



Weighing Up Risk Factors for Non-Communicable Diseases in Athlete Students: A Cross-Sectional Study of Perceived Health Status

Abovyan V. A.¹, Nalbandyan G. L.¹, Petrosyan T.R.^{1,2}

¹ Department of physical rehabilitation, Armenian Institute of physical culture and sports, Yerevan, Armenia

² “Sport EMI” Human Performance Research Center. Armenian Institute of physical culture and sports, Yerevan, Armenia

(Received: 16 January 2025

Revised: 20 February 2025

Accepted: 31 March 2025)

KEYWORDS Non-communicable diseases; risk factors; smoking; alcohol consumption; unhealthy nutrition; physical inactivity; sleep disorder.	ABSTRACT: Introduction: Non-communicable diseases (NCD) disproportionately affect the population, showing higher prevalence in low- and middle-income countries, where more than three-quarters (31.4 million) of global NCD deaths occur. Each year, 17 million deaths in the population younger than 70 years of age are attributed to NCDs and 86% of these premature deaths occur in low- and middle-income countries. Objectives: The purpose of the presented study was to assess the prevalence of risk factors of NCDs among the physical education and kinesiology students involved in different educational programs at ASIPCS and to demonstrate the dynamics of selected risk factors <i>across different time periods</i> . Methods: A questionnaire was developed, which was the modified version of the Noncommunicable Disease Surveillance, Monitoring and Reporting instrument provided by WHO, and included 22 questions, of which only 4 contain general information, the others were related to risk factors for chronic non-infectious diseases. Results: The analysis of selected risk factors among athlete students revealed that 80% of the respondents had at least one of the risk factor, and 34% had at least two risk factors. Risk factors for NCDs are prevalent among students and their percentage increases during the student years. Among the risk factors, particularly increasing shifts were observed in nutrition (breakfast, fruit and vegetable consumption), physical activity (inactivity, sedentary lifestyle) and weight (overweight, obesity). Positive dynamics are observed in smoking and sleep factors, revealing that girls smoke more in the 1st year and the number of smokers decreases by half in the 4th year. Conclusions: The athlete students usually have better health indices than their peers. Additional research with a large number of participants is needed to confirm the dynamic changes in risk factors impacting the students.
--	---

1. Introduction

Each year 41 million people die due to Noncommunicable diseases (NCDs), accounting for 74% of all deaths worldwide. NCDs disproportionately affect the population, showing higher prevalence in low- and middle-income countries, where more than three-quarters (31.4 million) of global NCD deaths occur. Each year, 17 million deaths in the population younger than 70 years of age are attributed to NCDs and 86% of these

premature deaths occur in low- and middle-income countries [1,2].

The group of four major types of NCDs encompasses cardiovascular disease (CVDs), type 2 diabetes, malignancy, and chronic respiratory diseases, all of which have the following major behavioral risk factors: smoking, alcohol abuse, physical inactivity, and unhealthy diet. These four factors in turn lead to overweight and obesity, elevated blood pressure,



elevated blood cholesterol and glucose levels, and ultimately resulting in a non-communicable disease [2,8]. In many studies, a high prevalence of behavioral risk factors for NCDs and the simultaneous impact of different risk factors have been documented [4,10]. Some recent studies have evaluated the role of sleep disturbances as a behavioral risk factor for NCDs, particularly obesity and cardiovascular disease, and despite the major focus of many behavioral interventions to modulate physical inactivity, alcohol abuse, smoking, and unhealthy eating, recent research reports suggest that sleep duration and sleep timing also represent serious risk factors that should be targeted for effective prevention of chronic diseases and premature deaths [12, 14, 18, 19, 20]. New findings provide quantitative, objective evidence that better sleep quality and longer sleep duration are strongly associated with better academic performance in students [11,21]. Student life is an important transition period from adolescence to young adulthood, which brings many challenges and difficulties for the students, particularly the athlete students, due to lifestyle changes, separation from home and family, new living environment, new and unfamiliar friendships, physical and emotional problems, and possible financial difficulties. The college or university years are a critical period for the acquisition and long-term impact of NCD risk factors, so different intervention strategies used to reduce the burden of NCDs should target these specific age groups in population. [3,5,6,7,9,22-26]

Increase in behavioral risk factors among adolescents and young adults have been documented in Armenia and according to the national surveys, almost 16% of 15-year-old boys smoke, 19% of 17-year-old boys and 12% of girls have used hookah at least once, not more than 42% girls and 53% of boys (15-year-old) are having breakfast regularly before attending the school, and not more than 69.6% exercise regularly [16].

