



## Observable Effects of Atmospheric Pollution on Outpatient and Inpatient Morbidity in Bulgaria

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### Abstract

**Background:** One of Europe's most well-developed industrial regions is found in the Republic of Bulgaria. The industrialization of the region has a big impact on air pollution. Thermal power plant "Maritza East" (the largest of its kind in southeastern Europe), the army training range, machine manufacturers, household heating and high volume of automobile traffic are all major sources of pollution in the region.

**Methods:** A five year study (2009-2013) followed yearly concentrations of principal atmospheric pollutants such as sulfur dioxide, dust, nitrogen dioxide, lead aerosols and hydrogen sulfide, and the way in which those levels had an effect on morbidity (outpatient and inpatient medical care) in the area. Statistical processing of data has been completed to represent and analyze the collected data in nonparametric and alternative format.

**Results:** Atmospheric pollution affects human health directly through pathological changes in the human organism. The registered outpatient care provided for the period 2009-2013 is highest for diseases of the cardiovascular system (11.85%), the respiratory system (17.34%) and the genitourinary system (9.76%). The registered rate of hospitalization for the same period is for diseases of the digestive system (11.90%), the cardiovascular system (11.85%), respiratory system (10.86%) and the genitourinary system (8.88%).

**Conclusion:** The observed period shows a decrease in average yearly concentrations of the principal atmospheric pollutants in the industrial region (Bulgaria) and reflects a decrease in morbidity based on outpatient care and an increase in morbidity by inpatient care (hospitalization). Our findings should be corroborated in future longitudinal studies.

**Keywords:** Atmospheric pollution, Morbidity, Industrial region, Bulgaria

### Introduction

Pollution of the atmosphere contributes to global pollution. The beginning of the twenty first century saw a rise in urbanization and industrialization which exacerbated such problems and their disturbance of the ecological infrastructure of the world.

Atmospheric pollution affects human health directly through pathological changes in the human organism and indirectly through the erosion of ecological systems, destruction of cultural and architectural monuments and memorials, and others. All of this is related to economic losses as well (1).

Marie-Eve Heroux of the World Health Organization's Regional Office for Europe stated that "Air pollution affects everyone in developed and developing countries alike". Globally, total pollution of nature is responsible for causing a quarter of all diseases (2). Most vulnerable to these effects are children, asthmatics, older people and the sick. The health risk is higher for people living in the highly industrialized regions of Europe. Therefore, the goal of the European Union in protecting the environment is to decrease atmospheric pollution. This is accomplished by restricting emissions, and

## UNIFIED RESCUE SYSTEM IN REPUBLIC OF BULGARIA - ORGANIZATIONAL STRUCTURE AND MANAGEMENT

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### ABSTRACT

**Background.** The Unified Rescue System (URS) with emergency number 112 in Republic of Bulgaria is a part of the civil protection (CP) system in the country. National system 112 provides continuous assistance to the population in emergency situations, criminal acts, acts of terrorism and disasters. The main and additional components of URS work according to basic principles and organizational structure of CP system in the country. Coordination of activities follows the legislation of protection of the population. Civil Protection legislation is based on the Supreme Law of the country: the Constitution of the Republic of Bulgaria. In Europe and Bulgaria is reported enhancing the danger from man-made disasters. This requires examine in depth the organizational structure and management of URS in Republic of Bulgaria.

**Methods.** Descriptive analysis of the laws and regulations, in Bulgaria concerning organizational structure and mechanisms for management of the components of URS in Bulgaria for major disasters, accidents and catastrophes.

**Results.** According to collected data on the organizational structure of the URS it is reported coverage and provided protection for all citizens of the Republic of Bulgaria as well as for temporary foreign residents. According to available information mainly focusing on the population and the forces of URS is in several major cities including the capital. In case of disaster has a real opportunity for redirecting the efforts of URS to the stricken region in the country. There is a need for regularly conducting trainings on protection of the population at all levels of protection.

**Conclusion.** There is an increasing number of emergency and disasters situation which underlines the importance of effective working of URS. The requirements for the provision of URS in Bulgaria are becoming stricter. The URS in Bulgaria is guaranteed to all those in need of it. The country has a concept for the future development of the system of URS.

**Keywords:** Unified Rescue System; organizational structure and management, disaster situations, Republic of Bulgaria.

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#### Aim and tasks

The aim of the study is to examine the current organizational structure and management of URS in significant and serious disasters, accidents and catastrophes in Bulgaria.

To achieve the goal we set the following tasks:

1. To analyze the legal and normative documents, decrees and procedures in Bulgaria on the organizational structure of the URS in Bulgaria.

2. To analyze the legal and normative documents, decrees and procedures in Bulgaria on the management of URS in Bulgaria in case of serious emergency and disaster situations.

**Methods.** Descriptive analysis of the laws and regulations, in Bulgaria concerning organizational structure and mechanisms for management of the components of URS in Bulgaria for major disasters, accidents and catastrophes.

**Results.** According to collected data on the organizational structure of the URS it is reported coverage and provided protection for all citizens of the Republic of Bulgaria as well as for temporary foreign residents. According to available information mainly focusing on the population and the forces of URS is in several major cities (Varna, Ruse, Plovdiv, Burgas) including the capital Sofia. In case of disaster has a real opportunity for redirecting the efforts of URS to the stricken region in the country. There is a need for regularly conducting trainings on protection of the population at all levels of protection [7, p. 428; 8, p. 3; 9, p. 5; 10, p. 8; 11, p. 7; 12, p. 6; 13, p. 4].

In Bulgaria a common and serious medical situation in the affected regions in the event of different types, sizes and severity Disastrous Situations (DS) are created. The disasters are characterized by the coverage of different sized areas with specific geographical, demographic and economic characteristics. The most typical disasters for the country are

## A YEAR-LONG STUDY ON THE DISINFECTION OF DRINKING WATER SUPPLIED TO RURAL AREAS IN STARA ZAGORA MUNICIPALITY, BULGARIA<sup>1</sup>

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*Scientific paper*

### Summary

According to national reports Bulgarian villages and small towns are often affected by failures in drinking water disinfection due to inaccurate manual chlorination and negligence from water supply employees. Last year the risk for the village and small town population increased further because of increased rainfall and flooding. The aim of the study was to monitor drinking water disinfection by measuring significant indicators (free chlorine, coliforms and *E. coli*) in samples from villages in Stara Zagora region and to determine the health risk for the population. Water samples were taken according to protocol from water taps in 50 villages in Stara Zagora Municipality in March (during a period of heavy rainfall) and October 2014 (during a dry period). Levels of free chlorine were measured using HACH DR/850 colorimeter and compatible reagents. 100 mL samples were inoculated with the medium Readycult® Coliforms 100. The samples were incubated and *E. coli* were identified using Kovac's reagent. The results showed a significant rate of samples with deviation from the established norms for all measured indicators. In 63% of the samples the levels of free chlorine were below the recommended 0.3 mg/L. Only in 13% of the samples free chlorine was adequate to the established norm. In 9% of the samples were found coliforms and in 13% of the samples were determined *E. coli* above the acceptable norms (0/100 mL). Percentage of coliform and *E. coli* positive samples was much higher than the maximum of 5% recommended by the World Health Organization Guidelines. Samples taken during a dry period showed slightly higher rate of compliance than samples taken during the period of heavy rainfall. The results from the study proved unsatisfactory disinfection of drinking water in rural areas around Stara Zagora. Effective measures should be taken to ensure the safety of the water supply in the studied villages, especially during rainy periods.

**Key words:** *drinking water safety, rural areas, E. coli, free chlorine*

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**ГОСУДАРСТВЕННАЯ ПОЛИТИКА В ОБЛАСТИ ОБУЧЕНИЯ НАСЕЛЕНИЯ ПО ЗАЩИТЕ ПРИ ЧРЕЗВЫЧАЙНЫХ СИТУАЦИЯХ****Аннотация**

*Подготовка населения по защите при чрезвычайных ситуациях имеет существенное значение для снижения риска здоровью и жизни людей. Приоритетной деятельностью для защиты при чрезвычайных ситуациях является формирование государственной политики обучения населения, в том числе органов управления, учащихся, сил реагирования и добровольческих подразделений. Обучение на всех уровнях является важной частью комплекса превентивных мероприятий по снижению последствий бедствий. Динамика чрезвычайных ситуаций определяет необходимость в непрерывном процессе совершенствования и достижения большей эффективности в целостной системе обучения по защите при бедствиях, авариях и катастрофах.*

**Ключевые слова:** бедствия, защита при чрезвычайных ситуациях, обучение населения, государственная политика.

Slavova V.B.<sup>1</sup>, Dimitrova D.A.<sup>2</sup>, Ivanov V.A.<sup>3</sup>, Parashkevova B.M.<sup>4</sup>, Vasileva A.V.<sup>5</sup>, Platikanova M.S.<sup>6</sup><sup>1</sup>Assistant Professor, MD, Trakya University, Medical Faculty, Department "Neurology, Psychiatry and MDS", Section "Medicine of the disaster situations", Stara Zagora, Bulgaria<sup>2</sup>PhD, MD, Medical University of Sofia, Faculty of Public Health, Department "Preventive medicine", Discipline "Disaster medicine", Sofia, Bulgaria<sup>3</sup>Professor, MD, Trakya University, Medical Faculty, Department "Neurology, Psychiatry and MDS", Section "Medicine of the disaster situations", Stara Zagora, Bulgaria<sup>4</sup>Associate Professor, PhD, MD, Trakya University, Medical Faculty, Department "Social medicine and health care management", Stara Zagora, Bulgaria<sup>5</sup>Student, Trakya University, Medical Faculty, Stara Zagora, Bulgaria<sup>6</sup>Associate Professor, PhD, MD, Trakya University, Medical Faculty, Department "Hygiene, Infectious diseases and Epidemiology", Section "Hygiene and Ecology", Stara Zagora, Bulgaria**STATE POLICY FOR TRAINING THE POPULATION FOR PROTECTIVE ACTIONS DURING DISASTROUS SITUATIONS****Abstract**

*The readiness of the population for protection in emergency situations is essential to reduce the risk to life and health. Priority activities for protection in emergency situations are the formation of state policy for public education, including of governing structures, students, reaction forces and volunteers. Training at all levels is an important part of the complex events through which prevention is done in order to reduce the effects of disasters. Notwithstanding the achievements until now, new realities require a continuing process of improvement and achieving greater efficiency in the overall training activity in protection during emergency situations.*

**Keywords:** disaster, protection during disastrous situations, training of the population.

**Introduction**

Over the last few years data released from UN and WHO show that the scale and frequency of natural disaster have been on the increase. While the absolute number of major natural disasters in the world for 1975 was calculated to less than 80, in 2010 that number reached 400. These figures show that, for that period the increase was a bit more than fourfold. Climate change; the population growth, which increases the pressure on natural resources; together with the process of urbanization; industrial activities and the deteriorating state of the environment are claimed to be among the major factors contributing to the occurrence of disaster situations. Among other challenges are the ever increasing number of vulnerable states, facing the risk of instability or civil conflicts, as well as the threat of terrorist attacks (chemical, radiological, transport, etc.)

In cases of emergency of different character, scale and severity, extreme situations occur in the affected regions, in general terms and from a medical point of view. The suddenness of occurrence, as well as the sharp discrepancy between the necessary and the available means and capacity to deal with the aftermath of a disaster call for specific prior training and pre-planning of reaction schemes for public protection and provision of medical support in the centre of a disaster area.

According to data released from Fire Safety and Civil Protection Directorate, in Bulgaria the list of most frequent significant disastrous events is headed by road accidents, fires and industrial incidents involving harmful substances. The second place, in terms of frequency, is taken by heavy storms, snowdrifts, road-icing, heavy rain and flooding.

The population's preparedness for proper behavior, reaction and ability to give first aid in cases of disaster is of vital importance for diminishing the risk of life loss and adverse health effects of the people in the affected regions. Adequate preparation would guarantee timely and effective reaction in terms of providing help and protection to disaster victims.

## ИНФОРМИРАНост НА ТИЙНЕЙДЖЪРИТЕ ОТНОСНО СПИН И СЕКСУАЛНО ПРЕДАВАНИТЕ ИНФЕКЦИИ

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## AWARENESS OF TEENAGERS ABOUT AIDS AND SEXUALLY TRANSMITTED DISEASES

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**Резюме.** Извършен е анализ на резултатите от анкетно проучване сред ученици на възраст от 15 до 19 год. в четири града на област Стара Загора за периода 2011-2015 г., в рамките на Национална програма за превенция и контрол на HIV и сексуално предавани инфекции 2008-2015 г. Целта е да се установи нивото на информираност на младите хора за рисковете от заразяване, пътищата на разпространение на HIV/СПИН и сексуално предаваните инфекции (СПИ), и начините за предпазване от тях. Получените резултати показват, че тийнейджърите имат най-високи знания за СПИН и сифилис, добре познават пътищата на предаване на HIV, но знанията им за липсата на риск при битово общуване с хора, болни от СПИН, са задоволителни. Подрастащите (с малки изключения) са запознати с начините за предпазване от СПИ, което корелира с ниския процент на заразените. Голяма част съобщават за липса на полов живот, а при останалите възрастта за започването му е най-често 15-16 години. Информация по темата се получава главно от интернет. Получените резултати показват и определят необходимостта от прилагането на по-ефективни програми по сексуално образование в училищата за повишаване на здравните знания, нагласи и умения за безрисково сексуално поведение.

**Ключови думи:** СПИН, сексуално предавани инфекции, ученици, информираност, сексуално образование

**Summary.** An analysis based on the results from a survey done among students from age 15 to 19 has been carried out in 4 cities in the region of Stara Zagora for the period 2011-2015. The survey is an activity related to "The National Program for Prevention and Control of HIV and sexually transmitted infections 2008-2015". The aim is to determine the level of awareness of young people about the risks of contamination, the ways to spread HIV/AIDS and sexually transmitted diseases (STD) and how to prevent them. The results show that teenagers have high knowledge about AIDS and syphilis, they are aware how HIV can be transmitted. The case whether you can be contaminated with the virus while communicating show satisfying results. The adolescents, with a few exceptions, are aware how to protect themselves from STD, which is visible from the low percentage of contaminated people from the survey. A big number of them don't lead sex life, the rest start usually at age 15-16. The information on the subject is obtained mainly from the internet. The results show and determine the necessity of applying more effective programs on sexual education in schools to increase the health knowledge, attitude and skills for a riskless sexual behaviour.

**Key words:** AIDS, sexually transmitted diseases, students, awareness, sexual education

## АНАЛИЗ НА ЗДРАВΟΣЛОВНОТО СЪСТОЯНИЕ НА РАБОТЕЩИ ВЪВ ВЪГЛЕДОБИВНАТА ПРОМИШЛЕННОСТ

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## ANALYSIS OF THE HEALTH STATUS OF WORKERS IN THE COAL INDUSTRY

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### РЕЗЮМЕ

**Введение:** Експозицията на някои специфични рискови фактори за въгледобивната промишленост - шум, вибрации, прах, химични вещества и неблагоприятен микроклимат, обуславя патологията на заболяванията в този отрасъл. С настоящото проучване си поставихме за цел да направим анализ на резултатите от проведените през 2015 година профилактични прегледи на работещите в „Мини Марица Изток“ ЕАД.

**Материал и методи:** Изследвани са 5740 работници от дружеството от висококвалифициран медицински персонал (терапевт, пулмолог, невролог, офталмолог, оториноларинголог, акушер гинеколог). Проведена е анкета за проучване на рисковите фактори, свързани с начина на живот. Данните са анализирани чрез програмните продукти SPSS и EXCEL.

**Резултати:** В регистрираната патология преобладават заболяванията от клас VII „Болести на окото и придатъците му“ (34.87%). Клас „Болести на органите на кръвообращението“ (28.81%) са представени основно от артериалната хипертония, а за клас „Болести на костно-мускулната система“ (11.25%) водещи са уврежданията на междупрешленните дискове. Заболяванията са диагностицирани главно при работници на възраст над 45 години и с продължителен специализиран трудов стаж над 10 години. Рисковите фактори, свързани с начина на живот, за които работниците съобщават, са:

### ABSTRACT

**Introduction:** The exposure to certain specific risk factors of the coal industry - noise, vibration, dust, chemicals and adverse climate, determines the pathology of the diseases in this sector. With this study we aim to analyze the results from the conducted in 2015 health screening of workers at Mini Maritsa Iztok EAD.

