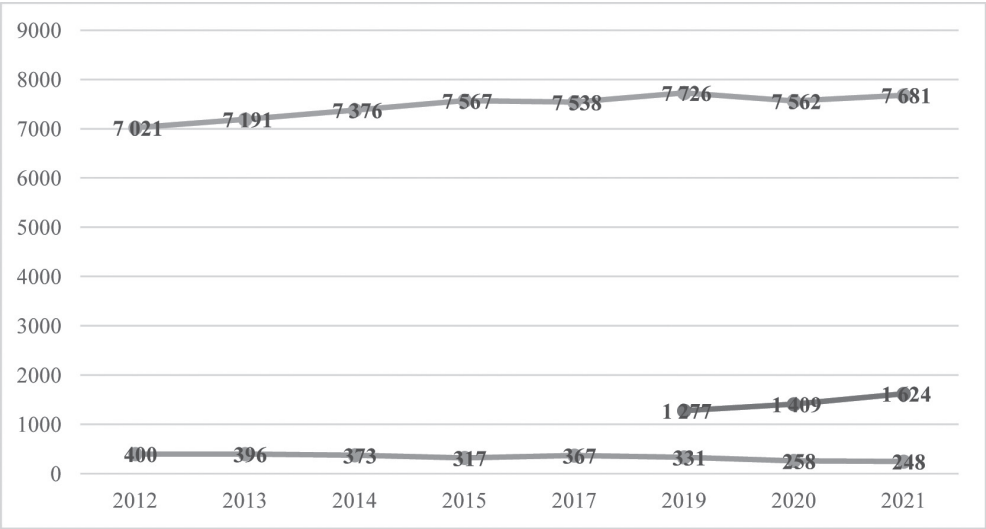
**TABLE 6.** Number and % of nurses by level of education, 2021

	Number	%
Total nurses with university, higher, and secondary education	9 553	100
Nurses with university level of education	1 624	17,0
Nurses with higher level of education	248	2,6
Nurses with secondary level of education	7 681	80,4

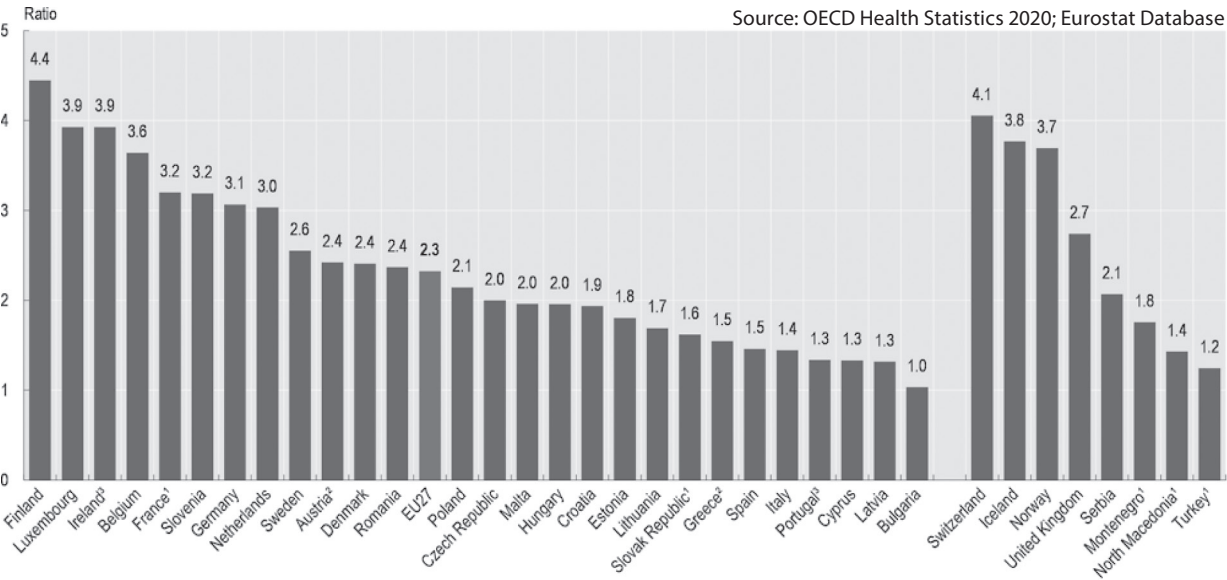
In 2021, 34.5% of the total number of health professionals were nurses [8].