Overweight and obesity were found in 9% of 15-year-old girls and 23% of boys of the same age. The prevalence of overweight increases rapidly with age and among the 15-19 age group it is 12.8% [16, 17]. At least 87.3% of graduate students of the Armenian State Institute of Physical Culture and Sport (ASIPCS) are exposed to at least one of the above-mentioned risk factors [15].

2. Objectives

Based on the documented evidence we have designed a study to clarify the prevalence of risk factors of non-communicable diseases among athlete students of ASIPCS, comparatively weighing the identified risk factors. The purpose of the presented study was to assess the prevalence of risk factors of NCDs among the physical education and kinesiology students involved in different educational programs at ASIPCS and to demonstrate the dynamics of selected risk factors across different time periods.

3. Methods

The research was conducted at the Armenian State Institute of Physical Culture and Sports using the survey questionnaire developed by us and validated among the subgroups of last year (fourth year) undergraduate and graduate students. The study group selection was based on the estimated level of poor or satisfactory self-esteem, which fluctuates during the four-year study program. Research evidence indicates that the worst level of self-esteem is reportable to the students of the first and last academic year [22]. Two hundred and thirty-five students participated in the survey. The inclusion criteria for the study included the following: being an athlete student, not younger than 16 and not older than 25 years of age, involvement in the academic programs at ASIPCS. Exclusion criteria included the conditions that potentially could impact the study outcomes: diagnosed with any disease, major surgery in the last 24 months, reported psychological and/or psychiatric and neurological conditions. The objectives of the research were explained to each participant and all participants have provided their informed consent to participate in the study.

The developed questionnaire, which was the modified version of the Noncommunicable Disease Surveillance, Monitoring and Reporting instrument provided by WHO [27], and included 22 questions, of which only 4 contain general information, the others were related to risk factors for chronic non-infectious diseases. Two items included in the questionnaire were related to sleep duration and bedtime.

The questions included in the survey were grouped into the following main categories: general information, smoking, nutritional characteristics, alcohol consumption, weight, height and physical activity, sleep



duration and bedtime. A face-to-face survey with a questionnaire was conducted by the same rater to avoid issues with data collection reliability. All indicators were presented as absolute numbers and rates (%).

The Statistical Package for the Social Sciences (SPSS) version 20 was used to perform the statistical analysis. The categorical variables (age, gender, smoking habits and others) were compared with the year of study using chi square test. The quantitative variables were compared with the years of study using analysis of variance (one-way ANOVA) test. A p value of <.05 was considered significant.

4. Results

The main feature of this study is that at the time of the survey, all participants were at the institute and were involved in various activities (lectures, practical work, exams). The number of respondents by age group, gender, level of education (1st and 4th years), employment and field of work, and family status is presented in the table below. As presented in the table, the first-year male participants make up 74.8%, but their number decreases

in the fourth year and makes up 65.1% of the students. One explanation is that some male students do not continue their studies in their chosen field after being recruited for the military service, and the other part simply quitted the institute and did not continue their program.

As can be seen from the table, before obtaining a specialty, students go to work, then most of them continue working in their chosen specialty or a related field. 14.1% of the respondents (n=33) work in various healthcare institutions (hospitals, rehabilitation canter, primary health care facilities (polyclinics, health centres)) and fitness canter and gyms. Moreover, the employment of 4th year students in this field is higher and amounts to 27.7% (n=31). According to the results of the survey, 65.1% of students (n=153) are unemployed, with the number of unemployed students being highest in the 1st year and making up 78.2% (n=96), while the number of unemployed students is decreasing among the 4th year students and making up 57.7% (n=57).