**Materials and Methods:** The study included 5740 workers in the company and was conducted by highly qualified medical personnel (therapist, pulmonologist, neurologist, ophthalmologist, otorhinolaryngologist, gynecologist). A poll was used to study the risk factors associated with lifestyle. Data was analyzed using the SPSS software and EXCEL.

**Results:** In the registered pathology the prevalent diseases are Class VII - „Diseases of the Eye and Adnexa“ (34.87%). Class „Diseases of the Circulatory System“ (28.81%) was represented mainly by hypertension and for Class „Diseases of the Musculoskeletal System“ (11.25%) leading are injuries of the intervertebral discs. The diseases are diagnosed mainly in workers aged over 45 years and with a specialized work experience of over 10 years. Risk factors related to lifestyle, which workers report are: alcohol, tobacco and psycho-emotional stress.

**Conclusion:** The prevalence of socially significant diseases with multifactorial conditioning in the structure of morbidity in the coal industry shows the need for mandatory periodical checkups, with a coverage of a maximum number of insured.



употреба на алкохол, тютюнопушене и психоемоционално напрежение.

**Заключение:** Преобладаването на социално значимите болести с многофакторна обусловеност в структурата на заболяемостта във въгледобивната промишленост показва необходимостта от задължителното периодично провеждане на профилактични прегледи с обхващане на максимален брой осигурени.

**Ключови думи:** въгледобивна промишленост, здравословно състояние, медицински профилактичен преглед

## ВЪВЕДЕНИЕ

Стратегическата цел на националната здравна политика на всяка цивилизована страна е подобряване здравето на населението. Отговорност за това имат както държавните институции и законодателни органи, така и работодателите - с осигуряване на здравословни условия на труд, и самите граждани - с отговорност към собственото здраве. В изпълнение на тази отговорност са осъществяваните задължителни периодични профилактични медицински прегледи. Използването на данните от профилактичните медицински прегледи (т.нар. активен подход) е най-ефективният методичен подход, отразяващ нерегистрираната, скрита заболяемост.

Според действащото у нас законодателство анализът на резултатите от проведените профилактични прегледи, както и здравното наблюдение на работещите са част от задълженията на службите по трудова медицина като основни участници при осигуряването на здраве и безопасност при работа във всяко едно предприятие. Обобщени анализи от всяка служба се предават в регионалните здравни инспекции, но за съжаление информацията от тях не се обработва и съответно не служи за идентифициране на здравословните проблеми в отделните икономически отрасли. Това води до невъзможност за планиране и въвеждане на програми за промоция на здравето, за управление на здравния риск и съответно до подобряване на здравните показатели (3, 4, 5, 6, 7, 8).

„Мини Марица Изток“ ЕАД е едно от най-големите дружества за добив и пласмент на въглища, произвеждащо 90% от въглищата в страната (1, 2). Експозицията на някои специфични рискови фактори за въгледобивната промишленост - шум, вибрации, прах, химични вещества и неблагоприятен микроклимат, обуславя патоло-

**Keywords:** coal industry, health, medical checkup

гията на заболяванията в този отрасъл. С настоящото проучване си поставихме за цел да направим анализ на резултатите от проведените през 2015 година профилактични прегледи на работещите в „Мини Марица Изток“ ЕАД.

## МАТЕРИАЛ И МЕТОДИ

Изследвани са 5740 работници от екипи, включващи медицински специалисти с висока квалификация (терапевт, пулмолог, невролог, офталмолог, оториноларинголог, акушер гинеколог). За улеснение на осигурените профилактичните прегледи са проведени в близост до работните места.

Снета е професионална анамнеза относно общия и специализиран трудов стаж на работното място, характера на работния процес, режима на труд и почивка, настоящи и минали заболявания. Структурата на регистрираните общи заболявания е в съответствие с Международната класификация на болестите (МКБ - X ревизия) Получените резултати са отразени в „Карта за профилактичен преглед“, която е основен източник на информацията и са изготвени индивидуални електронни досиета на работещите. Използван е документално-персоналният метод, който осигурява полицей анализ на „моментната болестност“.

Проведена е анкета за проучване на рисковите фактори, свързани с начина на живот. Данните са анализирани чрез програмните продукти SPSS и EXCEL.

## РЕЗУЛТАТИ И ОБСЪЖДАНЕ

Броят на прегледаните работници при профилактичния преглед представлява 78.56% от общия брой лица (7306), работещи в „Мини Марица Изток“ ЕАД. От всички прегледани мъжете са 4840, което е 77.30% от подлежащите на пре-

## ХАРАКТЕРИСТИКА НА УСЛОВИЯТА НА ТРУД И СПЕЦИФИЧНИТЕ ФАКТОРИ, СВЪРЗАНИ С РАБОТНИЯ ПРОЦЕС ПРИ ДОБИВ НА ЛИГНИТНИ ВЪГЛИЩА ПО ОТКРИТ СПОСОБ

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## CHARACTERISTICS OF WORKING CONDITIONS AND FACTORS RELATED TO THE SPECIFIC WORKFLOW LIGNITE MINING IN AN OPEN WAY

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### РЕЗЮМЕ

Въгледобивът е отрасъл, известен с редица трудово-хигиенни проблеми и рискови за здравето условия на труд. Значението му е голямо, тъй като формира 40% от общото производство в минерално-суровинната индустрия. Целта на настоящото изследване е проучване на условията на труд и специфичните фактори, свързани с работния процес при добив на лигнитни въглища по открит способ. Голямото разнообразие от производствени и ремонтни дейности определя като водещи производствени вредности, на които са експонирани работниците от основните професии, да бъдат определени микроклиматът, шумът, вибрациите, прахът и химичните агенти. Въз основа на настоящата работа са разработени разнообразни по форма и съдържание мероприятия за оздравяване на трудовата среда, създаването на добри условия на труд и оптимална безопасност за здравето на работещите.

**Ключови думи:** условия на труд, фактори на работния процес, лигнитни въглища

### ABSTRACT

The coal mining industry is known for a number of occupational hygiene problems and health risks at work. Its importance is great, since it forms 40% of the total production in the raw mineral materials industry. The aim of this study is a survey of the working conditions and specific factors related to the production of lignite coal in surface mines. The wide variety of manufacturing and repairs defined the leading industrial hazards to which workers from major occupations are exposed to be microclimate, noise, vibration, dust and chemical agents. This work lead to the development of diverse in form and content activities for improving the work environment, creating better working conditions and optimum safety for workers' health.

**Keywords:** working conditions, workflow factors, lignite coal



**СОЦИАЛНО-БИТОВИ УСЛОВИЯ НА ЖИВОТ НА ВЪЗРАСТНИ ХОРА,  
ЖИВЕЕЩИ В ДОМОВЕ ЗА СОЦИАЛНИ УСЛУГИ НА ТЕРИТОРИЯТА НА  
ОБЩИНА СТАРА ЗАГОРА**

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(Резюме)

Социално-битовите условия на живот на възрастните хора, живеещи в домове за социални услуги са важен фактор за запазване на психическото и физическото им здраве. Неблагоприятните социално-битови фактори пораждаат здравно-хигиенни проблеми и затрудняват адаптацията на възрастните хора към живота в тези домове.

**Цел:** да се направи хигиенна оценка на материално-битовата и материално-техническата база на живот и обслужване.

**Материал и методи:** използван е чек-лист от проверка на домовете за социални услуги, предоставен от Министерство на здравеопазването. Резултатите са обработени с помощта на статистически методи: групиране на данните и продуктите на MS Office.

**Резултати и изводи:** Проучването включва 9 дома предлагащи социални услуги за възрастни хора на територията на община Стара Загора, от които 4 частни. Всички отговарят на съвременните хигиенни изисквания, осигуряващи здравно-хигиенен начин на живот. Съществува тясна връзка между качеството на живот на възрастните хора и условията в домовете. Направени са здравно-профилактични препоръки за оптимизиране на социално-битовата среда на живот, в съответствие с Националната стратегия на дългосрочна грижа на Р. България.

**Ключови думи:** възрастни хора, социално-битови условия на живот

# МЕДИЦИНСКИЕ НАУКИ

## OCCUPATIONAL-HYGIENE PROBLEMS IN AGRICULTURE

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## ПРОБЛЕМЫ ЧЕЛОВЕЧЕСКОГО ГИГИЕНА В СЕЛЬСКОМ ХОЗЯЙСТВЕ

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### SUMMARY

The main occupational-hygiene problems in agriculture are physical workload and high labor intensity, physical factors such as noise, vibration, dust, working outdoors, microclimate and very high or low temperatures, chemical factors (mainly the use of pesticides), biological (direct contact with animals), irregular working hours and a big distance from the workplace, psychological factors. All of them give rise to diseases in the human body and psycho-social problems.

### АННОТАЦИЯ

Основными трудовыми и гигиеническими проблемами в сельском хозяйстве являются физическая нагрузка и высокая трудоемкость, физические факторы, такие как шум, вибрации, пыль, работа на открытом воздухе, микроклимат и слишком высокие и низкие температуры, химические факторы (в основном использование пестицидов), биологический (прямой контакт с животными), неправильное рабочее время и дистанция от рабочего места и психологические факторы. Все они приводят к возникновению болезней в организме человека и психосоциальным проблемам.

**Keywords:** occupational-hygiene problems, agriculture

**Ключевые слова:** проблемы труда и гигиены, сельское хозяйство

Agriculture is one of the main sectors in the economics of one country. A part of it is the production of plants and animal raw materials and it has a key role for the development of social-economic situation of the country and to the feeding of the population. With modernization and mechanization of agricultural work in recent years occurred more major changes in the nature and conditions of work. However, agricultural work is characterized by a number of specific occupational-hygiene problems. In recent years, agriculture has begun to be defined by many authors as one of the hazardous sectors of production, as workers in this environment are exposed to a large number of health-damaging factors unlocking different types of disease, and there is a risk of fatal or non-fatal occupational accidents [22, p. 3, 26, p. 2331].

Among the main occupational-hygiene problems in agriculture is physical workload and high intensity of work on which are exposed workers. Although the majority of operations in agriculture and livestock are mechanized, manual operations can not still be fully replaced. This is the cause for complaints from the mus-

culoskeletal system - back pain in over 50% of agricultural workers, pain in shoulders at over 30% and in knees - at around 20% [11, p. 2576]. These results demonstrate the serious adverse effects of hard physical labor on workers' health.

Work in agriculture is associated with irregular work hours. The load is higher at certain times of the year (eg. sowing in farming, sheep shearing in livestock breeding) and is dependent on seasons and circadian rhythm. In farming and livestock breeding, working day does not correspond to physiological rhythms and norms for healthy work as it is extended. This creates prerequisites for the occurrence of health problems [6, p.420, 14, p.415, 19, p. 203]. Unfavourable factors are the big distance of the workplace, from the place of residence, which further impairs the proper rotation of work and break. This is related to additional fatigue and energy expense due to increased transport traumatism [8].

According to nature of agricultural work, it is clear that its main feature is the work outdoors. That is why the meteorological factors have a direct impact on workers. There are a lot of cases of overheating and

## КАЧЕСТВО НА ЖИВОТ В ДОМОВЕ ЗА СОЦИАЛНИ УСЛУГИ ЗА ВЪЗРАСТНИ ХОРА

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## QUALITY OF LIFE IN NURSING HOMES

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**Резюме.** Поддържането на високо качество на живот е от изключителна важност за хората, живеещи в домове за социални услуги. В материала са разгледани и са систематизирани факторите, които имат отношение към осигуряването му. Оценката на качеството на живот се извършва въз основа на материалната база, мнението на жителите в домовете, грижите, полагани от персонала за здравословното състояние на възрастните хора, смъртността в домовете и начинът, по който те се управляват. Всички тези фактори, тясно свързани помежду си, пряко или косвено определят качеството на живот. С помощта на прегледаната литература се установява, че съществуват неблагоприятни фактори в домовете за социални услуги за възрастни хора в различни аспекти, които повлияват негативно физическото и психичното здраве на жителите в тези институции. Разгледани са някои стратегии за оптимизиране живота на възрастните хора в домовете. Прегледани са съвременни практики за подобряване качеството на живот, приложени в различни страни през последните години, от които е получен положителен резултат.

**Ключови думи:** качество на живот, домове за социални услуги, възрастни хора

**Abstract.** Maintaining a high quality of life is very important for people living in nursing homes. This article reviews and systematizes the factors that are relevant to its provision. The quality of life is assessed on the material base, the opinion of the residents in the homes, the care taken by staff on the health status of the elderly, the mortality in the homes and the way they are managed. All these factors, closely related to each other, directly or indirectly determine the quality of life. With the help of the reviewed literature it is found that there are unfavorable factors in the nursing homes for the elderly in different aspects, which negatively affect the physical and mental health of the residents in these institutions. The presented paper examines some strategies for optimizing the life of elderly people in the homes. Different practices for improving the quality of life are reviewed. They have been applied in different countries in recent years and have yielded a positive result.

**Key words:** quality of life, nursing homes, elderly people

Старееенето е естествен процес, съпътстващ живота на индивида. Всеки човек има право достойно да изживее и да завърши живота си. До голяма степен този завършек се определя от качеството на живот в домовете за социални услу-

ги за възрастни хора, които са неизменна част и необходимост, независимо от стандарта и начина им на живот.

Прегледът на литературата дава достатъчно доказателства, че за благополучието на възраст-





## HEALTH PROBLEMS AT OPERATORS OF ELECTRIC SUBSTATION WORKING IN COAL INDUSTRY

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**Abstract:** *Within the framework of the coal mining industry, of interest is the activity of the operators of electric substations, ensuring the security of power supply in the mines' territory.*

*The work of the electric substations is characterized by a considerable load of the visual analyzer, continuous sitting position with static shoulder strain, psycho-emotional workload, 12- hour work shifts, night shifts.*

*With this study, we set the purpose to analyze the current disease in the electric substation operators. The main indicators which were followed are: scope of prophylactic examinations, relative share of patients, structure of the momentary morbidity.*

*A link between the observed deviations in health status and the working environment factors has been sought, as well as the harmful habits.*

**Key words:** *operators of electrical substations, mining industry, momentary morbidity, working conditions.*

### Introduction

Mining industry in Bulgaria is a structural sector and one of the main engines of the state economy. In this sector our country most closely resembles as labor productivity to the average of European Union, which significantly exceeds the average performance of other industries. The number of workers, particularly in the sub-sector - coal mining, is large. Due to these facts, one of the priorities of our country is their health. Early detection of health problems and risk factors that determine them, create favourable conditions for its preservation and recovery. To assess the health status of workers in this sub-sector (coal mining), it is necessary to examine the impact of harmful factors in the work environment on the development of occupational diseases and work accidents (1,2,3,4,8,17). Employees in good health are more productive and more highly motivated. Their good health leads to reduced absences and disruptions in the work process (5,7,9).

Within the mining production of interest is the health of the operators of electric substations as their main activity is providing electric energy on the territory of mines.

The purpose of this study is to analyze the current morbidity in operators of electric substations. The main indicators are tracked - scope of preventive examinations, relative share of sick persons, structure of current morbidity. A link between the identified deviations in health status and work environment factors and harmful habits is sought. Based on the results are suggested remedial measures to protect the health of workers.

## МЕТОДИКИ ЗА ИЗВЛИЧАНЕ И ОПРЕДЕЛЯНЕ НА КАНЦЕРОГЕННИ ХЕПАТОТОКСИНИ НА СИНЬО-ЗЕЛЕНИТЕ ВОДОРАСЛИ ОТ ВОДИ И БИОМАСА

Павлова В., М. Митрева, НЦОЗА

Микроцистините са канцерогенни хепатотоксини, продуцирани от някои видове синьо-зелени водорасли, известни още като цианобактерии. За тях Световната здравна организация препоръчва максимално допустима стойност в питейни води 1 µg/l, а във води за къпане - 20 µg/l. Разработените методики за извличане показват високи стойности на аналитичния добив при използване на 6 мл картриджи за твърдофазна екстракция Oasis, Waters и екстракционни дискове Empore Extraction Disks C18, 3M, Supelco – средно 102% при картриджи и 91 % при дискове. По-краткото време за екстракция на проба, възможността за двукратно и трето ползване на екстракционните дискове и съизмеримата им цена с тази на картриджите ги прави по-целесъобразни за употреба. Извличането на микроцистини от биомаса показва, че първата екстракция може да се счита за достатъчна. За дълбочаването на проблемите с еутрофикацията на водоемите е предпоставка за все по-масивни цъфтежи на микроводорасли, сред които и токсин продуциращите цианобактерии. Ето защо методите за определяне на цианотоксини стават все по-актуални, включително и в България.