According to education, the largest percentage of 80.4% were health care assistants with completed secondary education, 17% of nurses with university and 2.6% nurses with higher education [8].

According to education, the largest number is nurses with a secondary level of education, and this number ranged from 7,021 in 2012 to 7,681 in 2021. Data on nurses with a university-level education began to be recorded in 2019, and this number rose from 1,277 in 2019 to 1,624 in 2021 [8, 11-17].

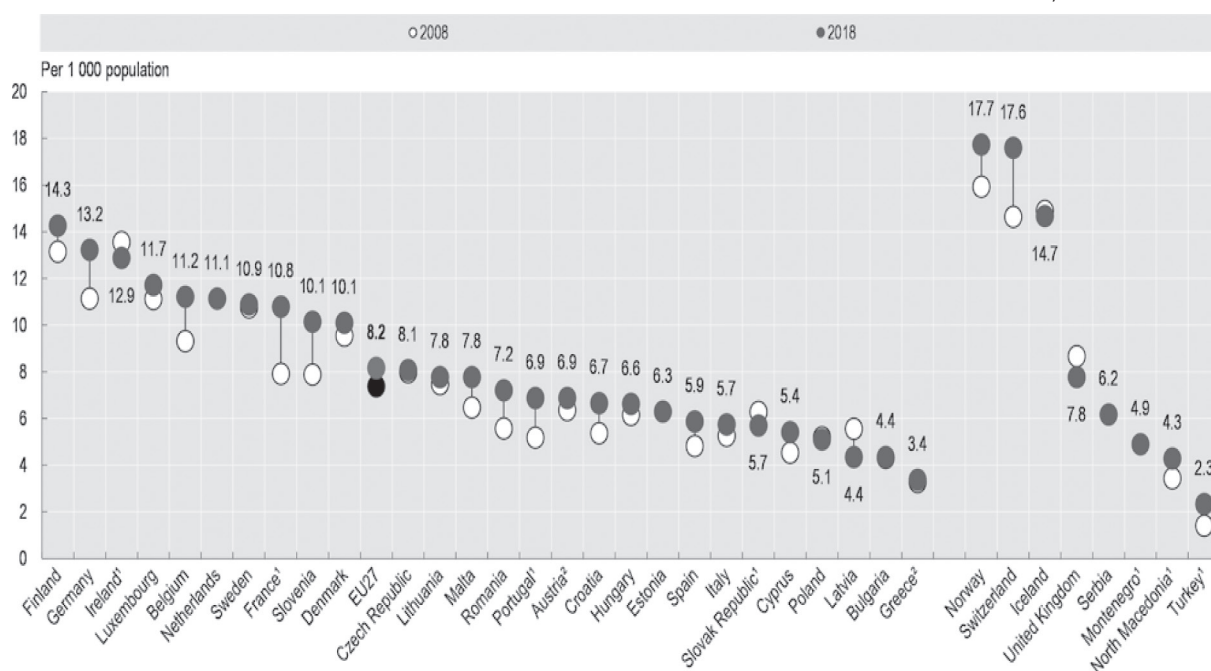


**CHART 1.** Nurses with university, higher, and secondary level of education 2012-2021



**CHART 2.** Ratio of nurses to one doctor

Source: OECD Health Statistics 2020; Eurostat Database

**CHART 3.** Nurse practitioners per 1000 inhabitants, 2008 and 2018

Regarding the ratio of nurses to one doctor in the Republic of Macedonia, that ratio was 1.4 nurses to one doctor, which is 0.9 less than the European average [18].