Table 1 Descriptive characteristics of study participants

Level of education	I year students (N, %)	IV year students (N, %)	Total (N, %)
Age groups	123	112	235
Less than 20 years of age	102 (91 %)	0	102 (43.4 %)
Over 20 years of age	21 (9 %)	112 (100 %)	133 (56.6 %)
Gender			
Male	92 (74.8 %)	73 (65.1 %)	165 (70.2 %)
Female	31 (25.2 %)	39 (34.9 %)	70 (29.8 %)
Work outside the university			
Agricultural	2 (1.6 %)	3 (2.9 %)	5 (2.1 %)
Industrial/Construction	2 (1.6 %)	2 (1.8 %)	4 (1.7 %)
Clerical	18 (14.6 %)	17 (15.1%)	35 (14.9 %)
Self employed	3 (2.4 %)	2 (1.8 %)	5 (2.1 %)
Health/Sports Industry	2 (1.6 %)	31 (27.7 %)	41 (17.4 %)



Unemployed	96 (78,2 %)	57 (50.7 %)	145 (61.8 %)
Marital Status			
Married	4 (3.2 %)	6 (5.4 %)	10 (4.3 %)
Single	118 (95.9%)	104 (92.7 %)	222 (94.4 %)
Divorced	1 (0.8 %)	2 (1.9 %)	3 (1.3 %)

As a result of the survey, we received quite interesting answers regarding self-assessment of health, which are presented in Table 2. According to the table, none of the 4th year students assessed their current health status as

“bad”. 51.2% (n=63) and 75.8% (n=85) of the 1st and 4th year students, respectively, assessed their current health status as “good”.

Table 2 Self-reported health of respondents by education level

Education level \ Self-reported health status	I year		II year		Total	
	Number	%	Number	%	Number	%
Good	63	51.2	85	75.8	148	62.9
Satisfactory	56	45.5	27	24.2	83	35.3
Bad	4	3.3	0	0	4	1.8
Total	123	100	112	100	235	100

Table 3 Prevalence of risk factors among respondents

Risk factors	Total (%)	I-year n (%)	IV-year n (%)	p
Smoking				
Smokers	55(23.4)	30(24.3)	25(22.3)	P= 0.2200
Passive smokers	93(39.6)	41(33.3)	52(46.6)	
Nutrition				
Having breakfast	97(41.2)	68(55.2)	29(25.8)	P< 0.001
Daily consumption of fruits and vegetables (400 mg per day)				p< 0,05
.Do not consume	5(2.1)	4(3.5)	1(0.8)	
.Consume up to 400 mg	88(37.4)	40(35.7)	48(39)	
.Consume 400 mg and more	47(20)	15(13.3)	32(26)	



.Consume not every day	95(40.5)	53(47.3)	42(34.2)	
Alcohol consumption in the last month	191(85.6)	92(74.8)	99(88.4)	P < 0.01
Physical activity				
.are underactive	34(14.5)	15(12.1)	19(17)	P=0.3003
.are physically active	201(85.5)	108(87)	93(83)	
.sedentary				
Up to 4 hours	80(34)	33(26.8)	47(42)	P < 0,05
4-8 hours	91(38.7)	56(45.5)	35(31.2)	
More than 8 hours	64(27.3)	34(27.7)	30(26.8)	
Sleep time				
Up to 6 hours	32(13.5)	9(7.3)	23(20.5)	P < 0,05
6-7 hours	59(25.1)	31(25.3)	28(25)	
7-8 hours	122(51.9)	72(58.5)	50(44.6)	
More than 8 hours	22(9.5)	11(8.9)	11(9.9)	
Going to bed				
Before 12PM	75(31.9)	34(27.6)	41(36.6)	P = 0.1417
After 12 PM	160(86.1)	89(72.4)	71(63.4)	
Mody mass Index (BMI)				P < 0,01
Underweight (BMI <18,5)	4(1.7)	4(3.2)	0 (0)	
Normal weight (BMI =18,5<25)	214(91.1)	113(91.9)	101(90.2)	
Overweight (BMI =25<30)	10(4.2)	6(4.9)	4(3.6)	
Obesity (BMI >30)	7(2.9)	0 (0)	7(6.2)	

From Table 2, we conclude that employed students reported a higher level of good general health, which is statistically significant ($P=0.0002$) and is also confirmed by the comparison of other survey data. The prevalence of risk factors among the respondents is presented in Table 3.