**Ключови думи:** цианотоксини, цианобактерии, микроцистини

## ЕТИЧНИ, КУЛТУРНИ И РЕЛИГИОЗНИ АСПЕКТИ НА ОБЩУВАНЕТО В ПРЕВАНТИВНАТА ДЕЙНОСТ ПРИ МЕДИЦИНСКИТЕ ПРОФЕСИИ

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Обучението по здравните професии е МВУ е съобразено с изискванията на Медицинската етика, която присъства като задължителна учебна дисциплина в учебните планове на всички специалности от професионалните направления „Медицина“, „Здравни грижи“ и „Обществено здраве“. Медицинските дейности, включително и превантивните, налагат общуване с пациента (клиент) и спазване принципите на Медицинската етика.

Целта на настоящото проучване е: Да се установят основните изисквания, и етичните принципи, които медицинските специалисти са длъжни да спазват при общуването с пациентите, свързани с техните професионални задължения вкл. и превантивните дейности.

**Материал и методи:** Основните методи на изследването са анализ на учебна документация, интервю със студенти медици и от професионално направление здравни грижи; преподаватели и наставници от клиничните бази за обучение.

**Резултати и обсъждане:** Изследването показва, че за медицинските професии е задължително спазването на етичните принципи при упражняване на професията и при общуването с пациентите и техните семейства, при реализиране на професионалните им дейности. Зачитането на пациента като личност, прилагането на холистичния подход в процеса на лечебно-диагностичните дейности и цялостното обгрижване на пациента е основно задължение на медицинските специалисти.

**Заклучение и изводи:** При съвременните условия и засилените миграционни процеси се наблюдават значителни културни и религиозни различия на пациентите и вътре в медицинските екипи, което обуславя необходимостта от уважаване на различните култури и ценности при упражняване на медицинската професия.

**Ключови думи:** етични принципи, културни различия, ценности, медицинска професия, задължения, миграция, пациенти



- фактори от болничния бит;
- фактори на междуличностно общуване.

2. Съотношението между факторите, обуславящи пациентската удовлетвореност, се променя във времето и носи времево детерминирана информация, която успешно може да служи за управленски решения. Това доказва необходимостта от системно провеждане на проучвания върху удовлетвореността на пациентите и по-голямо внимание към прилаганите при тях методически подходи.

**Ключови думи:** удовлетвореност на пациентите, детерминанти, подходи за измерване, качество

## ГЛОБАЛНАТА ИКОНОМИЧЕСКА ТЕЖЕСТ НА ДИАБЕТА

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**Въведение:** Захарният диабет (ЗД) е заболяване с огромен ефект за социално-икономическото развитие на страните, определено от продължителното му протичане, причиняване на инвалидизация, нарушаване способността на хората за ежедневни дейности и водещото му място сред причините за смъртност.

**Материали и методи:** Анализ на данни от Проучване върху глобалната тежест на заболяванията 2015; Глобален доклад за диабета на СЗО, 2016.

**Резултати:** ЗД е една от тридесетте водещи причини за загуба на години живот, оценени с YLLs и DALYs. Най-значително е повишаването на ранговия номер на диабета, при оценяване тежестта на заболявания с DALYs, като 1990-2005 се повишава с 65,1%, а 2005-2015 – с 29%. Според СЗО директните разходи за захарния диабет в световен мащаб са повече от US\$827 милиарда, като за 2003-2013г. разходите са се утроили. Международната федерация по диабет оценява цената на ЗД за здравните системи на около 548 милиарда долара през 2013 г., като прогнозите за 2035г. са да се увеличи до 627 милиарда.

**Заклучение:** Голямата икономическа тежест на захарния диабет е свързана не само с икономическата тежест върху здравните системи и националните икономики, но и с тежестта на преките плащания от самите болни и техните семейства, както и със значителни загуби на доходи поради увреждания и преждевременна смърт.

**Ключови думи:** захарен диабет, разходи, тежест

## РОЛЯ НА МЕДИЦИНСКИТЕ ЕКИПИ В БЪЛГАРИЯ ПРИ РЕШАВАНЕТО НА ОСНОВНИТЕ МЕДИКО-СОЦИАЛНИ ПРОБЛЕМИ НА ГЕРИАТРИЧНИ ПАЦИЕНТИ

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**Цел:** Целта на настоящото проучване е да се определи ролята на медицинския екип при решаването на редица медико-социални проблеми на гериатрични пациенти и в осигуряването на качествени здравни грижи.

**Материал и методи:** Основните методи, които използвахме за изпълнение на поставената цел са наблюдение от страна на медицинските екипи и на гериатрични пациенти и последващо интервю с медицински специалисти, относно проблемите в медицинско и социално естество на тези гериатрични пациенти.

**Резултати и обсъждане:** Медицинските екипи са основни участници в процеса на обгрижването на гериатричните пациенти. На базата на своите професионални компетенции те участват не само в медицинските грижи за възрастните хора, но и в психична-



та и социална подкрепа на хората в третата възраст.

**Заключение и изводи:** Във връзка с проучването на основните медико-социални проблеми при старите хора е необходимо разработване на комплексна превантивно ориентирана програма за медико- и психо-социална гериатрична помощ в България с няколко приоритета:

- съхраняване на доброто психическо и физическо здраве на възрастните хора чрез превенция;
- ранно откриване и интервениране на психически упадък, деменции;
- минимализиране на инвалидността и съхраняване на автономността на възрастните хора чрез подкрепяща мрежа от услуги на базата на индивидуалните потребности на пациента.

**Ключови думи:** медицински екипи, гериатрични пациенти, медико-социални проблеми

## ПРОМОЦИЯ НА ЗДРАВЕТО – ИНОВАТИВЕН ПОДХОД ЗА ПОДОБРЯВАНЕ НА ОБЩЕСТВЕННОТО ЗДРАВЕ

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**Въведение:** Концепцията за промоция на здравето днес е по-актуална от всякога, защото здравната система понася тройна тежест от инфекциозните, хроничните неинфекциозни заболявания и нарастващият травматизъм, като причини за преждевременна смърт и загубени години продуктивен живот (DALYs). Целта на настоящото съобщение е да анализира детерминантите на здравето и ефекта от прилагане на принципите на промоцията на здравето за контрол върху тях.

**Материали и методи:** Библиографска справка и критичен анализ на литературни източници, интернет сайтове и бази данни на СЗО.

**Резултати и обсъждане:** Свидетели сме на парадокса, че явления, които съпътстват общественото развитие, като глобализация, урбанизация, съвременни технологии, довеждат до влошаване на редица здравни показатели. Контролът на факторите на здравето не винаги е в компетентностите на здравната система, което определя нови приоритетни сфери на дейност, насочени към интегрален подход към здравето, лична и обществена отговорност и междусекторно сътрудничество за неговото формиране. Чрез адекватни обществени мерки 80 % от сърдечно-събови заболявания и диабета, както и 40% от заболяемостта от злокачествени новообразувания може да бъде предотвратена. Принципите на промоция на здравето стават все по-широко приложими в конкретна среда за оптимизиране функционирането на общността в населените места, на работното място, в училище и здравните заведения.

**Заключение:** Съществуват все повече доказателства, че прилагане на принципите на промоция на здравето, при отчитане на конкретните условия на развитие на страните и общностите, е високоефективен подход за подобряване на общественото здраве.

**Ключови думи:** промоция на здравето, социално значими заболявания, съвременни технологии

## СТРЕСЪТ В ЕЖЕДНЕВИЕТО НА ОБЩОПРАКТИКУВАЩИЯ ЛЕКАР

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## STRESS IN THE DAILY LIFE OF GENERAL PRACTITIONER

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**Резюме.** През последните години стресът сред общопрактикуващите лекари (ОПЛ) е все по-често срещано явление. Той се обуславя от редица фактори, като огромно натоварване поради големия брой консултации с пациенти, малко време за почивка, неудовлетворение от работата във връзка със заплащането и неуредиците в системата на здравеопазването. Стресът оказва влияние както върху желанието на семейните лекари за работа и пълноценното ѝ изпълнение, така и върху физическото и психичното им здраве. В много случаи се стига до цялостна промяна в стила на живота на лекарите – придобиване на вредни навици (употреба на алкохол, тютюнопушене, нездравословно хранене), което от своя страна също рефлектира върху здравето им. Прегледът на литературата показва, че стресът в ежедневието на общопрактикуващия лекар формира „порочен кръг“. Това определя необходимостта от въвеждане на нови стратегии за преодоляване на напрежението с цел постигане на по-голяма резултатност и успех в диагностично-лечебния процес на семейните лекари.

**Ключови думи:** общопрактикуващ лекар, стрес, стратегии, напрежение

**Abstract.** In recent years, stress among general practitioners (GPs) has become more common. It is caused by a number of factors, such as heavy workloads due to the large number of consultations with patients, little rest, pay-related dissatisfaction and problems in the healthcare system. Stress has an impact both on the desire of family doctors to work and their full performance as well as on their physical and mental health. In many cases, there is a complete change in general practitioner's lifestyle – the acquisition of harmful habits (use of alcohol, smoking, unhealthy feeding) which also affects their health. The review of literature shows that stress in general practitioner's daily life forms a „vicious circle.“ This determines the need from establishment of new strategies for overcoming tension in order to achieve greater efficiency and success in the family doctor's diagnostic-healing process.

**Key words:** general practitioner, stress, strategies, tension

comparison to normotensive Wistar rats, in control, non-treated SHR the GSH level and the activity of GPx and AChE were lower, while the activity of CAT and SOD, as well as the level of MDA were higher in the brain. Compared to the control SHRs, LECV exerted antioxidant activity, discerned by statistically significant increased activities of all measured antioxidant enzymes and decreased production of MDA. The AChE activity remained unchanged. The observed effects on tissue level were consistent with the histopathological observations of the brain.

Based on the results of our study we could conclude that the lyophilized extract of *Clinopodium vulgare* showed antioxidant potential in the brain of spontaneously hypertensive rats – a model of essential hypertension in humans.

## NEUROTOXICITY OF SOME HEAVY METALS - LEAD, MERCURY, MANGANESE

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A lot of heavy metals have a toxic effect on the central (CNS) and peripheral nervous system (CNS). Contamination of various ecological systems with heavy metals, especially food products, is a prerequisite for their entry into the body and damage to the nervous system. Heavy metals are toxic for humans over the doses of the acceptable concentrations.

It has been found that heavy metals, such as lead, mercury and manganese, pass through the hematoencephalic barrier easily and that defines their effects on the CNS and the PNS. The most common



disorders they cause in the CNS are various brain damages, reduced neurophysiological functions and brain tumors. Data suggest that changes in PNS due to elevated concentrations of heavy metals in the blood are: abnormal movements and reflexes, peripheral neuropathies, polyneuritis.

According to a large number of authors, the easy passage of lead through the haematocephalic barrier is mainly due to its ability to replace calcium ions. Lead leads to damage to the prefrontal cortex, hippocampus and cerebellum, resulting in various neurological disorders.

Mercury also disturbs the normal development processes in human brain seriously. It has a high binding affinity to the element selenium found in proteins that protect cells from damage by free radicals. By associating with selenium, mercury blocks this chain of defense processes, which explains why it is neurotoxic even at low doses.

It has been proven that the brain is extremely sensitive to excess manganese and this leads to the neurodegenerative diseases, one of which is known as manganism. An important characteristic of the disease are parkinson-like symptoms. It is considered that the common between the two diseases is that manganese is mostly accumulated in the basal ganglia and this is the etiology of both diseases.

The examined heavy metals disrupt the structures and functions of the CNS and the PNS through different mechanisms which is a result from their neurotoxicity.

# Mathematical Model for Forecasting the Influence of Atmospheric Pollution on Population Morbidity in Stara Zagora Municipality (Bulgaria)

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## Abstract

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Keywords: Atmospheric pollution; Morbidity; Mathematical model; Atmospheric pollutants; PM<sub>10</sub>

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**AIM:** This paper aims to create a mathematical model for forecasting the morbidity of the population in the Republic of Bulgaria and the Stara Zagora Municipality in particular as a consequence of the atmospheric pollution.

**SUBJECTS AND METHODS:** This model is based on a formula which determines the correlation between the average annual concentrations of atmospheric pollutants SO<sub>2</sub>, PM<sub>10</sub>, Pb aerosols, NO<sub>2</sub> and H<sub>2</sub>S) and the morbidity of the population based on the number of people who visited their GPs in a relation with a chronic health problem or emergency condition and the number of hospitalisations in two age groups (newborn to 17 years olds and 18 and older) as well as for the entire population in the period 2009-2013, making it possible to predict morbidity levels.

**RESULTS:** The expected morbidity level predictions based on the number of people who visited their GPs in Municipality are lower, while hospitalisation level predictions are higher. This model has been created and tested and is applicable in all residential areas.

**CONCLUSIONS:** A new, very sensitive, mathematical model has been created and tested (average margin of error from 0.61% to 2.59%) and is applicable in all residential areas.

## Introduction

Stara Zagora Municipality is situated in the central part of South Bulgaria, in the Upper Thracian Plain, on the south hills of Sredna Sarnena Gora mountain (N 42° 25', E 25° 37'). It covers an area of 1019.1 square km and is located at 240 m above sea level. It comprises 52 towns and villages with a total of 156,662 residents, 137,834 of whom live in the city of Stara Zagora. Stara Zagora Municipality is amongst the most industrially developed municipalities in Bulgaria, which is the main cause of air, water and soil pollution. One of the key threats to public health associated with the environment in Stara Zagora is

atmospheric air pollution. Its protection is governed by the Clean Air Act [1] as well as by its associated regulations – Regulation No. 14/1997 [2]; Regulation No. 11/2007 [3]; Regulation No. 12/2010 [4], where all Bulgarian rules and regulations are harmonised with those of the EU (Directive 2008/50/EC). Atmospheric air quality monitoring and control are carried out throughout the year by the Regional Inspectorate of Environment and Water Directorate.

In the past 20 years, the atmospheric air in Stara Zagora Municipality has been amongst the most polluted in the country [5] [6] [7]. The atmospheric air quality in the municipality is contingent upon the operation of numerous local (industrial enterprises, domestic heating, heavy traffic) and regional (the

## Serum Markers of Iron Metabolism in Chronic Liver Diseases

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Keywords: Steatosis; Serum ferritin; Serum iron; Transferrin saturation; Chronic liver disease

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**BACKGROUND:** Disorders in the metabolism of iron in the direction of iron overload are observed not only in primary hemochromatosis but also in some chronic liver diseases other aetiology. Elevation of serum iron, ferritin and transferrin saturation is reported in nonalcoholic fatty liver disease and alcohol, chronic hepatitis C and liver cirrhosis.

**AIM:** Aim of the study was to evaluate and compare the frequency of the iron serum markers in patients with various chronic liver diseases.

**MATERIAL AND METHODS:** The study included a total of 246 persons -186 patients with chronic liver disease without cirrhosis (-115 men, women -71; average age of  $50.41 \pm 12.85$ , from 23 to 77 years) and 60 healthy controls (-30 men, women -30, middle-aged  $50.50 \pm 11.31$ , from 29 to 83 years). Medical history, physical examination and demographic data including height, weight, laboratory and instrumental studies were performed.

**RESULTS:** The highest incidence of elevated serum iron, transferrin saturation and ferritin and decreased serum hepcidin found in cases of alcoholic liver disease (ALD), nonalcoholic fatty liver disease (NAFLD) and chronic hepatitis C (CHC).

**CONCLUSION:** Finally, analysis of the changes in serum markers of iron metabolism shows that the difference between healthy and sick with liver disease is primarily due to changes in alcoholic and nonalcoholic fatty liver disease, particularly steatohepatitis, and chronic hepatitis C.

## Introduction

The liver is an important organ for the homeostasis of the iron. Reticuloendothelial macrophages and hepatocytes are the main depots more than iron. In the liver is performed the synthesis of the hormone hepcidin and thus it became the central authority for the regulation of the body's reserves of iron [1] [2] [3].