In 2018, North Macedonia had 4.3 nurse practitioners per 1000 inhabitants, which is far below the EU27 average of 8.2 nurses per 1000 inhabitants. Croatia had 6.6 nurses per

**TABLE 7.** Number of health professionals with secondary and higher level of education by job position, 2012-2021

Health workers with secondary and higher level of education by job position			
	2012	2021	Trend
1. Health stations	43	48	↑+5
2. Health centers	1997	1911	↓ -86
3. Private health facilities	4115	4648	↑+533
4. General hospitals	2027	2886	↑+859
5. Clinical hospitals	938	1051	↑+113
6. Private hospitals	604	1011	↑+407
7. University Clinic for Surgical Diseases, Skopje	154	178	↑+24
8. Special Hospital Chair	75	116	↑+37
9. Kozle Institute	79	113	↑+34
10. Centers for public health	236	279	↑+43
11. Institute of Public Health	30	59	↑+29
12. University clinics	1275	2008	↑+733
13. Dental clinics	137	136	↓ -1
14. Private health facility dental center Dr. Bojo Andrevski	11	8	↓-3
15. Institutes at the Faculty of Medicine	63	96	↑+33
16. Transfusion Institute of the Republic of Macedonia	158	264	↑+106
17. Special hospitals for chest diseases	48	60	↑+12
18. Special hospitals for mental diseases	358	345	↓-13
19. Treatment and rehabilitation centers	245	290	↑+45
20. Other special hospitals	215	287	↑+72
Total	12808	15794	↑+2986

1000 inhabitants, Serbia 6.2, and Montenegro 4.9, above the Macedonian rate. Only Turkey 2.3 and Greece 3.4 nurses per 1000 inhabitants had a lower [18].

The number of health professionals with secondary and higher levels of education has increased in private health

institutions, general hospitals, clinical hospitals, and university clinics. A decrease in the number of health professionals is recorded at the level of primary health care in the Health Centres for 86 health workers, which is 4.5% of the employees in 2021, in contrast to 2012 [4, 5].

**TABLE 8.** Number of health professionals with secondary and higher level of education by job position, in primary and preventive health care, 2013-2021

	General Medicine Service	Occupational Medicine Service	Women's Health Care Service	Children's Health Care Service	Patronage service	Total
2013	1 459	58	137	353	↓	2 353
2021	1 825	107	157	327	↓	2 612

The total number of health professionals with secondary and higher level of education in primary and preventive health care increased by 259 employees in the general, occupational medicine, and women's health care services. The largest decrease in the number of health workers is observed in the patronage service for 66 employees, which represents 19% of the employees from 2013, in contrast to 2021. A decrease of 26 employees was also recorded in the service for children's health care [8, 12].

#### Review and analysis of nursing in North Macedonia in relation to the possibility of education and unemployment

The formal education of nurses in North Macedonia takes place at the level of secondary four-year education for he-

alth care assistants and higher professional three-year education with the possibility of one-year specialization. Informal education is carried out through training, workshops, and seminars organized by the Association of Nurses, Health Technicians, and Midwives of the North Macedonia.

A total of 1,615 students enrolled in secondary educational institutions for nursing in 2023/24. This course is available in most cities, and the most enrolled students were in Skopje, Tetovo, Gostivar and Kumanovo [19].

Nursing studies are conducted at universities, faculties, and higher professional schools. According to the Law on Higher Education, first cycle studies are: first cycle of academic studies (undergraduate studies) and first cycle of professional studies. Second cycle studies are: second cycle of academic studies (postgraduate studies) and second cycle