5. Discussion

During the development of the questionnaire, we had identified two environments for passive smoking: home and workplace, but analysing the results of the study, we found that there are few cases when a student was a passive smoker in the work environment, so during the

analysis we did not pay specify the environment and defined the passive smoking as a single category. As shown in the table 3, 39.6% of the respondents ($n=93$) were considered passive smokers. Overall, 23.4% of students ($n=55$) were smokers, including 24.3% of first-year students ($n=30$) and 22.3% of fourth-year students ($n=325$). A greater proportion of students 76.6% ($n=180$) did not smoke, including 75.7% of first-year students ($n=93$) and 77.7% of fourth-year students ($n=87$). These data were not statistically reliable. As can be seen from Table 3, there was no significant difference in terms of gender between smoking students in the first and fourth years, and in both cases, male smokers make up



approximately 29.6%, which is 28.2% (n=26) and 31.5% (n=23), respectively. Female smokers made up 8.6%, but there was a significant difference between first- and fourth-year students, which was 12.9% (n=4) and 5.1% (n=2), respectively.

When studying the rate of “having breakfast”, we defined the number of students who have breakfast at home. According to the study, 41.2% of the survey participants (n=97) have breakfast at home, which is 55.2% (n=68) and 25.8% (n=29) for 1st and 4th year students, respectively. According to Table 3, a large number of 4th year students do not eat breakfast - 74.2% (n=83) and these indicators are statistically significant ($P < 0.001$), and in interviews this circumstance was explained by a busy work schedule. The main issue related to nutrition, which we identified during the study, was the consumption of 400 g or more of vegetables and fruits by students every day. Only 57.4% of respondents (n=135) consumed fruits and vegetables every day, but 37.4% of them (n=88) did not mention the necessary 400 g, and for 1st and 4th year students the proportion was 39% (n=48) and 35.7% (n=40), respectively. According to the data presented in table 3, only 20% of students (n=47) met the WHO requirements for daily consumption of fruits and vegetables, and for 1st and 4th year students it was 26% (n=32) and 13.3% (n=15), respectively. According to the study, 1st-year students had healthier eating habits than 4th-year students. A particular feature for the 4th-year students was the fact that 47.3% (n=53) of them consume vegetables and fruits not every day, while this figure was lower for 1st-year students and is 34.2% (n=42).

As can be seen from Table 3, 14.4% (n=34) of the respondents do not consume alcohol, and for 1st- and 4th-year students it was 25.2% (n=31) and 11.6% (n=13), respectively. Approximately 85.6% (n=38) of the survey participants indicated that they consume alcohol 2-3 times a month.

The data showed that 4.2% (n=10) of the respondents were overweight, 2.9% (n=7) were obese, and 91% (n=214) had a BMI within the normal range. At the same time, overweight girls made up 5.7% (n=4) of the female respondents, and obese girls made up 7.3% (n=5), while normal weight (BMI =18.5<25) females were the most numerous, 84.2% (n=59). According to the study, among male respondents, normal weight respondents made up 93.9% (n=155), and obese respondents made up 1.2%

(n=2). As can be seen from Table 3, 91.9% (n=113) of the 1st year respondents had a normal weight, 4.9% (n=6) were overweight, and 3.2% (n=4) were underweight. Interestingly, there were no obese students in the 1st year, but in the 4th year they made up 6.2% (n=7). In the 4th year, 90.2% (n=101) of the 4th year respondents had a normal weight, 3.6% (n=4) were overweight, and there were no underweight students. Analysis revealed that 85.5% (n=18) of the respondents were physically active, with a small difference between the two genders. Physical activity was higher in the 1st year and is 87.9% (n=108), and in the 4th year it was 83% (n=93).

A proportion of study participants (38.7% or n=91) spend sedentary each day 4-8 hours, with 45.5% (n=56) and 31.2% (n=35) of respondents in the 1st and 4th years, respectively. Similarly, 27.3% (n=64) of respondents spend sedentary each day more than 8 hours, with 27.7% (n=34) and 26.8% (n=30) of respondents in the 1st and 4th years, respectively, and these data were statistically significant ($P < 0.05$).

The last item in our questionnaire concerns sleep duration. As a result of the study, we found that 13.5% of respondents (n=32) sleep up to 6 hours, with this number being especially high among males, at 17.6% (n=29), whereas 25.1% of the survey participants (n=59) sleep 6-7 hours a night, which is the same as for 1st and 4th year students.

It became evident from Table 3 that the majority of respondents sleep 7-8 hours and it is 51.9% of respondents (n=122). According to the study results, only 7.3% (n=9) of respondents in the 1st year sleep up to 6 hours at night, but among the 4th year students, those who sleep up to 6 hours are 20.5% (n=23) and these data are statistically significant ($P < 0.05$).