Disorders in the metabolism of iron in the direction of iron overload are observed not only in primary hemochromatosis but also in some chronic liver disease with another aetiology [4] [5] [6] [7]. Increases in serum levels of iron, ferritin, and transferrin saturation are reported in nonalcoholic fatty liver disease and alcoholic fatty liver disease, chronic hepatitis C and liver cirrhosis [8] [9] [10] [11] [12] [13].

In recent years, there accumulated a lot of new data, some of them contradictory, about the clinical significance of serum parameters of iron

metabolism as surrogate markers of siderosis and severity of liver disease [8] [10] [14] [15] [16] [17]. There remain open questions regarding the clinical significance of serum parameters of iron metabolism and hepcidin in various chronic liver diseases and the role of some genetic factors and environmental factors for organic liver damage during overload syndrome iron.

The study aimed to evaluate and compare the frequency of the iron serum markers in patients with various chronic liver diseases.

To implement the above objective we set ourselves the following tasks:

1. To evaluate the change of serum parameters of iron metabolism in patients with the chronic liver disease compared to healthy subjects
2. To carry out comparative serum markers of iron metabolism in various chronic liver diseases





## ГЛЕДНА ТОЧКА НА СТУДЕНТИ МЕДИЦИНСКИ СЕСТРИ ЗА КАЧЕСТВОТО НА ПРЕПОДАВАНЕ ПО ХИГИЕНА И ЕКОЛОГИЯ

Магдалена Платиканова

### POINT OF VIEW OF NURSING STUDENTS FOR THE QUALITY OF TEACHING IN HYGIENE AND ECOLOGY

Magdalena Platikanova

**ABSTRACT:** *The theoretical and practical teaching in Hygiene and Ecology should be continually developed and updated to be as useful and adequate as possible for nursing students. The purpose of this study is to examine the perspective for nursing students on the quality of teaching in the discipline. The analysis of the results shows that lectures and exercises on "Hygiene and Ecology" arouse interest in students who believe and rely on their teachers to gain new knowledge in the specific field. It is the competence and responsiveness of lecturers and assistants that lead to positive results of the semester examination. The obtained knowledge from the nurses is the basis for their further improvement and validation as specialists in this field.*

**Key words:** *hygiene, ecology, teaching*

#### Въведение

Хигиената е научно-практическа профилактична медицинска дисциплина с голямо социално-икономическо значение. Чрез нея се цели да се запази и подобри здравето на индивида и неговото потомство, да се съхрани и увеличи работоспособността и творческото дълголетие на хората. Хигиената е нова наука в съвременен смисъл и същевременно един от най-древните дялове на човешкото познание и практика, свързани с медицината. Заедно с близката до нея наука екология спомогат за запазване и подобряване на здравето [11]. Именно придобиването на знания по тези дисциплини, формиращи профилактично мислене обуславят изучаването им в общ предмет от студентите от професионално направление „Здравни грижи“.

Цел на настоящото изследване е да се проучи гледната точка на студенти медицински сестри за качеството на преподаване по Хигиена и екология. Откриването на нагласите и предпочитанията на респондентите ще спомогнат за оптимизиране на учебния процес по тази дисциплина.

#### Материал и методи

Анкетиран са 41 студенти от Медицински факултет, Тракийски университет, Стара Загора специалност „Медицинска сестра“ – II курс. Използвани са две преки анонимни анкети. Едната включва мнението на медицинските сестри за преподаването на теоретичния материал по 11 показателя, а другата анкета съдържа 14 пункта свързани с практическото обучение по „Хигиена и екология“. Отговорите в анкетните карти са тип Ликертова скала, в която медицинските сестри чрез отговора си от 1 до 5 могат да се съгласят или да не се съгласят в различна степен. Данните са обработени с помощта на статистически методи.

#### Резултати и обсъждане

Обучението по всяка една дисциплина е свързано както с развитието на отделния индивид, така и с развитието на човешкото общество. Съобразено е със световните съвременни тенденции за хуманизация и глобулизация на обществото. В своята същност представлява реализиране на дейностите „препо-



## РИСКОВИ ФАКТОРИ В ЕЖЕДНЕВНАТА ДЕЙНОСТ НА ПРЕПОДАВАТЕЛИ В СФЕРАТА НА ОБЩЕСТВЕНОТО ЗДРАВЕ И ЗДРАВНИТЕ ГРИЖИ

Магдалена Платиканова, Петя Христова

### RISK FACTORS IN THE DAILY ACTIVITIES OF LECTURERS IN PUBLIC HEALTH AND HEALTH CARE

Magdalena Platikanova, Petya Hristova

**ABSTRACT:** *The everyday activity of each individual is accompanied by the effects of various factors that have a positive or negative impact on his health and self-esteem. The problem of positive workers' health is a key priority under the National Health Strategy 2014-2020, which as an important aspect of the country's policy is inextricably linked to ensuring healthy and safe working conditions and a good workplace psycho-climate.*

*The aim and objectives of the article is to examine the risk factors in the work of lecturers in the field of public health and health care. Some behavioural factors have been studied, depending on their lifestyle.*

*A documentary method has been used to analyze available literature, to study regulatory documents, programs and strategies in the field of health and safety at work in the healthcare sector and published and introduced good practices.*

*Some of the risk factors are related to the working environment (noise, illumination, microclimate, etc.) and others are the so-called behavioural factors (determined by the way of life). Their combined effect determines the professional pathology in the professors (neuritis, diseased of eye analyzer and skeletal-muscular system). Lecturers' lifestyle (irrational and unbalanced eating, low motor activity, harmful habits - alcohol and smoking) increase the risk of cardiovascular disease, diabetes and obesity. The nature of work and working conditions are directly related to the psycho-emotional stress of lecturers, which sometimes leads to emotional exhaustion and exhaustion.*

*The implementation of a set of preventive measures for rehabilitation of the working environment and the provision of good health, the use of the experience of good practices in the sphere of healthcare and education leads to improvement of the working conditions and the psycho-climate. It has a positive effect on the self-esteem and the satisfaction of the lecturers in the sphere public health and health care, and contribute to improving the educational environment.*

**Key words:** lecturer, risk factor, public health, health care

#### Въведение

В своята ежедневна дейност всеки човек, в частност преподавателите в сферата на общественото здраве и здравните грижи са подложени на въздействието на различни фактори, които оказват положително или отрицателно влияние върху здравето му състояние. Факторите, които влияят негативно върху здравето и повишават вероятността от възникване на заболяване се наричат рисков фактори. Тяхното въздействие се проявява при неспазване на здравните норми и изисквания [29].

Според критериите на СЗО, за да се приеме даден фактор за рисков е необходимо да се докаже неговата връзка с вероятността от възникване на заболяване, т.е. той да предшества болестта, да има биологично обяснение и след коригирането му, промените в крайния изход от неговото въздействие да са трайни. Това се потвърждава и от Борисов и съавтори, според които "рисковият фактор е такъв признак или елемент от жизнената и работната среда на човека, който създава условна вероятност за възникване на една или друга болест". Все по наложително става изискването да се отчита и изследва съчета-

## ХРАНИТЕЛНИ НАВИЦИ И ФАКТИЧЕСКО ХРАНЕНЕ НА ОБЩОПРАКТИКУВАЩИЯ ЛЕКАР

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## EATING HABITS AND ACTUAL NUTRITION OF THE GENERAL PRACTITIONER

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**Резюме.** Настоящото проучване включва оценка на индивидуалните хранителни навици, избора на хранителни продукти и модела на хранене на общопрактикуващи лекари (ОПЛ) от Старозагорска област. С пряка пощенска анкетна карта са изследвани 63-ма лични лекари. С помощта на индекса на телесна маса е определен антропометричният им статус. Анализът на резултатите показва съществени пропуски в хранителното поведение (липса на навици за прием на сутрешна закуска, ниско ниво на консумация на плодове и зеленчуци, превес на тестени храни и захари в менюто и др.). Това определя необходимостта от изграждане на здравословен модел на хранене при общопрактикуващия лекар, като залог за дълготрайна промоция на здравето и дееспособността му, а също и за превенция на болестите, свързани с нерационалното хранене.

**Ключови думи:** ОПЛ, хранителни продукти, хранителни навици, режим на хранене

**Abstract.** The study includes an assessment of individual eating habits, food choices, and a nutrition model of general practitioners (GPs) from the region of Stara Zagora. Using a direct mail questionnaire, 63 GPs were examined. The anthropometric status has been determined using the body mass index. The analysis of the results shows significant omissions in nutritional behavior (lack of breakfast, low consumption of fruits and vegetables, predominance of pasta and sugars in the menu, etc.). This determines the need to build a healthy eating model in GPs as a pledge for long-term health promotion and efficiency, as well as for the prevention of diseases related to irrational nutrition.

**Key words:** GPs, food products, eating habits, diet

Храненето на човека е рационално, правилно и оптимално, когато адекватно покрива в количествено и качествено отношение неговите физиологични потребности от хранителни вещества и енергия. То е най-контролируемият рисков фактор, който засяга дългосрочното здраве и играе съществена роля в етиологията на много заболявания, като исхемична болест на сърцето, атеросклероза, инсулинозависим захарен диабет, канцерогенни заболявания и др. [10, 11]. Рационалното

хранене осигурява постоянство на хомеостазата на организма и поддържа нормалното ниво на жизнените процеси – растежа, развитието, функцията на органите и системите. То регулира и моделира не само обменните процеси, но и реактивността на организма към постоянно изменящите се условия на труд и бит, и по-специално – към многобройните и разнообразни фактори на работната среда [8]. Разнообразното хранене включва ежедневен прием на различни продукти от живо-



## ОТНОСНО НЯКОИ ПРОБЛЕМИ ОТ МЕДИЦИНСКО И СОЦИАЛНО ЕСТЕСТВО ПРИ ОБГРИЖВАНЕ НА ГЕРИАТРИЧНИ ПАЦИЕНТИ ПРЕЗ ПОГЛЕДА НА ЗДРАВНИЯ РАБОТНИК

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**Резюме.** Здравните работници са основни участници в процеса на обгрижване на гериатричните пациенти, като осигуряват както медицинска помощ, така и социален и психичен комфорт на възрастните хора. Според тях актуалността на проблемите от медицинско и социално естество при полагане на здравни грижи при този контингент е свързана с множествена патология, затруднено речеве общуване за възприемане и спазване на назначенията, непостоянство в желанията и капризност, забавеност в разбирането, сензорни и паметови нарушения, промени в психиката и поведението, обусловени от възрастта. Недостигът на добре обучен персонал, големият обем административна работа и манипулации водят до липса на време за осъществяването на конкретните професионални задължения и за общуване с възрастния пациент. Това допълнително затруднява работата на здравния работник при обгрижването на гериатричните пациенти на фона на специфичните им здравословни проблеми. Именно медико-социални проблеми при старите хора пораждат необходимостта от разработване на комплексна, превантивно ориентирана програма с няколко приоритета – превенция с цел съхраняване на добро психично и физическо здраве на възрастните хора, ранно откриване на психичен упадък, деменции и минимизиране на инвалидността.

**Ключови думи:** здравен работник, гериатрични пациенти, медико-социални проблеми

## ABOUT SOME PROBLEMS OF MEDICAL AND SOCIAL NATURE IN CARING FOR GERIATRIC PATIENTS THROUGH THE EYES OF HEALTH WORKER

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**Abstract.** The health worker is a major agent in the care for geriatric patients by providing both medical care and a social and mental comfort for the old people. According to health workers, the current medical and social problems of health care in this contingent are associated with multiple pathology, difficulty in speech communication for perception and observance of appointments, inconsistency in desires and petulance, slowing of understanding, sensory and memory disorders, changes in the psyche and behavior determined by age. The shortage of well-trained staff, the large amount of administrative work and manipulations leads to a lack of time for carrying out specific professional duties and communicating with adult patients. This further complicates the work of the healthcare worker in the care of geriatric patients on the background of their specific health problems. Exactly the medical and social problems among old people give rise to the need to develop a comprehensive preventive-oriented program with several priorities – prevention for good mental and physical health of old people, early detection of mental decline, dementia and minimization of disability.

**Key words:** health worker, geriatric patients, medico-social problems



## SOME EPIDEMIOLOGICAL INDICATORS CHARACTERIZING THE SPREAD OF HEPATITIS A IN THE REGION OF STARA ZAGORA

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### ABSTRACT

**Introduction:** Viral hepatitis A is a widespread infectious disease with a faecal-oral mechanism of transmission of the infection. Together with other food-borne and water-borne infectious diseases, it is a global health problem.

**Aim:** To analyze some epidemiological indicators characterizing the prevalence of hepatitis A in the region of Stara Zagora for the period 2014-2016.

**Material and methods:** Annual reports of the Regional Health Inspection - Stara Zagora for registered cases of infectious diseases (statistical documentation - Form 3 - 85 approved by the Ministry of Health), acute infectious diseases analyzes in Bulgaria of National Center of Infectious and Parasitic Diseases and official statistical information of National Center of Public Health and Analyses.

**Results:** Viral hepatitis registered for the period is laboratory confirmed. The spread of the infected by gender shows a higher proportion of men - 54.81% (336 units), compared with the infected women (45.19%, 227 cases). The highest incidence of Acute Viral hepatitis A is registered in the most risky and susceptible to intestinal infections age groups - early childhood and school age. The incidence of Viral hepatitis type A in the region of Stara Zagora in 2016 is above the average for the country, unlike the previous two years. Three outbreaks of hepatitis A (2 in 2015 and 1 in 2016) were reported.

**Conclusion:** Prophylaxis and prevention are crucial to reducing morbidity, as the disease affects human health and life and also leads to economic losses. This requires increased public awareness of viral hepatitis A, enhancing the population's health culture, personal hygiene, and strict control over nutrition and water supply in settlements.

**Key words:** hepatitis A, epidemiological indicators, morbidity

### INTRODUCTION

Viral hepatitis type A is a widespread acute infectious disease with a faecal-oral transmission of the infection and it is characterized by liver parenchyma damage and jaundice. Together with other infectious diseases transmitted mainly with food and water, it is a global health problem (1). The source of the infection is the sick person. The virus is emitted by the feces, urine and saliva of the sick person. It is spread sporadically and epidemically (2, 3, 4).

### OBJECTIVE AND TASKS

The purpose of this study is to analyze some epidemiological indicators characterizing the prevalence of viral hepatitis A in the region of Stara Zagora for the period 2014-2016.

### MATERIALS AND METHODS

Annual reports of the Regional Health Inspectorate - Stara Zagora for the registered cases of infectious diseases (statistical documentation - Form 3 - 85 approved by the Ministry of Health), analyzes of acute infectious diseases in Bulgaria of the National Center for Infectious and Parasitic Diseases and official statistical information of the National Center for Public Health and Analyses are used (5-8).

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## NATURAL DISASTERS RISK – OFFICIAL STATEMENT AND AWARENESS OF WORKERS IN STARA ZAGORA REGION, BULGARIA

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### ABSTRACT

**Introduction:** Disasters caused by natural phenomena often occur in Bulgaria. They cause a large number of dead, disappeared and medical losses in the zone of defeat. Social and economic consequences have a significant adverse effect on development and economic growth. For this reason reducing the risk of disaster situations and the readiness for protection are exclusively matter to sustainable development. Awareness of people at risk of natural disasters in the region in which they live and work is essential to reduce risk and increase readiness to protect.

**Aim:** Research and analysis of the preparedness of workers for dealing with disaster situations in Stara Zagora Region, taking in mind the awareness of respondents for the most risky natural disasters.

**Material and methods:** An empirical sociological study is conducted through direct group self – administered questionnaire (SAQ) of 322 workers in various fields of the national economy in Stara Zagora Region. The survey was conducted from January to December 2016. The places of study were enterprises and companies in various industries in Stara Zagora Region, some of which are included in the list of sites of critical infrastructure in Bulgaria.

**Results:** Analysis of the results of the survey among workers in various fields of national economy in the Stara Zagora Region shows insufficient awareness about the risk of natural disasters as the majority of respondents indicate that there is no or little risk of them occurring.

**Conclusion:** Possible consequences in case of natural disasters require continuously and purposefully increase awareness about the most risky natural disasters in the area in which people live and work and remedies for protection and provision of first aid.