**TABLE 9.** Number of secondary school students according to municipalities 2023/24

MUNICIPALITY	Number 2023/24
BITOLA MUNICIPAL SECONDARY MEDICAL SCHOOL "Dr. JOVAN KALAUZI"	68
BOGDANCI MUNICIPAL SECONDARY SCHOOL "BOGDANCI"	25
VELES SECONDARY VOCATIONAL MUNICIPAL SCHOOL "DIMITRIJA CHUPOVSKI"	34
GOSTIVAR SECONDARY MUNICIPAL MEDICAL SCHOOL "GOSTIVAR"	175
KICHEVO MUNICIPAL SECONDARY SCHOOL "MIRKO MILESKI" AND "DRITA"	68
KRIVA PALANKA SECONDARY MUNICIPAL SCHOOL "GYORCHE PETROV"	25
KUMANOVO MUNICIPAL SECONDARY TECHNICAL SCHOOL "NACE BUJONI"	170
LIPKOVO SECONDARY MUNICIPAL SCHOOL "ISMET JASHARY"	34
OHRID SECONDARY MUNICIPAL VOCATIONAL SCHOOL "Ss. Cyril and Methodius"	34
PRILEP SECONDARY MUNICIPAL SCHOOL "MIRCHE ACEV" HIGH SCHOOL	68
SKOPJE SECONDARY MEDICAL SCHOOL OF THE CITY OF SKOPJE "Dr. PANCHE KARADJOZOV", "CVETAN DIMOV", "MARIJA KIRI SKLODOVSKA", "SHAIP JUSUF", "SARAJ"	510
STRUGA SECONDARY MUNICIPAL SCHOOL "NICO NESTOR"	50
STRUMICA SECONDARY MUNICIPAL SCHOOL "DIMITAR VLAHOV"	34
TETOVO SECONDARY MUNICIPAL MEDICAL SCHOOL "NICOLA STEIN"	245
SHTIP SECONDARY MUNICIPAL SCHOOL "JANE SANDANSKI"	75
TOTAL	1615



**TABLE 10.** Number of students by year of study at higher education institutions in the field of nursing 2022/23

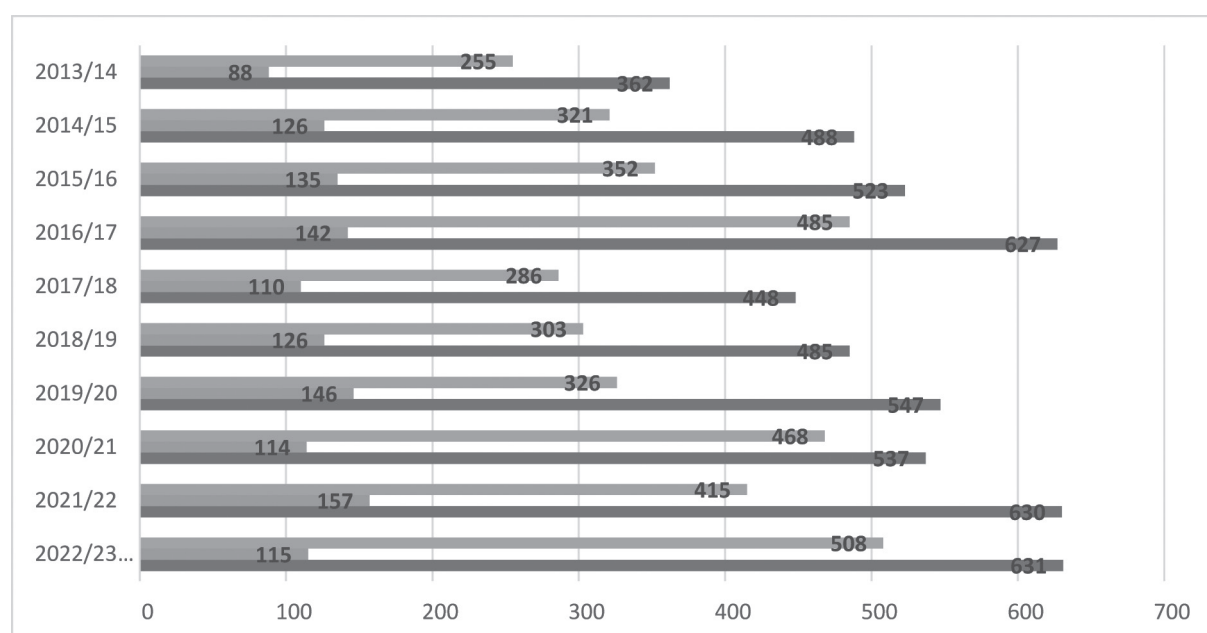
INSTITUTION AND STUDY PROGRAM	Method of studying	Total	first year	second year	third year
Higher Medical School - Bitola General Nurse	total	200	47	36	117
	regular	114	34	18	62
Medical faculty – Skopje Vocational studies nurses / technicians	total	327	82	122	123
	regular	222	60	87	75
Faculty of Medical Sciences – Shtip – Nursing	total	336	105	99	132
	regular	158	60	35	63
University of Tetovo - Faculty of Medical Sciences - Nursing	total	652	142	154	356
	regular	437	107	95	235
International Balkan University – Vocational medical school – Skopje Nursing	total	74	52	22	
	regular	74	52	22	
Southeast European University, Faculty of Health Sciences – Tetovo Nursing	total	18	18		
	regular	18	18		
Total	Total	1607	446	433	728
	regular/	1023	331	257	435
	irregular	584	115	176	293