According to Table 3., only 31.9% (n=75) of the participants in the study goes to bed until 24.00, while this indicator was higher among 4th year students and amounted to 36.6% (n=41), and among 1st year students the rate was 27.6% (n=34). However, these data were not statistically reliable. At the same time, as documented in the Table 3, the majority of the respondents goes to bed after 24.00 and it is especially common among 1st year students with the rate of 72.4% (n=89).



The analysis of risk factors among students also revealed that 80% of the respondents had at least one risk factor, and 34% had at least two risk factors.

References

1. World Health Organization. Non-communicable diseases 2022. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>.
2. Noncommunicable Diseases Progress Monitor 2022. World Health Organization 2022. <https://www.who.int/publications/i/item/9789240047761>.
3. Changoh, C.M., Tatah, L., Aroke, D. et al. Noncommunicable diseases behavioral risk factors among secondary school adolescents in Urban Cameroon. *BMC Public Health* 24, 377 (2024). <https://doi.org/10.1186/s12889-024-17753-1>
4. M Y, Kagathara N, Ram R, Misra S, Kagathara J. Exploring Behavioral Risk Factors for Non-communicable Diseases Among Undergraduate Medical Students in Western Gujarat: A Cross-Sectional Study. *Cureus*. 2023 Nov 21;15(11):e49188. doi: 10.7759/cureus.49188. PMID: 38130566; PMCID: PMC10734890.
5. Rahamathulla MP, M MS. Frequency and Awareness of Risk Factors of Non-Communicable Diseases among University Students in Saudi Arabia. *Pak J Med Sci*. 2020 May-Jun;36(4):740-745. doi: 10.12669/pjms.36.4.2400. PMID: 32494266; PMCID: PMC7260916.
6. Nowsheen F, Islam F, Siddiqueea Y, Ahsan M, Pavel MAM, Majumder T, Bhuiyan R, Barua L, Banik PC, Faruque M, Zaman MM. Noncommunicable disease risk factors among postgraduate students in Dhaka city, Bangladesh: a multi-centric cross-sectional study. *J Xiangya Med* 2021;6:30.
7. Monteiro LZ, Varela AR, Spinola MS, Carneiro MLA, Oliveira DMS, Toledo JO. High prevalence of risk factors for non-communicable diseases in university students of a nursing course. *Cad. Saúde Colet.*, 2023; 31(1):e30040429. <https://doi.org/10.1590/1414-462X202230040429>
8. World Health Organisation Noncommunicable diseases: Risk factors <https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/ncd-risk-factors>
9. Petrosyan T. Initial training facilitates posttraumatic motor recovery in rats after pyramidal tract lesion and in conditions of induced regeneration. *Somatosens Mot Res*. 2015;32(1):21-4. doi: 10.3109/08990220.2014.940078.
10. Supa Pengpid, Karl Peltzer, Prevalence and correlates of multiple behavioural risk factors of non-communicable diseases among university students from 24 countries, *Journal of Public Health*, Volume 43, Issue 4, December 2021, Pages 857–866, <https://doi.org/10.1093/pubmed/fdaa138>
11. Okano K, Kaczmarzyk JR, Dave N, Gabrieli JDE, Grossman JC. Sleep quality, duration, and consistency are associated with better academic performance in college students. *NPJ Sci Learn*. 2019 Oct 1;4:16. doi: 10.1038/s41539-019-0055-z. PMID: 31583118; PMCID: PMC6773696.
12. Nikbakhtian S, Reed AB, Obika BD, Morelli D, Cunningham AC, Aral M, Plans D. Accelerometer-derived sleep onset timing and cardiovascular disease incidence: a UK Biobank cohort study. *Eur Heart J Digit Health*. 2021 Nov 9;2(4):658-666. doi: 10.1093/ehjdh/ztab088. PMID: 36713092; PMCID: PMC9708010.
13. Shahram Nikbakhtian, Angus B Reed, Bernard Dillon Obika, Davide Morelli, Adam C Cunningham, Mert Aral, David Plans, Accelerometer-derived sleep onset timing and cardiovascular disease incidence: a UK Biobank cohort study, *European Heart Journal - Digital Health*, Volume 2, Issue 4, December 2021, Pages 658–666, <https://doi.org/10.1093/ehjdh/ztab088>
14. Kwon, S., Lee, H., Lee, JT. et al. Sleep duration and mortality in Korean adults: a population-based prospective cohort study. *BMC Public Health* 20, 1623 2020. <https://doi.org/10.1186/s12889-020-09720-3>
15. V. Abovyan, G. Nalbandyan, G. Atsatryan, Prevalence of risk factors for non-communicable diseases in graduate students. *Science in sports: Current issues*. Yerevan. Armenian State Institute