**Key words:** disaster, civil protection, natural disasters risk, workers' awareness about natural disasters risk, empirical sociological survey

### INTRODUCTION

Disasters caused by natural phenomena often occur in Bulgaria. They cause a large number of dead, disappeared and medical losses in the zone of defeat. Social and economic consequences have a significant adverse effect on development and economic growth. For this reason reducing the risk of disaster situations

and the readiness for protection are exclusively matter to sustainable development. According to one of the main European Union policies concerning humanitarian aid and civil protection in disasters in the Republic of Bulgaria has received a Strategy for Disaster Risk Reduction. In the established strategy are defined four priorities for action, one of which concerns the knowledge and awareness of the population about the risk of different types of disasters - "Building a culture of disaster protection at all levels of government and in the society using the experience, training,

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## STUDY OF THE TOXIC ACTION OF CHEMICAL WEAPONS THROUGH THE USE OF SIMULANTS

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### ABSTRACT

Chemical weapons have been used repeatedly in the history of mankind in a number of wars and terrorist acts. They have caused major damage to human health and taken many lives. Instead of chemical weapons, various simulants - compounds with a similar action of these weapons, but without such high toxicity for human health - could be used for developing antidotes to specific chemicals, doing research on detecting them, developing sorbents for gas masks, military exercises, etc.

The purpose of this report is to examine the possibilities of using chemical weapons through their simulants which resemble their toxic effects.

**Key words:** chemical warfare agents, tabun, sarin, soman, sulfur mustard

### INTRODUCTION

Chemical weapons have been repeatedly used in human history. They have damaged the health or killed many people. They pose a serious threat to the environment.

In many cases, instead of using real warfare agents, simulants can be used, especially in scientific research on the mechanisms of toxic action; in the process of developing antidotes; when experimenting on and studying their resorption through the skin; when developing means of protection, decontamination solutions and lotions; when studying the process of degradation of real warfare agents; when developing means and methods of detection; when carrying out military training, etc. Warfare agent simulants have very similar manifestation of a particular real warfare agent but, at the same time, pose lower risk to researchers, military staff and civilians. Their toxicity is lower and by rule, they are not that easily absorbed through the skin.

The team of authors has a rich experience in using simulants when researching the process of chemical warfare agents sorption in gas mask sorbents and in the eventual development of new sorbents.

The purpose of this paper is to present ways of using chemical warfare simulants, mimicking the toxic action of real warfare agents but much less dangerous for the people involved.

### Presentation

During the 1930s Strader's group carried out experiments on the toxic action of tabun, sarin, and soman with the purpose of using these chemical compounds as herbicides and insecticides for agricultural protection (1). An accident occurred and caused them severe intoxication. That incident gave clear indication of their potential as chemical warfare agents. In the years to come, they have repeatedly been used killing many people. These chemical compounds irreversibly inhibit acetylcholine esterase, an enzyme which acts in the mechanism of neural impulse transfer to the synapses. A similar action mechanism is observed in the later developed V-gases and the so called "novichki" nerve agents. Zelinski

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# Effect of a Small Selective Inhibitor of C-Jun N-Terminal Kinase on the Inducible mRNA Expression of Interleukin-6 and Interleukin-18

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## Abstract

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**BACKGROUND:** The expression of many inducible genes, involved in cell growth and differentiation as cytokine genes are regulated by receptor-activated intracellular signalling pathways, including the c-Jun N-terminal kinase (JNK) mitogen-activated protein kinase pathway.

**AIM:** We examined the involvement of the JNK signalling pathway in the regulation of the inducible interleukin-6 (IL-6) and interleukin-18 (IL-18) gene expression at the transcriptional level.

**METHODS:** Peripheral blood mononuclear cells (PBMC) from healthy donors were stimulated with lipopolysaccharide (LPS) and C3 binding glycoprotein (C3bgp) with or without SP600125 and cultured for 6 h. After mRNA isolation, a qRT-PCR was performed.

**RESULTS:** Regarding IL-6 and IL-18 mRNA expression, donors were divided into two groups of high and low responders. SP600125 inhibited significantly IL-6 mRNA transcription in the high responder group and did not influence the transcription level in the low responder group. Concerning IL-18 mRNA, we detect the significant effect of SP600125 on the inducible mRNA in high responder group upon C3bgp stimulation.

**CONCLUSION:** JNK transduction pathway is involved in the production of IL-6 mRNA, after LPS and C3bgp stimulation. We suggest that the inhibition of JNK may be beneficial only for higher responding patients during the treatment of inflammatory and autoimmune diseases.

## Introduction

The expression of many inducible genes, involved in cell growth and differentiation as cytokine genes are regulated by a receptor-activated intracellular signalling pathways including c-Jun N-terminal kinase (JNK) mitogen-activated protein kinase (MAPK) pathway. JNK is a serine-threonine protein kinase that by phosphorylation activates c-Jun, a part of the transcription factor AP-1 [1]. Many target genes regulating the cell cycle, apoptosis and cell survival with AP-1 binding sites are regulated by JNK transduction pathway [2]. In immune cells, JNK regulates the transcription of a lot of inducible genes, including inflammatory cytokine genes [3]. More precisely, JNK is involved in the regulation of TNF- $\alpha$ ,

IL-12p40, IL-10 and IL-23 as is shown by previous studies of our laboratory [4], [5], [6].

Interleukin-6 (IL-6) is a part of the inflammatory response initiated by recognition of antigens referred to as pathogen-associated molecular pattern (PAMP) molecules to the pattern recognition receptors (PRR) expressed by immune cells. IL-6 is a proinflammatory and immunoregulatory cytokine with hormone-like activity – it is involved in immune regulation, inflammation, and oncogenesis [7]. During acute – phase inflammatory response liver cells secrete CRP, serum amyloid A, complement proteins and fibrinogen in response to IL-6 stimulation [8]. IL-6 also plays a key role in the humoral immune response by stimulation of proliferation of activated B cells and antibody production [7]. IL-6 induces the development of Th17 cells from naive T cells together

ПОЛЗИ И НЕОБХОДИМОСТ ОТ ЛИЧНИ ПРЕДПАЗНИ СРЕДСТВА  
В РАБОТНАТА СРЕДА

Магдалена С. Платиканова, Жанета Рачева, Руска В. Паскалева, Ваня Б. Славова

BENEFITS AND NECESSITY FROM PERSONAL PROTECTIVE MEASURES  
IN THE WORKING ENVIRONMENT

Magdalena S. Platikanova, Zhaneta Racheva, Ruska V. Paskaleva, Vanya B. Slavova

**Резюме:** Личните предпазни средства са различни приспособления и предмети, които работниците използват за индивидуална защита, когато рисковете не могат да бъдат избегнати или намалени в достатъчна степен чрез средства за колективна защита. В настоящото проучване е направен анализ на нормативната уредба отнасяща се пряко до ЛПС (Наредба №3/19.04.2001г.), чрез която се транспонира Директива 89/656/ЕИО. Работодателите определят необходимите лични предпазни средства въз основа на оценката на риска и изготвят списък, който съдържа работните места, професиите и видовете дейности; вида, наименованието и точната идентификация на всяко лично предпазно средство; конкретната опасност и срока на износване. Ползата и необходимостта от личните предпазни средства в работната среда са тясно свързани със системните проучвания на мнението на работещите при закупуване на нови модели, информиране и обучение за безопасна работа при използване им, извършване на дейности по промоция на здравето и прилагането на добри практики при избора им.

**Ключови думи:** лични предпазни средства, работни места, добри практики

**Summary:** Personal protective equipment is a variety of items that workers use for protection. They are used when risks can not be avoided by means of collective redress. An analysis of the normative regulation was made concerning the protection of personal protective equipment (Ordinance No.3/19.04.2001), which transposes Directive 89/656/ European Economic Community. Employers determine the necessary personal protective equipment. On the basis of the risk assessment, draw up a list containing the jobs and types of activities; the type, name and identification of personal protective equipment; the specific hazard and wear time. The benefits of personal protective equipment in work environment are related to systematic surveys of workers' attitudes, information and training to work safely in carrying out health promotion activities and applying good practice.

**Key words:** personal protective equipment, work jobs, good practices

**ВЪВЕДЕНИЕ:** Личните предпазни средства са различни приспособления и предмети, които работниците използват за индивидуална защита от разнообразните професионални вредности, присъстващи в дадена работна среда. Употребяват се когато рисковете не могат да бъдат избегнати или намалени в достатъчна степен чрез средства за колективна защита или посредством мерки, методи и процедури при организацията на работния процес [2, 3, 4, 7].

**ЦЕЛ:** Целта на настоящото изследване е да се проучи ползата и необходимостта от осигуряване на лични предпазни средства в работната среда и да се посочат стъпките за изготвяне на програма за предоставянето им на работещите, като част от приложени добри практики в различните производства.

**МАТЕРИАЛ И МЕТОДИ:** Направен е анализ на нормативната уредба отнасяща се пряко до ЛПС (Наредба №3/19.04.2001г.), чрез която се транспонира Директива 89/656/ЕИО [1, 5].

**РЕЗУЛТАТИ:** Наредба №3/19.04.2001г. определя минималните изисквания за безопасност и опазване на здравето на работещите при използването на личните предпазни сред-

ства като акцентира върху избора, съхранението, поддръжката и подмяната им [5]. ЛПС не премахват въздействието на професионалните вредности, но отстраняват възможността за тяхното неблагоприятно въздействие и се явяват допълнение към основните мероприятия за защита на здравето, които се провеждат в различните отрасли на промишлеността и селското стопанство.

При работа с риск за здравето и безопасността, който не може да се отстрани по друг начин Работодателят с помощта на Службата по трудова медицина осигурява на работещите необходимите лични предпазни средства. В практическата дейност от изключително значение е да се прецени кога не трябва да се провеждат мероприятия за колективна защита и кога е целесъобразно и необходимо защитата на работещите да се осъществи чрез употреба на ЛПС [5]. Въз основа на оценката на риска се изготвя списък, който да съдържа различните видове работни места, професии и дейности; вида, наименованието и точната идентификация на всяко ЛПС; конкретната опасност и срока на износване. Необходимо е работещите да бъдат запознати с този списък.



# Increased Motor Activity And Proper Nutrition for Prevention of Complications in the Elderly with Diabetes

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## **Abstract.**

One of the most significant diseases worldwide, with a rapid rate of development leading to severe economic losses is diabetes mellitus type 2 (non-insulin dependent diabetes). Chronic metabolic disease of carbohydrate metabolism is characterized by high blood glucose levels and relative insulin deficiency. Approximately 6% of the adult population, estimated globally from 2010 to date, shows that type 2 diabetes (285 million people) accounts for about 90% of diabetes. The exercise of regular physical activity maintains muscles in good condition, prevents the onset of inactive hypotrophies or contractions, and activates various types of modulating downward control (pain suppression) to maintain the emotional tone of the patient. The purpose of the present study is the active participation of the students of specialty "Medical rehabilitation and ergotherapy" in the implementation of rehabilitation activities at the Diabetes Center - Stara Zagora, in elderly people with type 2 diabetes.

**Material and methods.** *The subject* of the study is 120 diabetic patients at the Diabetes Center - Stara Zagora with different types of diabetes. Five rehabilitation groups were developed, depending on the motor skills. The exercises are for one year with consecutive group work twice a week by the students during the clinical practice. This result is indicative of the stimulating effect of kinesitherapy and ergotherapy on the motor activity of patients. They all have increased motor skills in everyday activities

**Key words:** *motor activity, elderly people, diabetes, prevention of complications.*

## **Introduction**

The prevalence of both sexes is almost uniform, but regional differences are observed. Its frequency is higher in the Eastern Mediterranean and the American region (11% for both sexes) compared to the European Region and the Western Pacific (8-9% for both sexes) [33]. Every year 3.5 million people die from the disease or its deviations [34]. The disease affects 8.3% of the population in Bulgaria, the death rate for 2008, is 23.3 per 100 000 [35]. That is why the World Health Organization recognizes diabetes as a global epidemic [36].

Obesity along with the lack of physical activity, sleep that affects the metabolism of the body, bad eating habits, unhealthy eating, stress and urbanization are among the causes of the spread of type 2 diabetes [37,38]. For the development of the disease, the genetic predisposition is also of particular importance [39]. While some factors such as gender, age, genetic factors can not be controlled by the person, lifestyle factors can. This also determines the events associated with the prevention and prevention of type 2 diabetes. Life-related measures can reduce the risk of preventing the disease by more than 50 percent [40]. Proper nutrition and physical exercise occupy an important place in the prevention of the disease [41]. Seven percent of cases of type 2 diabetes are due to lack or insufficient physical activity [42]. Greater physical exercise combined with appropriate diet leads to better disease control results [43].

A basic element of diabetic treatment is dietary nutrition. Modern aspects of nutrition policy for type 2 diabetes at European and national level overlap the criteria and recommendations for healthy eating [44]. The diet should be individualized and tailored to the patient's eating habits and preferences. Energy is body-weight-dependent: normoenergy - in normal-body patients, hypoenergy in obesity, hyper-energy in underweight patients.

The quality of life and its elements have many definitions and interpretations. They are subjective and objective indicators of the physical, psychological, and social characteristics of the patient. The quality of life is a broad understanding of the balance between good and bad in the individual's body, soul, and environment as well as his pessimistic or optimistic view of life [23,24,27].

I. Topuzov (2006) defines the quality of life as a synthesis of the standard of life, personal interests and their realization in the style of life. At the present stage, the importance of quality of life stands out due to the following



*Original Contribution*

## THE ROLE OF SERUM AND LOCAL IgE CONCENTRATION IN QUALITY OF LIFE IN ALLERGIC RHINOSINUSITIS PATIENTS

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### ABSTRACT

**Purpose:** The task we set was to determine the concentrations of IgE molecules in serum and nasal lavage in patients with intermittent and persistent allergic rhinitis (AR) and to compare them with a control group of healthy volunteers, comparing the results with a quality of life questionnaire about their subjective feeling of potential health damage.

**Material and methods:** A comparison was performed between serum and nasal lavage IgE concentration in 50 participants - 40 cases and 10 controls.

**Results:** Serum level of IgE-total in the patients with intermittent (AR) was 284,19 IU/ml while in persistent (AR) patients - 215,29 IU/ml, but not significantly higher than in the controls - 160,87 IU/ml. IgE antibodies in nasal lavage in IAR patients was 1,39 IU/ml, while in PAR was 1,65 IU/ml and 1,05 IU/ml in controls. Total score of SNOT-22 in IAR (2,16) and PAR (2,03) was significantly higher than in the controls (0,85).

**Conclusions:** In our study, although the different serum levels of IgE among groups, we did not find significant correlation between the concentration of IgE antibodies in blood serum or nasal lavage and the degree of impairment of the quality of life in patients with IAR and PAR assessed by SNOT-22 quality of life test.

**Key words:** Allergic rhinitis, Chronic rhinosinusitis, Quality of life, SNOT-22, Immunoglobulin E

### INTRODUCTION

Allergic rhinitis (AR), is a common hereditary airway disease, which represents an inflammation of the nasal cavity, caused by first type allergic reaction to a variety of allergens, mediated by IgE and characterised by nasal congestion and nasal discharge (nasal drip), sneezing and itching. Very often the inflammation affects paranasal sinuses and even trachea and bronchi (AR with allergic asthma). When inflammation affects both nasal cavity and paranasal sinuses, the diagnosis is rhinosinusitis (ARS). ARS is characterised by nasal congestion or nasal discharge (anterior/posterior nasal drip) facial pain/pressure, reduction or loss of smell. In

case symptoms persist for more than 12 weeks, the diagnosis is chronic rhinosinusitis (CRS). (1) All symptoms are combined with objective signs of disease, identified by CT scan, X-ray and rhinoscopy. There are 2 different types of CRS, based on inflammation patterns: 1. CRS with nasal polyposis (CRSwNP), 2. CRS without nasal polyposis (CRSsNP) (2)

Allergic rhinitis is typically triggered by seasonal allergens such as grass or tree pollen, and indoor allergens such as dust mites, mold, cockroaches, animal dander (fragments of fur or feathers).

Immunoglobulin E (IgE) has a key role in multiple airway diseases, including allergic rhinitis (AR) and chronic rhinosinusitis with nasal polyposis (CRSwNP). Allergic rhinitis is a clinical manifestation of a first type (Coombs & Gell) hypersensitivity reaction. For the

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*Original Contribution*

## ANALYSIS OF HEALTH STATUS OF WORKERS IN COAL INDUSTRY

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### ABSTRACT

**Purpose:** Assessment of the health status of working operators in the substations in the coal industry.

**Material and methods:** Prophylactic examinations were carried out on 82 workers responsible for ensuring the security of the power supply in the mines. Some basic indicators (range of prophylactic examinations, relative share of sick persons, structure of the momentary illness) were followed. A connection has been sought between the established deviations in the health status and the working environment factors, as well as the harmful habits.