of professional studies. Training for nurses with a general profile is a study program of a regulated profession and lasts at least three years or includes 4,600 hours of theoretical and clinical training, with the period of theoretical training representing at least one-third and the period of clinical training representing at least one-half of the minimum duration of training [20].

A total of 1,607 students studied at higher education institutions in 2022/23, of which 1,023 were full-time regular and 584 part-time irregular students [21].

The number of students enrolling in a first-year nursing study program is continuously growing, both full-time regular and part-time irregular. Thus, in 2013/14, a total of 362 students were enrolled, and in 2022/23, a total of 631 students were enrolled, which is an increase of 57.4%. This trend demonstrates the growing interest in pursuing a nursing study program, which has become more pronounced in recent years [21, 22].

The largest number of unemployed nurses in the Employment Agency were registered with a completed secondary vocational education, 1,174 or 90.3% of all registered from that profile [23].

**CHART 4.** Enrolled students in the first year of a nursing study program by year according to study method

**TABLE 11.** Number of nurse profile reported to the Employment Agency in 2015

Profile reported to the Employment Agency	Number	%
health care assistant - secondary level of education	1174	90,3
Nurses with higher level of education	28	2,2
Nurses with university level of education	98	7,5
Total	1300	100,0

### Conclusions and recommendations

The following conclusions can be drawn from the above analysis regarding nursing in North Macedonia in terms of the level of education, staff, and career development.

Regarding education, it can be concluded that the number of students enrolling in nursing programs at the secondary and higher education levels is growing. The current education of nurses at the level of vocational studies represents an obstacle in the career of nurses who wish to engage in scientific research work.

According to the Law on Higher Education, there is no obstacle to the introduction of academic studies for nurses, and then the introduction of a second and third cycle of studies.

Regarding the staff, the number of nurses at all levels of health care is increasing.

The number of nurses at the primary health care level in polyvalent patronage and child protection is decreasing.

The number of nurses per 1000 inhabitants and the ratio of nurse doctors are still far below the level of the countries and the EU average.

A greater number of nurses (or these are health care assistants?) in the period 2019-2021 have been recognized for their higher education without changing the systematization and organization of jobs, whereby two nurses receive a salary depending on the level of education in a position with the same tasks.

Regarding the vital health indicators and socioeconomic characteristics of the population, we can conclude that the population in North Macedonia is aging, and the need for nursing care is increasing. There is a shortage of nurses and doctors, which further complicates the situation in terms of patient needs for nursing care.

As a result of the analysis and conclusions, the following recommendations can be given: enhance the quality of nursing education, ensuring that future nurses are well-prepared to meet the evolving needs of healthcare. There is a need for better organization and standardization of nursing roles, tailored to the level of each nurse's education and competencies. A priority is also to increase the number of nurses across all levels of the healthcare system, with a special focus on strengthening primary health care. In line with this, job catalogs should be updated to reflect modern educational programs and the actual scope of nursing practice. Lastly, it is essential to empower nurses to take a more active role in promoting the health of the elderly and adults, focusing on the prevention and management of chronic diseases through education, early detection, and community engagement.

Nurses should collaborate with clear goals, recognizing the opportunities for the development of nursing, which will help them overcome the challenges and build the capacity for a strong voice in the direction of reforms in nursing in North Macedonia.

**Authors declare no conflict of interest.**

**Nema sukoba interesa.**

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