- of Physical Culture and Sports, 2023.N2(9), 221 pages
16. Assessment of the performance of the healthcare system, Armenia 2023 / D. Andreasyan, A. Bazarchyan, K. Saribekyan, A. Aghazaryan, A. Arzumanyan, I. Torgomyan, Sh. Isahakyan, A. Simonyan, S. Pahlevanyan.- Yerevan.: RA Ministry of Health "National Institute of Healthcare after Academician S. Avdalbekyan" CJSC, 2023.- 187 pages.
 17. Assessment of the performance of the healthcare system, Armenia 2022 / D. Andreasyan, A. Bazarchyan, S. Manukyan.- Yerevan: RA Ministry of Health "National Institute of Healthcare after Academician S. Avdalbekyan" CJSC, 2022.-243 pages.
 18. Francesco P. Cappuccio, Daniel Cooper, Lanfranco D'Elia, Pasquale Strazzullo, Michelle A. Miller, Sleep duration predicts cardiovascular outcomes: a systematic review and meta-analysis of prospective studies, *European Heart Journal*, Volume 32, Issue 12, June 2011, Pages 1484–1492, <https://doi.org/10.1093/eurheartj/ehr007>
 19. Kanki, M., Nath, A.P., Xiang, R. et al. Poor sleep and shift work associate with increased blood pressure and inflammation in UK Biobank participants. *Nat Commun* 14, 7096 2023. <https://doi.org/10.1038/s41467-023-42758-6>
 20. Adriana Kramer Fiala Machado, Andrea Wendt, Ana Maria Baptista Menezes, Helen Gonçalves, Fernando C. Wehrmeister, Sleep clusters and modifiable risk behaviors for noncommunicable diseases in young adults: Data from a birth cohort in Brazil, *Sleep Health*, Volume 9, Issue 3, 2023, Pages 346-353, ISSN 2352-7218, <https://doi.org/10.1016/j.sleh.2023.01.004>.
 21. Zeek ML, Savoie MJ, Song M, Kennemur LM, Qian J, Jungnickel PW, Westrick SC. Sleep Duration and Academic Performance Among Student Pharmacists. *Am J Pharm Educ*. 2015 Jun 25;79(5):63. doi: 10.5688/ajpe79563. PMID: 26396272; PMCID: PMC4571043.
 22. Szepe, O., Meszaros, A. Assessing well-being of university students and evaluation of its determinants. *BMC Public Health* 24, 2862 (2024). <https://doi.org/10.1186/s12889-024-20287-1>
 23. Tigran Petrosyan, Hasmik Mkrtychyan and Naira Martirosyan. (2021). Can behavioral interventions increase physical activity in youth with cerebral palsy? A scoping review. *Health Prob Civil.*; 15(4): 315-322
 24. Petrosyan T.R. (2013). Effects of resistance training on cognitive functions in elderly. *New Armenian Medical Journal*. Vo 1 . 7 (2 0 1 3) , N o 3 , p . 78-84
 25. Petrosan T.R, Mkrtychyan H.H., Koloyan H.O., Petrosyan A.M., Martirosyan N.Y. (2021). Correlators of back muscle electromyographic and gait analysis data as a basis for exercise prescription in patients with lumbar disc herniation. *Physiotherapy Quarterly* Volume 4, 29(4), 49–59.
 26. Sowmiya Kumar, Ali Shamyar, Janardanan Kumar, Ria Murugesan, Tigran Petrosyan. Mental Health Challenges in Medical Education: Prevalence of Depression and Stressors among Medical Students in Armenia. *Journal of Chemical Health Risks*, 2025, 15(1), 568-573
 27. GBD 2021 Diseases and Injuries Collaborators. Global incidence, prevalence, years lived with disability (YLDs), disability-adjusted life-years (DALYs), and healthy life expectancy (HALE) for 371 diseases and injuries in 204 countries and territories and 811 subnational locations, 1990-2021: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet*. 2024 May 18;403(10440):2133-2161. doi: 10.1016/S0140-6736(24)00757-8.