**Results:** Diseases of the organs of the circulation (66.03%) and "Endocrine diseases" (9.43%) predominate in the registered pathology. The same share is the class "Diseases of the eye and its eye appendages" and "Diseases of the respiratory system" (5.66%). Work environment factors are not directly related to health hazards. Smoking, alcohol consumption, obesity, stress are important to unlock some diseases.

**Conclusions:** Periodic medical examinations allow early detection of diseases and especially their timely treatment. On the basis of the health status analysis, the necessary health and medical activities, services and programs for the protection of the health of the employees can be developed, planned and implemented.

**Key words:** operators of electrical substations, mining industry, momentary morbidity, working conditions.

### INTRODUCTION

The mining industry is a sector in Bulgaria, in which labor productivity at very close to the EU average, which significantly exceeds the average performance of other industries. The number of workers, particularly in the sub-sector - coal mining, is large. Due to these facts, one of the priorities of our country is their health. Early detection of health problems and risk factors that determine them, create favourable conditions for its preservation and recovery. To assess the health status of workers in this sub-sector (coal mining), it is necessary to examine the impact of harmful factors in the work environment on the development of occupational diseases and work accidents (1-6). Employees in good health are more productive and more highly

motivated. Their good health leads to reduced absences and disruptions in the work process (7-9).

Within the mining production of interest is the health of the operators of electric substations as their main activity is providing electric energy on the territory of mines.

The purpose of this study is to analyze the current morbidity in operators of electric substations. The main indicators are tracked - scope of preventive examinations, relative share of sick persons, structure of current morbidity. A link between the identified deviations in health status and work environment factors and harmful habits is sought. Based on the results are suggested remedial measures to protect the health of workers.

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## Permanently reduced work capacity due to general illness, work-related accidents and occupational diseases in Bulgaria in the period 2012-2016

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**Background:** Chronic non-infectious diseases, work-related accidents and occupational diseases force people to live with permanent disability, to adapt their jobs, or to leave the labour market (1).

**Aim:** To establish the state of the permanently reduced work ability due to general illness, work-related accidents and occupational diseases in Bulgaria in the period 2012-2016.

**Materials and methods:** Data from the National Social Security Institute of Bulgaria's population, data of disability due to general illness, work injury and occupational disease in the period 2012-2016 (2-4) have been used.

**Results:** The population of Bulgaria accounted 7284552 people in 2012; it decreased by 2.51% in 2016. The relative share of persons tends to increase with disability due to general disease (4.98% in 2012; 5.41% in 2016;  $t=37.387$ ;  $P<0.001$ ), and tends to decrease due to work-related accident and occupational disease (0.09% in 2012; 0.08% in 2016;  $t=10.352$ ;  $P<0.001$ ). The proportion of persons over 64 years of age using benefits for general disease ( $t=49.276$ ;  $P<0.001$ ) and benefits for work-related accidents and occupational disease ( $t=3.739$ ;  $P<0.001$ ) increased in 2016, compared to 2012.

**Conclusions:** The deteriorating demographic indicators of the Bulgarian population, the declining and aging workforce have in a very large extent negative effect on the dynamics and profile of the disability due to general illness, work-related accidents and occupational diseases.

**Keywords:** Bulgaria, disability, occupational diseases, permanently reduced work ability, work-related accidents

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## Medical students' knowledge of nutrition – a pilot cross-sectional study

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**Background:** Nutrition is an important issue in medical training regarding the future role of medical students as practicing physicians (1-3).

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## Benefits and necessity from personal protective measures in the working environment

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**Background:** Personal protective equipment is a variety of items that workers use for protection. They are used when risks can not be avoided by means of collective redress (1-2).

**Aim:** The purpose of this study is to explore the benefits and best practices in the provision of personal protective equipment.

**Materials and methods:** An analysis of the normative regulation was made concerning the protection of personal protective equipment (Ordinance No.3/19.04.2001), which transposes Directive 89/656/ European Economic Community and has examined good practices in this direction (3-4).

**Results:** Employers determine the necessary personal protective equipment. On the basis of the risk assessment, draw up a list containing the jobs and types of activities; the type, name and identification of personal protective equipment; the specific hazard and wear time.

**Conclusions:** The benefits of personal protective equipment in work environment are related to systematic surveys of workers' attitudes, information and training to work safely in carrying out health promotion activities and applying good practice.

**Keywords:** personal protective equipment, work jobs, good practices

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## Perceptions and attitude of amassing knowledge and skills concerning protection and providing first aid in disastrous situations

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**Background:** The appearance of disastrous situations is followed by abundant humane, social, economical and natural consequences. In the area of the disasters, where the medical loss sets apart from by its frequency,

importance and high percentage of mixed lesions, the immediate protection and the correctly provided first aid define the prosperous end of the situation by saving lives of the injured (1-4).

**Aim:** Study the perceptions of amassing knowledge and skills concerning protection and providing first aid in disastrous situations.

**Materials and methods:** An empirical sociological study was conducted through direct group self-administered questionnaire (SAQ) of 322 workers in various fields of national economy in Stara Zagora Region. The total number of respondents was 350, of which 322 responded, response rate is 92%. The survey was conducted from January to December 2016. The places of study were enterprises and companies in various industries in Stara Zagora Region.

**Results:** Above the half of the inquired regard their knowledge and skills concerning protection and providing first aid as insufficient. It is visible the positivism about broadening knowledge and skills.

**Conclusions:** The people insufficient and inadequate information in terms of the manners of protection and providing first aid in disastrous situations pose a grave challenge. Education throughout all of the levels is an important part of the whole events which have the aim to prevent and reduce the consequences of crisis situations (5).

**Keywords:** disaster, disaster protection, first aid in disastrous situations, education of the population, empirical sociological survey

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## Water-related microbial biotoxins with potential for bioterrorist attacks

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**Background:** Mankind changes the composition and quality of the planet's water resources through exploitation, water transport, food and raw materials yield, and pollution. The impact of these factors, along with climate changes, in some cases favors the spreading in the water or bodies of some aquatic inhabitants of microorganisms producing biotoxins, pathogenic to humans and mammals (1). Given as an example could be some of the genus *Vibrio* (2-5) representatives, some cyanotoxins producing cyanobacteria such as saxitoxin, anatoxins, anatoxin-a, etc.

**Aim:** To review some potential bioterrorist threats by waterborne microbial biotoxins as well as the environmental conditions under which they are produced or distributed.

**Materials and methods:** bibliographic analysis.

**Results:** Over the last 50 years, the properties of increasing number of microbial biotoxins that potentially could be used for bioterrorism, as well as their presence in different water sources have been identified. Climate changes and water eutrophication create favourable conditions for their production and spread as a result of the increasing number of microorganisms producing them.



## **MAN-MADE DISASTERS RISK – OFFICIAL STATEMENT AND AWARENESS OF WORKERS**

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**Abstract.** In recent years, reducing risk associated with disaster situations has become a global priority. Awareness of people at risk of man-made disasters in the region in which they live and work is essential to reduce risk and increase readiness to protect and provide first aid. The goal of the research is to analyse the preparedness of workers for dealing with disaster situations, taking in mind the awareness of respondents for the most risky man-made disasters. An empirical sociological study is conducted through direct group self-administered questionnaire (SAQ) of 322 workers in various fields of the national economy in Stara Zagora region, Bulgaria. The survey was conducted from January to December 2016. The places of study were enterprises and companies in various industries, some of which are included in the list of sites of critical infrastructure in Bulgaria. Analysis of the results of the survey shows insufficient awareness about the risk of man-made disasters as the majority of respondents indicate that there is no or little risk of them occurring. Possible consequences in case of man-made disasters require continuously and purposefully increase awareness about the most risky man-made disasters and remedies for protection and provision of first aid.

**Keywords:** man-made disasters risk, reducing risk associated with man-made disasters, workers' awareness about the risk of man-made disasters, empirical sociological survey

## **AIMS AND BACKGROUND**

Natural and man-made disasters may pose threats to vulnerable infrastructure, visitors, and the public<sup>1</sup>. Social, economic, political and environmental consequences have a significant adverse effect on development and economic growth<sup>2,3</sup>.

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Original article

## INFLUENCE OF AN INHIBITOR OF JNK ON THE SECRETION OF THE INFLAMMASOME-DEPENDENT PROINFLAMMATORY CYTOKINES

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### ABSTRACT

**Purpose:** In this study, we determine the influence of prolonged exposure on organic air pollutants, on the secretion of inflammasome-dependent cytokines IL-1 $\beta$  and IL-18. We also investigate the involvement of the JNK signalling pathway in the inducible IL-1 $\beta$  and IL-18 secretion.

**Materials and Methods:** PBMC from healthy individuals working in an environment with organic particulate matter pollution and healthy donors working in an environment without pollution were isolated by density gradient centrifugation. The isolated cells were stimulated with LPS and C3b $\gamma$  with or without SP600125, a selective JNK inhibitor and cultured for 6 h. After cell supernatants harvesting, ELISA tests were performed for IL-1 $\beta$  and IL-18 mature protein quantification.

**Results:** The results showed that individuals working in a polluted environment secreted significantly higher levels of the biologically active IL-1 $\beta$  and IL-18 compared to individuals working in a non-polluted environment. We found that SP600125 inhibited the secretion of the mature form of both cytokines in the two groups - individuals with pollution and individuals without pollution significantly.

**Conclusion:** Environmental pollution with organic particulate matter leads to increased IL-1 $\beta$  and IL-18 secretion from peripheral immune cells. JNK transduction pathway is involved in the secretion of the biologically active form of IL-1 $\beta$  and IL-18, after stimulation. We suppose that individuals working in a polluted environment are predisposed to the development of inflammatory or autoimmune/allergic disorders, mediated by the permanent inflammasome activation. The inhibition of the JNK signalling pathway may be beneficial for the treatment of the condition mediated by the increased inflammasome-dependent proinflammatory cytokine secretion.

**Keywords:** IL-1 $\beta$ , IL-18, inflammasome, JNK, SP600125,

### INTRODUCTION

Interleukin - 1 $\beta$  (IL-1 $\beta$ ) and interleukin - 18 (IL-18) are proinflammatory cytokines, which are synthesized in an inactive form and secreted after proteasome-mediated cleavage mainly by the activated monocytes and macrophages in response to invading infectious antigens. They showed some structural similarity but mediated functional different immunological reaction [1]. IL-1 $\beta$  is a prototypic proinflammatory cytokine whose main function is as a mediator of an inflammatory response to infections and other inflammatory stimuli [2]. Upregulation of the IL-1 $\beta$  expression and associations with IL-1 $\beta$  gene polymorphisms are described in various inflammatory diseases such as rheumatoid arthritis [3], neurodegeneration and inflammation in Parkinson's disease [4], Behcet's disease [5], and other inflammatory and autoimmune diseases. IL-18 is also a proinflammatory cytokine but is involved in Th1 polarization of the immune response by its ability to induce IFN- $\gamma$ . In the absence of IL-12 or IL-15, IL-18 exhibits characteristics of other proinflammatory cytokines of the IL-1 family, such as increases in cell adhesion molecules, nitric oxide synthesis, and chemokine production [6]. There were experimental results showing the protective role of IL-18 in some fungal and bacterial diseases [7, 8]. However, IL-18 has also been suggested to be involved in autoimmune and inflammatory disease such as autoimmune diabetes [9], psoriasis [10], Crohn's disease [11] and systemic lupus erythematosus [12].

IL-1 $\beta$  and IL-18 share one common feature. They are synthesized as inactive precursor pro-IL-1 $\beta$  and pro-IL-18 and are transformed into biologically active IL-1 $\beta$  and IL-18 after proteolytic cleavage by intracellular cysteine protease caspase-1 [6]. Multimeric protein platforms called the inflammasomes are important regulators of this process [13]. Among NLR (nucleotide-binding oligomerization domain-like receptor) inflammasome complexes, the NLRP3 inflammasome is a key platform that

## The role of risk assessment in specific healthcare environment

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**Introduction:** Safety is one of the main criteria for the quality of medical care and is a priority in national and European health policy. Having a wide range of health activities, working in a specific environment, using a range of medical devices and medicines, and patient care requires an appropriate system for continuous risk assessment and risk control in healthcare organizations.

**Purpose:** The aim of this presentation is to review the role of risk assessment for quality assurance and safety of patients and personnel in healthcare organizations.

**Materials and methods:** A review and analysis of scientific publications, normative documents and work manuals has been performed using descriptive and comparative methods.

**Discussion:** The main principles and steps in the risk management process, and the factors influencing the probability and consequences of an adverse event were presented. The most frequently used methods and techniques for quantitative and qualitative risk assessment in healthcare were considered. The types of risks associated with specific medical activities were analyzed in order to create a system for assessment and control of hazards to reduce and prevent errors and injuries affecting both patients and professionals working in a specific environment.

**Conclusion:** The implementation of effective and proactive risk management in healthcare organizations contributes to their development and the provision of quality of care and patient safety, as well as a safety occupational environment for staff.

**Keywords:** risk assessment, safety, quality, healthcare

## Eating behavior of people living in Stara Zagora region

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**Introduction:** Nutrition has an important role for man. It is not an ordinary physiological process. It depends on many factors such as gender, age, professional commitment, physical activity etc.

**Purpose:** To study the eating behavior related to the number, timing of meals, consumption of breakfast, hot food at lunch and dinner, depending on some basic socio-demographic characteristics of people living in Stara Zagora region.

**Material and methods:** An anonymous random survey of 550 people of different ages from Stara Zagora region, was conducted. The data was processed by mathematical and statistical methods (SPSS for Windows).

**Results:** The analysis of variants proves that men eat more times than women. On average, people with primary education eat the less per day. There is no statistically significant effect on both the place of residence and employment on the number of meals per day ( $p = 0.77$ ). The ANOVA analysis showed a statistically significant effect of occupational employment on time ( $p = 0.042$ ) and breakfast ( $p = 0.0002$ ). Gender also affects breakfast time ( $p = 0.000276$ ) and breakfast consumption ( $p = 0.000327$ ). Hot food for dinner is consumed more than for lunch, 71.75% and 51.16%, which shows more attention to dinner. There is a trend among women's different feeding time and men having dinner later.

**Conclusion:** The study shows various aspects of eating behavior of people living in Stara Zagora region, arising from some socio-demographic factors. Future large-scale research is needed to gain an accurate picture of people's eating habits, health and lifestyle.

**Keywords:** nutrition, number of meals, eating behavior



## Research on the microclimate in children

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**Introduction:** The microclimate is a combination of physical parameters of the internal environment in a room, affecting the heat exchange in the body. The main microclimatic indicators are temperature, humidity, air velocity.

**Purpose:** To study the indicators of the microclimate in children's institutions in Stara Zagora region.

**Material and methods:** The survey was conducted in all 11 municipalities in Stara Zagora region, covering 108 kindergartens and 18 nurseries. The analysis of the received data is in compliance with the requirements of Ordinance №26/18.11.2008. for the structure and activity of the nurseries and children's kitchens and the health requirements to them and Ordinance №3/05.02.2007 on the health requirements to the kindergartens.

**Results:** The analysis of the obtained data shows that on the territory of Stara Zagora district the humidity on the premises is not reported in 114 (90.48%) kindergartens, the air temperature-in 3 (2.38%). The speed of air movement, which is related to its exchange, is not measured in any of the studied objects. Regular ventilation is required to ensure a constant supply of fresh air in the rooms yet in 15.08% of kindergartens those requirements are not met.

**Conclusion:** The microclimatic parameters with fluctuations within the comfort conditions, regulated in the normative documents, cause stress on the thermoregulation of the child's organism, which has a negative impact on its health and self-esteem. Strict control and observance of the health requirements over the microclimate in the kindergartens are necessary, in order to prevent the diseases related to this environmental factor.

**Keywords:** microclimate, nurseries, kindergarten

## Kinesitherapeutic treatment of osteochondrosis – presentation of a clinical case

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**Introduction:** Osteochondrosis, also called dyscarthrosis, is a degenerative process that develops in the discus intervertebralis of the columna vertebralis. In most cases, the disease occurs due to a combination of several etiological factors. We present a 59-year-old patient diagnosed with osteochondrosis. Computed tomography objectifies L4-L5 disc protrusion. Initial osteoporosis has been identified.

**Aim:** To determine the effect of applied kinesitherapy in a patient with osteochondrosis. Functional examination: Increased thoracic kyphosis with the presence of upper cross syndrome was identified. A reduced tone of m. quadriceps femoris was established, as well as muscle innervation by n. fibularis communis of the left lower limb. Painless crepitations in the shoulder girdle, hips and spine was also observed. Hyperesthesia of the left leg was found on the L4 dermatome.

**Results:** The applied treatment from the position reduced the pain symptoms. Scapula mobilization improved the range of motion and scapular-humeral rhythm and reduced the risk of impingement syndrome. The strength of m. quadriceps femoris and fibular muscles were significantly increased, as a result of the

## ФАКТОРИ ОБУСЛАВЯЩИ СТРЕСОВИ РЕАКЦИИ ПРИ СТУДЕНТИ ОТ МЕДИЦИНСКИ ФАКУЛТЕТ

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### РЕЗЮМЕ

**Въведение:** Широкото навлизане на компютризацията, въвеждането на нови учебни програми във връзка с онлайн обучението налагат както бърза адаптация на студентите към специфичните условия, така и водят до стресови реакции и промени в здравословното състояние.

**Целта** на настоящото проучване е да се проучат факторите, обуславящи стресови реакции при студенти от Медицински факултет, Тракийски университет, град Стара Загора. Въз основа на това да се разработят стратегии за намаляване на стреса.

**Материал и методи:** Обект на изследването са студенти от специалност „Медицинска сестра“. Проучването се базира на анонимна анкетна карта. Резултатите се обработени със следните статистически методи: групиране на данните и алтернативен анализ.

**Резултати:** Анализът на резултатите показва, че големият брой и обем на изучаваните дисциплини и изпити водят до нервно-емоционално напрежение и умора по време на семестрите и сесиите. Онлайн обучението и невъзможността за отработване на пропуснатите упражнения, работата в болнична обстановка, срещата с пациенти с тежко заболяване с неблагоприятен изход и техните близки са дейности, свързани със стресови реакции. Не по-малко значение имат и социалните фактори (финансови затруднения, търсенето на допълнителна работа, по време на следването) като стресов фактор, влияещ върху качеството на обучението.

**Заклучение:** Професията на медицинската сестра е изключително отговорна и генерира различни стресови реакции. Съвременната адекватна оценка и управление на стреса дава възможност за изработване на програма за преодоляването му.

**Ключови думи:** стрес, обучение, студенти, медицинска сестра

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## **PERCEPTIONS AND ATTITUDE OF AMASSING KNOWLEDGE AND SKILLS CONCERNING PROTECTION AND PROVIDING FIRST AID IN DISASTROUS SITUATIONS**

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**Abstract.** The appearance of disastrous situations is followed by abundant humane, social, economical and natural consequences. In the area of the disasters, where the medical loss sets apart from by its frequency, importance and high percentage of mixed lesions, the immediate protection and the correctly provided first aid define the prosperous end of the situation by saving lives of the injured. The aim of the study is to analyse the perceptions of amassing knowledge and skills concerning protection and providing first aid. An empirical sociological study was conducted through direct group self-administered questionnaire (SAQ) of 322 workers in various fields of national economy in Stara Zagora Region. Above the half of the inquired regard their knowledge and skills concerning protection and providing first aid as insufficient. It is visible the positivism about broadening knowledge and skills. The people insufficient and inadequate information in terms of the manners of protection and providing first aid in disastrous situations pose a grave challenge. Education throughout all of the levels is an important part of the whole events which have the aim to prevent and reduce the consequences of crisis situations.

**Keywords:** disaster, disaster protection, first aid in disastrous situations, education of the population, empirical sociological survey

### **AIMS AND BACKGROUND**

Different states of emergency, caused by various natural or man-made disasters are usually characterised by large-scale human, social, economic and environmen-

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## ХРАНЕНЕ И COVID-19 – НАГЛАСИ И ПРЕДИЗВИКАТЕЛСТВА ПРИ СТУДЕНТИ ПО МЕДИЦИНА ПО ВРЕМЕ НА ИЗОЛАЦИЯ И КАРАНТИНА

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## NUTRITION AND COVID-19 – ATTITUDES AND CHALLENGES AMONG MEDICAL STUDENTS DURING ISOLATION AND QUARANTINE

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**Резюме.** Здравословното и балансирано хранене е един от основните ключови компоненти на здравословния начин на живот. То е залог за дълготрайна промоция на здравето и превенция на редица заболявания. Проучването включва изследване на нагласите относно храненето при новата и неизвестна коронавирусна болест в периода на изолация и карантина. За целта с пряка пощенска анкетна карта са изследвани 77 студенти по медицина на възраст от 20 до 25 години. Въпросителните пред лечението, ваксината, имунитета, поведението поставят редица предизвикателства в начина на живот и в частност в храненето. Изследването показва, че високата здравна грамотност и култура на студентите им позволява да създадат свой модел за хранене в тази сложна епидемиологична обстановка, тъй като все още няма изследвания, доказващи или отхвърлящи връзката между здравословното и балансирано хранене и коронавирусната болест. Смятаме, че това може да бъде обект на проучвания на учени от целия свят, които ще обогатят знанията в тази област.

**Ключови думи:** коронавирусна болест, здравословно хранене, студенти по медицина

**Abstract.** A healthy and balanced diet is one of the main key components of a healthy lifestyle. It is a guarantee for long-term health promotion and prevention of a number of diseases. The survey included a study of nutritional attitudes in the new and unknown coronavirus disease during isolation and quarantine. For this purpose, 77 medical students aged 20 to 25 were surveyed with a direct postal questionnaire. The lack of scientific data on treatment, vaccine, immunity, behavior poses a number of challenges in lifestyle and particularly in nutrition. The study shows that high health literacy and culture allow students to create their own model of nutrition in this complex epidemiological environment, as there is still no research proving or dismissing the link between a healthy and balanced diet and coronavirus disease. We believe that this may be the subject of research by scientists from around the world, which will enrich the knowledge in this field.

**Key words:** coronavirus disease, healthy eating, medical students

Здравето е основният и най-голям приоритет, към който всеки човек се стреми всекидневно, осъзнато или не [1]. Ключът към доброто здраве и активно дълголетие е осигуряването на пълноценна и балансирана храна, съдържа-

ща необходимите макро- и микронутриенти. От хилядолетия е известно защитното действие на хранителния фактор. Той заема важно място в групата на оздравителните мероприятия, като повишава съпротивителните възможности на ин-

## **HORMONAL ASPECTS OF SLEEP REGULATION**

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### **Abstract**

The good quality of sleep is known to be strongly related with life quality and mental and physical health. Sleep regulation results from very complex interplay between many neural and humoral factors. The purpose of our study is to classify some main systems of hormones, that influence sleep.

A key player in sleep regulation is melatonin. At night there is a peak of melatonin secretion in both dark and light active species. It is referred to as a substance that keeps "dark appropriate" behavior. It is related with sleep promotion and it may help in sleep disorders. Other very important systems include two different hypothalamic-pituitary axes with reciprocal interactions - hypothalamic-pituitary-somatotropic (HPS) and hypothalamic-pituitary-adrenocortical (HPA) systems. The final effect on the sleep regulation depends on the ratio between growth hormone-releasing hormone (GHRH) and corticotropin-releasing hormone (CRH). The change in GHRH : CRH in favor of CRH has a role in the sleep-endocrine alterations during depression and aging. Enhanced activity of the hormones of HPA-system is thought to contribute to the downregulated melatonin levels and higher leptin levels in depression. Also, melatonin levels get lower after repetitive administration of CRH (the HPA -system inhibits melatonin effects). In literature there are very interesting data about separate regulation of the two type of sleep -

slow wave sleep (SWS) and rapid eye movement sleep (REMS). GHRH promotes NREMS (in males) and CRH has the opposite effect - it promotes wakefulness. Some studies suggest that CRH promotes REMS. Also, it is suggested that GHRH has a role sleep promotion after sleep deprivation (SD). There are other neuropeptides (except those produced by the HSA and HSP systems) that have an effect on sleep regulation - galanin and neuropeptide Y that stimulate SWS. Steroid hormones also participate in sleep regulation. The main one is cortisol. It promotes SWS and suppresses REMS in humans.

We can conclude that there are three main systems in sleep regulation - melatonin and HPS and HPA system, acting reciprocally and some other accompanying hormones, making a link between them or acting in concert with them to enhance or decrease their effects.

**Key words:** *Slow wave sleep, Rapid eye movement sleep, Hypothalamic-pituitary axes, Growth hormone-releasing hormone, Corticotrophin-releasing hormone, Melatonin.*



## **WATER AND SALT CONSUMPTION - BENEFITS AND RISKS**

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### **Abstract**

Consumption of water and salts are vital processes associated with maintaining homeostasis in the body. Both water and salts have several benefits for the body if taken in moderation. Excessive use is connected with many health risks. The present study aims to examine the frequency of water and salt consumption and the factors that determine this choice.

A survey was conducted among 550 (324 women and 226 men), aged from 18 to 65 years, living in the district of Stara Zagora, the Republic of Bulgaria. The participants were not selected according to any proportions of the population in the country and represent a random sample. The answers to the survey are coded and applied in the processing as codes or as ordinal and nominal values. The statistical data processing was performed based on descriptive and inferential statistics.

The analysis of the data shows that the majority of respondents - 46%, consume less than one liter of water per day, and carbonated water is among the least preferred types of beverages. It is consumed every day by 11.49% of the respondents. There is approximately equal distribution of people who do not use extra salt (36.52%) in their daily routine, 32.02% of them sometimes use extra salt, and those who prefer a saltier taste are 31.46%.

More in-depth studies are needed on the frequency of water and salt consumption and its determinants, as it is directly linked to human health. In this way, it can contribute to maximizing the benefits of these important substances for the body and to suppressing health risks.

**Key words:** *Consumption, Salt, Water, Benefit, Risk.*



## ФАКТОРИ, ОБУСЛАВЯЩИ КОНСУМАЦИЯТА НА ТЕСТЕНИ ИЗДЕЛИЯ

Петя Христова, Красимира Бенкова, Магдалена Платиканова

### FACTORS DETERMINING THE CONSUMPTION OF PASTRY

Petya Hristova, Krasimira Benkova, Magdalena Platikanova

**ABSTRACT:** Pastry is a main food that plays a key role in people's diets today. The present study aims to investigate the frequency of consumption of pastry, as well as the factors that determine it. In modern life, more and more people aim to achieve a healthier lifestyle, which includes eating fewer carbohydrates in the body.

A survey was conducted among 550 (324 women and 226 men) living in Stara Zagora district. The respondents make a random sample, as they are not selected according to any proportions of the population in the country. The main factors in the study are the characteristics: sex, education and employment. Statistical data processing was performed based on descriptive and inferential statistics using the SPSS package, version 25.

It has been found that men consume bread and pastry more often than women. More educated working respondents with a secure and steady income are more precise in their food choices, consume pasta less often, and stick to a greater variety of foods than their daily menu. Due to this development, more in-depth and extensive studies are needed to establish the influence of all factors relevant to the choice of food in a person's daily life. This would make it possible to refine the diet and optimize eating habits, and with it, health and quality of life.

**Key words:** determining factors, pastry, bread consumption, healthy eating

#### Въведение

Тестените изделия са основни хранителни продукти, заемащи ключово място в диетата на хората в наши дни [8,10]. Хлябът, като основен техен представител, е източник на въглехидрати, протеини, витамин В и Е, и се консумира все по-често, особено в развитите страни. В съвременното ежедневие хората имат за цел да постигнат по-здравословен начин на живот, което включва хранене с по-ниско ниво на постъпилите в организма въглехидрати [5,12].

Все по-често се обсъжда здравословното състояние като пряко зависимо от консумацията на тестени изделия [6.] Това е свързано с категоричните данни в световната литература за повишаване на висцералната мастна тъкан като резултат от включването на тестените продукти в диетата [4,7]. Този проблем от своя страна води до отключване на различни хронични заболявания и влошаване на здравето и качеството на живот [3].

Целта на настоящото проучване е да изследва честотата на консумация на тестени изделия, както и факторите, които я обуславят.

#### Материал и методи

Проведено е анкетно проучване сред 550 (324 жени и 226 мъже), живеещи в област Стара Загора. Респондентите съставляват случайна извадка, тъй като не са подбирани според никакви пропорции на населението в страната. Като основни фактори в изследването се разглеждат признаците: пол, образование и професионална заетост.

Отговорите на анкетата се прилагат в обработките като кодове или като ординални и номинални стойности. Статистическата обработка на данните е извършена на базата на дискриптивна и инферентна статистика с помощта на SPSS package, version 25.

#### Резултати

Консумацията на тестени изделия в ежедневието е много честа. Анализът на данните показва, че 28.72% от респондентите консумират тестени изделия всеки ден, 31.40% - 2-3 пъти седмично, 15.08% - един път седмично, рядко - 21.90% от анкетираните и едва

## STUDY OF THE PSYCHO-EMOTIONAL CONDITION AND WORKING ABILITY OF MEDICAL STUDENTS

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### Abstract

The training of students majoring in "medical assistant", "nurse" and "medicine" is one of the most responsible and is associated with great mental and physical stress. Various factors affect students during their studies and one of them is psycho-emotional stress, which is significantly manifested in clinical practice. In their course of study, students must acquire theoretical knowledge and practical skills in the relevant specialty, but must also be familiar with the mechanisms of action of stress and be trained to recognize it to deal with it at an early stage. Specialized training for stress is not included in the curricula of students, and it would be one of the main and decisive methods for prevention of mental and physical consequences of stress in the workplace afterward. The study showed that students should be aware of workplace stress, which affects their psycho-emotional state and ability to work. Awareness is essential for the smooth performance of their future work as medical professionals, because the work of medical professionals is directly related to patients, their relatives, and colleagues, and these interpersonal relationships often affect the psycho-emotional state and ability to work.

**Keywords:** *Psycho-emotional state, students, patients, aspects, ability to work*

### Introduction

The training of students majoring in "medical assistant", "nurse" and "medicine" is one of the most responsible and is associated with great mental and physical stress. Various factors affect students during their studies and one of them is psycho-emotional stress, which manifests itself significantly in clinical practice.

Stress in psychology, neurology, and psychiatry is a state of strong physical, nervous tension caused by negative factors or negative physical or emotional impact and sensation. This is especially true of high and even very high levels of stress, which can harm physique, emotions, and mental concentration, while lower levels can be factors in adaptation and coping. At the same time, some very high levels of stress can lead to a high level of motivation and skills in a professional aspect [14, 15].

Psychosocial risks and stress in the workplace are among the biggest challenges to safety and health at work. If considered as an organizational problem, they can be managed like any other risk in this area [3].

### Materials and methods

A study was conducted with 40 medical students through an interview and a direct anonymous survey related to the psycho-emotional state and ability to work in their university training in June 2020.

### Results and discussion

The causes of stress are growing globally and nationally. Occupational stress arises under the influence of work-related factors. Young professionals are especially at risk of occupational stress. Even before they started working.

Georgieva (2017) examines current issues related to stress in the workplace. Students face many different situations daily. They face the dilemma of making the right choices or making





## DIET AND COVID-19

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### ABSTRACT

**Introduction:** A balanced diet is an important factor that needs to be emphasized to cope with the COVID-19 challenge. Several other factors, such as age, sex, health, lifestyle, influence the course and outcome of the disease. The key role of nutrition is the ability of a variety of foods to boost immunity and help the body fight the virus. **Purpose:** The present study aimed to investigate the factors and mechanisms that determine adequate nutrition with COVID-19. **Methods:** Scientific researches related to the problems of nutrition for coronavirus infection have been studied. An analysis and evaluation of official documents of the World Health Organization related to balanced nutrition in the pandemic have been made. **Results and discussion:** There is evidence in the world literature for the recommended inclusion of certain food groups such as fresh fruits and vegetables, whole grains, nuts, soy. The recommendations also include limiting the intake of foods high in sugar, salt, or fat. Consumption of unsaturated fats of vegetable origin is preferred to those of animal fats. Unsaturated ones are contraindicated because they do not have a stimulating effect on the immune system. In addition to these data, it is reported in the literature that diets high in saturated fat, sugars, and refined carbohydrates lead to obesity and type 2 diabetes, which are among the main risk factors for the severe course and higher COVID-19 mortality rate. **Conclusion:** In conclusion, we can say that a healthy diet and lifestyle are factors with a key role in preventing and combating this infectious disease, as well as against the complications it can lead to. A balanced diet can become an effective "tool" in the fight against COVID-19 in a pandemic if properly prepared.

**Key words:** balanced diet, nutritional status, COVID-19

### INTRODUCTION

Proper nutrition and a balanced diet are vital factors that have always been associated with a stronger immune system and a lower risk of chronic diseases and infectious diseases (1, 2).

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According to the World Health Organization (WHO), in the context of the COVID-19 pandemic, it is necessary to include a variety of fresh and unprocessed foods in the diet to supply the body with the necessary vitamins, minerals, fibers, proteins, and antioxidants. The consumption of sufficient water is also important to the recommendations, as hydration is also vital to deal with this infectious disease. It is advisable to avoid sugar, fat, and salt to significantly reduce the risk of overweight, obesity, and the



## EATING HABITS DURING THE COVID-19 PANDEMIC

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### ABSTRACT

**Purpose:** The present study aimed to investigate eating habits and changes in them occurring during the COVID-19 pandemic, as well as cases

after the disease. **Methods:** A survey was conducted among 64 people aged between 18 and 65 years, divided into five age groups. The survey was prepared and submitted for completion electronically through the Google Forms platform. The data were processed using Microsoft Excel 2020 and were presented by charts. **Results:** 78.1% of the respondents had COVID-19 and 21.9% did not suffer from the disease. 62.5% of the participants in the survey stated that they noticed changes in their eating habits during the disease, 25% had no changes, and 12.5% could not determine a noticeable difference in their eating behavior. As a consequence of the change in eating habits, there was a change in the weight of a significant percentage of respondents. 43.8% of them lost weight, 31.2% gained weight, and 25% - had no change. There was also a change in preferences for certain food groups during and after the disease. **Conclusions:** The COVID-19 disease affects eating habits. More in-depth research is needed to clarify the causes and mechanisms by which these processes take place.

**Key words:** eating habits, pandemic, COVID-19

### INTRODUCTION

The coronavirus infection (COVID-19) is a severe acute respiratory syndrome caused by the coronavirus SARS 2 (SARS-CoV-2) (1). It is a global problem that retains its significance over time. It unfolds various areas and topics that concern people all over the world (2). Social isolation, as well as the disease itself, is a challenge in the daily life of modern man because it harms mental and physical health, as well as eating habits (3).

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The COVID-19 pandemic is associated with the emergence of stressful conditions that can lead to a dramatic change in our eating habits. This could have a significant impact on health and the immune system, as a balanced diet is essential to cope with the infection (4, 5). The change in eating habits and lifestyle caused by the COVID-19 pandemic is also linked to changes in weight (6).

A study by Spanish scientists among the population shows that during the pandemic there is an increased consumption of unhealthy food. In addition, the physical activity is also reduced and this leads to serious health risks (7). Data from studies in the United Arab Emirates are similar. 31% reported gaining weight and 38.5% did not have regular physical activity. Lifestyle changes, including eating habits, lack of physical activity,



## СТРЕС, РАБОТОСПОСОБНОСТ И ЗДРАВНО СЪСТОЯНИЕ НА СТУДЕНТИ ОТ МЕДИЦИНСКИ ФАКУЛТЕТ – СТАРА ЗАГОРА

Петя Христова, Албена Андонова, Магдалена Платиканова

## STRESS, WORK ABILITY AND HEALTH OF STUDENTS FROM MEDICAL FACULTY - STARA ZAGORA

Petya Hristova, Albena Andonova, Magdalena Platikanova

**ABSTRACT:** Medical professionals, including students from various medical specialties, fall into the group of professions with the highest levels of stress. It is known that due to its nature, medical education is perceived as a stressor, and this can have a negative effect on the physical and mental condition, work ability and health of students in these specialties. The work ability index is often used as a reliable tool to assess work ability.

The purpose of this study is to assess some stressors, work ability and health of medical students.

Using an electronic questionnaire, 175 students from the medical specialties in Medical Faculty, Trakia University, Stara Zagora were interviewed.

The levels of stress associated with training in medical specialties were examined. The results showed that the daily life of 24.1% of students is characterized by high levels of stress quite often, followed by those who are stressed often - 30.7 percent. Students who experience stress sometimes are 23.9%, and those for whom it is a rare condition are 9.7 percent. Only 1.7% of students do not feel stressed. This requires the implementation of new strategies to optimize studying in these specialties and reduce stress levels in order to improve work ability and quality of work in health care.

**Key words:** stress, work ability, students, medical specialties

### Въведение

Стресът е физиологичен и психологичен процес, чрез който индивидът реагира на събития или ситуации, предявяващи повишени изисквания и оказващи натиск върху него. Медицинските специалисти в това число и студентите от различните медицински специалности попадат в групата на професиите с най-високо ниво на стрес. Те са подложени на непрекъснат стрес поради спецификата на работата си, нерегламентираното работно време, широкия социален контакт с хора от различни възрасти и с различна социална и културна среда. Това води до промени в работоспособността и здравето им състояние.

Известно е, че поради естеството си медицинското образование се възприема като стресогенен фактор, а това от своя страна може да има отрицателен ефект върху физическото и психическото състояние, работоспособността и здравето на студентите от тези специалности [3,4]. За оценка на работоспособността като

надежден инструмент често се използва индексът на работоспособност. Той се определя чрез отговори на поредица от въпроси, които се базират на характеристиките на работата, здравословното състояние и ресурсите на студента или работещия [7]. Този индекс все по-често се влиза в употреба при оценка на работоспособността на здравни работници и студенти по медицина, тъй като е лесен и удобен метод за оценяване и средство за поддържане и подобряване на работоспособността [2,8]. Извършването на оценка е от изключителна важност за хората, които се обучават или работят в сферата на здравеопазването, защото на тях е възложена отговорността да се грижат за здравето на широк кръг от пациенти и това създава повишен риск от намаляване на физическите и психическите ресурси поради сериозното натоварване в работната среда [15].

Целта на настоящото проучване е да се извърши оценка на някои стресогенни фактори,





## Dependence of Body Mass Index on Some Dietary Habits: An Application of Classification and Regression Tree

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### Abstract

**Background:** The purpose of this study was to determine the influence of some eating habits on body mass index (BMI) using a regression model created via the classification and regression tree method (CART).

**Methods:** The study was conducted using a questionnaire specially developed for the study, evaluated for reliability and validity. In addition to demographics (age and sex), the questions concern the timing of the meals and the type of food consumed. The data contains records for 533 people (322 women and 211 men) aged 18 to 65 years. The survey was conducted in the period 2019-2021 in Stara Zagora, Bulgaria. Data were processed using descriptive statistics, and regression and classification data mining method CART.

**Results:** A CART model with a dependent variable BMI and predictors Sex, Age, Breakfast type, Breakfast time, Lunchtime, Lunch type, Dinner time, Dinner type have been created. The obtained model is statistically significant at a significance level of  $P < 0.0001$  and a coefficient of determination  $R^2 = 0.495$ . The normalized importance of the factors that affect the BMI is as follows: Sex (100%), Age (61.4%), Lunch type (26.0%), Lunchtime (18.8%), Dinner time (13.9%), and Breakfast type (13.2%). Women have a lower BMI than men. BMI increases with age.

**Conclusion:** The CART method allows to make a classification by the predictors used and gives opportunities for a more in-depth analysis of the reasons for the increase in BMI. The level of influence of diet and eating habits (type of food, time of consumption) on BMI was determined.

**Keywords:** Body mass index (BMI); Dietary habits; Classification and regression tree (CART method)

### Introduction

Nutrition plays a key role in human health (1-3). It is the main energy source and can contribute to a good quality of life (4,5).

The anthropometric indicator- body mass index (BMI) is most often used to assess the nutritional and health status. BMI refers to people with low physical activity. BMI is directly related to eating

habits. Consumption of plant-based foods and fish is associated with lower BMI (6-8). Meat and foods rich in carbohydrates lead to increased BMI (6,9). Skipping breakfast in the morning also affects BMI. According to scientists, skipping breakfast leads to increased BMI (10). Late dinner also increases BMI (11). People who dine late



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## **GENETICALLY MODIFIED FOOD – AWARENESS AND CHALLENGES**

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**Abstract.** Genetically modified (GM) are foods that are produced by organisms with modified genetic material. The present study aimed to assess people's awareness of genetically modified food and the propensity of the population to consume such products. A questionnaire survey was conducted among 550 (324 women and 226 men) living in Stara Zagora district, Bulgaria. The respondents are a random sample, as they are not selected according to any proportions of the population in the country. The statistical data processing was performed based on descriptive and inferential statistics. The study showed that the main factors influencing the awareness and consumption of genetically modified foods are age and employment. It was established that there was a tendency for more frequent consumption of GM foods among young people. In terms of professional employment, the largest share of people was for these on-state jobs and working people. They were better informed about the nature of genetically modified foods and consumed them most often. The results show that most often people are informed about GM foods from the Internet. Genetically modified food is a topic that is important for a lot of people. More in-depth research is needed on the subject, as there is conflicting data among scientists around the world in terms of their advantages and disadvantages.

**Keywords:** awareness, Bulgaria, challenge, consumption, genetically modified food.

### **AIMS AND BACKGROUND**

Genetically modified (GM) are foods that are produced by organisms with modified genetic material. According to the World Health Organisation (WHO), the Food and Agriculture Organisation of the United Nations, and the European Commission, this modification occurs differently from the natural one<sup>1,2</sup>. Most often in this process of production of genetically modified foods, a gene from another organism is introduced. The technology is known in the literature as “genetic engineering”. The GM foods currently available come mainly from plants, but with a tendency for future production of genetically modified food from GM microorganisms or

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## Air pollution prevention in Stara Zagora Municipality

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**Abstract.** Nowadays, air pollution is one of the current and global environmental problems both around the world and in one of the best-developed municipalities in Bulgaria - Stara Zagora. The deterioration of air quality is also favored by the migration and long-distance transport of the most important atmospheric pollutants for the municipality - sulfur dioxide, dust, nitrogen dioxide, lead aerosols, and hydrogen sulfide. This article aims to propose some hygienic and environmental measures for the rehabilitation of the air basin in the municipality based on a study of air pollution and its impact on the health of the population. The complex of activities is aimed at installation of efficient treatment facilities in various industrial enterprises; reconstruction of the heating installations and introduction of the use of electric current for heating during the winter months; accelerating the gasification process; public works, including landscaping of more areas in the city; optimal reorganization of automobile traffic and moving the car traffic out of the city.

### 1. Introduction

Anthropogenic air pollution is one of the main causes of environmental problems that have transcended national borders and become global [1]. This requires continuous measures to maximize the restoration of ecological balance. In addition to nature, air pollution also affects the health of the population.

According to the World Health Organization (WHO) criteria, the main air pollutants that characterize air quality over a long period are dust, sulfur dioxide, and nitrogen dioxide [2].

In the present work, two more pollutants are considered - hydrogen sulfide and lead aerosols. Together with the above pollutants, they are of priority importance for the municipality of Stara Zagora, as they affect the health of the population. Today, although the concentrations of many of the air pollutants sulfur dioxide, carbon monoxide, and lead have decreased significantly, Europe has not yet achieved the air quality provided for in its legislation [3,4].

The present work aims to propose some major measures for future activities promoting the solution to the problem of air pollution in the municipality of Stara Zagora, based on an analysis of air pollution and its impact on the health of the population.

### 2. Materials and methods

The data used for the current article were from the Unified National System for Monitoring and Control of Atmospheric Air Pollution. We studied the impact of pollution on the morbidity of the



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# INFLUENCE OF SOME SOCIO-DEMOGRAPHIC INDICATORS ON THE CONSUMPTION OF ORGANIC FOOD

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## Abstract

The present study aimed to investigate the impact of some socio-demographic indicators on the consumption and awareness of organic food. A questionnaire of 550 people (324 women and 226 men) was conducted in the period 2019-2021. The respondents were residents of Stara Zagora, Central Southern Bulgaria, Southeast Europe. The respondents were of different ages, with different education and professional status. Data processing was performed using descriptive statistics and the SPSS package, version 25. Regarding the socio-demographic indicator age, the largest number (N) 36 (6.86%) of the respondents answered that they consume organic food and fall into the age group from 21 to 30 years. The largest number of people consuming organic food is this in-state job and working people – 48 (9.27%) people for each group. The distribution by sex shows that the largest number of women consuming organic food buy them from local and specialized shops for organic food – 85 (16.07%). The analysis of the data shows the significantly higher number of women who find such a difference - 196 against 100 men. Organic foods are increasingly entering our daily lives and this raises the need for future research in this area to establish the relationship between organic foods and various factors and the benefits of their consumption.

**Keywords:** organic food, socio-demographic indicators, Bulgaria

## AIMS AND BACKGROUND

Personal health, longevity, and ability to work are directly related to food consumption. Related to this, in the last two decades, organic foods have become increasingly popular. Therefore, the attention of many scientists is focused on analyzing their presence in our daily lives.

Organic food is a product of organic farming. In the countries of the European Union, part of which is the Republic of Bulgaria, strict legal rules are followed in their production. Bulgaria is a country in Southeastern Europe, located in the eastern part of the Balkan Peninsula. In organic production in the country, crops are grown or processed without the use of synthetic substances (synthetic fertilizers, pesticides and cannot be genetically modified). Animals are kept with sufficient natural light, space, and fresh air, fed with organic food, and the use of hormones and antibiotics is prohibited.

# FACTORS DETERMINING THE CHOICE OF FOOD PRODUCTS

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## Abstract

Nowadays, nutrition, in particular the choice of food, is important, extending far beyond the ordinary physiological process. The aim of the present study is to investigate the factors that influence food choice.

The survey was conducted as a questionnaire among 550 participants (324 women and 226 men) aged from 18 to 65. The participants in the study are residents of Stara Zagora District. An analysis of the results from the survey with data coding and application in the processing as ordinal and nominal values was performed.

The results show that the most frequently consumed food groups are fresh vegetables (54.44%), followed by fresh fruits (43.47%), meat and meat products (43.33%), confectionery (30.20%), milk (30.04%), cheese and cottage cheese (29.49%), pasta (28.72%). The choice of food is determined by a number of factors such as sex, age, education, and employment, as well as socio-economic status. There are differences in the results among the different target groups. The sex distribution shows that 12.79% of women and 6.98% of men eat a healthy diet on a regular basis. According to age, 6.98% of people in the age group 41 - 50 eat healthy, followed by those aged 21 - 30 (6.60%). Respondents with secondary and higher education show the highest results in terms of healthy eating - 9.02% and 8.64%, respectively. More future in-depth research is needed to focus on food choices and diets.

Informing people about healthy eating can lead to greater success in establishing it as a regular practice. With the help of self-assessment, self-control, and nutrition information obtained from general practitioners, healthy eating can become an effective method of disease control and prevention.

**Key words:** Food choice, Food products, General practitioners (GPs), Nutrition assessment, Healthy eating.

## Introduction

Nowadays, nutrition, in particular the choice of food, is important, extending far beyond the ordinary physiological process. It can be considered from different angles, specifying its effects on the health, social life, and professional and personal development of people [1,2,3]. It should be taken into account that the choice of food is determined by many factors - biological, physical, social, and psychological [4,5]. To ensure a good quality of life, it is necessary to eat a variety of food groups, adjusted to the lifestyle, physical activity, and health of each person [6]. According to the World Health Organization (WHO) and the American Dietetic Association, eating a variety of foods helps children and adults get the essential nutrients they need, and avoid foods high in sugar, fat, and salt. [8]. Healthy eating is relevant to every stage of a person's life. Vital nutrients support normal growth, development, and aging, maintain normal body weight and reduce the risk of obesity and chronic diseases [9,10,11,12]. This fact shows how important the choice of food is for healthy eating as a role in this process has the general practitioners. They are the first to meet patients and is best acquainted with their health due to the long follow-up they carry out. Nutrition advice from general practitioners is highly valued by the general public, but literature data show that there are several barriers to providing nutritional advice in general