

**4TH INTERNATIONAL CONFERENCE OF SC ON OCCUPATIONAL MEDICINE
3RD MACEDONIAN CONGRESS ON OCCUPATIONAL HEALTH**

BOOK OF ABSTRACTS



Македонско здружение за
медицина на трудот
Macedonian Society for
Occupational Medicine



BOOK OF ABSTRACTS

of the

*4th International Conference of SC on Occupational Medicine
3rd Macedonian Congress on Occupational Health*

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Член на компанијата Sandoz



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За мое добро.



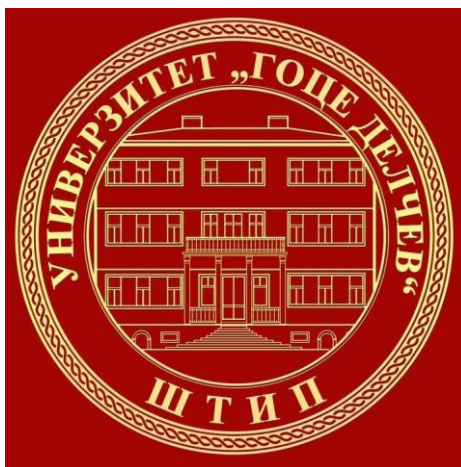
**ЈЗУ ИНСТИТУТ ЗА МЕДИЦИНА НА ТРУДОТ
НА РЕПУБЛИКА СЕВЕРНА МАКЕДОНИЈА - СКОПЈЕ**
**ISHP INSTITUTI I MJEKËSISË SË PUNËS
I REPUBLIKËS SË MAQEDONISË SË VERIUT - SHKUP**

ZeNTIVA





Ladna



FINAL PROGRAM

7 th May 2026 (Thursday)				
Opening Lectures				
Time	17.30pm-17.50pm	17.50pm-18.10pm	18.10pm-18.30pm	18.40pm-20.00pm
Duration	20 mins	20 mins	20 mins	80 mins
Speaker	Alberto Modenese - Italy	Milan Milosević - Croatia	Gogillan Sevaratnam - Malaysia	Cocktail
Organisation	University of Modena & Reggio Emilia (UniMoRe), Modena	Andrija Štampar School of Public Health, University of Zagreb	SCOM	
Topic	Outdoor work and exposure to UV radiation in the climate change era: occupational risks and health surveillance	The Future of Work: Adapting Occupational Medicine to Digital Transformation, AI tools and Remote Work	Cancer & Work Capabilities	
8 th May 2026 (Friday)				
	Plenary Session I	Plenary Session II	Semi-Plenary I	Semi-Plenary II
	9.00am-10.00am	10.00am-11.00am	11.20am-11.50am	11.50am-12.20pm
Time	9.00am-9.20am	10.00am-10.20am	11.20am-11.35am	11.50am-12.05pm
Duration	20 mins	20 mins	15 mins	15 mins
Speaker	Vishnumohan Janardhanam - India	Norvil Mera Chu - Peru	Shyam Pingle - India	Engin Tutkun - Türkiye
Organisation	SCOM	ICOH Peru	Vice President, International Commission on Occupational Health	Tez Medical Institute of Occupational Health and Safety
Topic	AI, Automation & Ergonomics - Man Machine Interaction	Protecting the Source: Medical Surveillance Best Practices in Peru's Blueberry and Grape Sector	The ICOH Journey	Endocrine Disruptors from Toxicological Point of View
Time	9.20am-9.40am	10.20am-10.40am	11.35am-11.50am	12.05pm-12.20pm
Duration	20 mins	20 mins	15 mins	15 mins
Speaker	Dejan Mirakovski - N. Macedonia	Moazzam Zaidi - New Zealand	Katya Vangelova - Bulgaria	Aleksandar Milovanović - Serbia
Organisation	University "Goce Delcev", Stip	SCOM	National Center of Public Health and Analyses, Sofia	Institute of Occupational Medicine "Dr. Dragomir Karajović"
Topic	Assessing Personal Chemical Exposure: Monitoring, Technologies, and Comparative Data in the Western Balkans	Occupational Toxicology and Surveillance: What You Need to Know	Safety and Health at Work for Aging Workforces	Health Examinations for Class 1, Class 2, and Class 3 in Aviation Medicine - the Role of Occupational Medicine Specialist
Time	9.40am-10.00am	10.40am-11.00am		
Duration	20 mins	20 mins	Networking – Viziomed MK	
Speaker	Vladimir Kendrovski - Germany	Damien McElvenny - UK	11.00am-11.20am	
Organisation	WHO Regional Office for Europe, European Centre for Environment and Health, Bonn	The University of Manchester		
Topic	Climate Change and Workplace Heat Stress: Call for Action	Evidence Synthesis in Occupational Medicine		

9th May 2026 (Saturday)				
	Plenary Session III	Plenary Session IV	Semi-Plenary III	Semi-Plenary IV
	9.00am-10.00am	10.00am-11.00am	11.20am-11.50am	11.50am-12.20pm
Time	9.00am-9.20am	10.00am-10.20am	11.20am-11.35am	11.50am-12.05pm
Duration	20 mins	20 mins	15 mins	15 mins
Speaker	Elizabet Paunović - Serbia	Jordan Minov - N. Macedonia	Malcolm Sim - Australia	Marija Zdraveska - N. Macedonia
Organisation	WHO Regional Office for Europe, Ex Head of the European Centre for Environment and Health, Bonn	Institute of Occupational Health; Faculty of Medicine, Ss. Cyril and Methodius, University in Skopje	Monash Centre for Occupational & Environmental Health, Melbourne	University Clinic for Pulmonology and Allergology; Faculty of Medicine, Ss. Cyril and Methodius, University in Skopje
Topic	Occupational and Environmental Health within One Health Paradigm- Implications and Opportunities	Occupational lung diseases: where are we now?	The Rising Epidemic of Silicosis from Artificial Stone: A Call for Action	Mesothelioma - can we tame the shrew?
Time	9.20am-9.40am	10.20am-10.40am	11.35am-11.50am	12.05pm-12.20pm
Duration	20 mins	20 mins	15 mins	15 mins
Speaker	Jovanka Karadzinska Bislimovska - N. Macedonia	Nurka Pranjić - Bosnia and Herzegovina	Jasmina Chaloska, Trajce Velkovski - N. Macedonia	Deska Dimitrievska - N. Macedonia
Organisation	Faculty of Medicine, Ss. Cyril and Methodius, University in Skopje	Faculty of Medicine, University in Tuzla	Faculty of Mechanical Engineering, Ss. Cyril and Methodius, University in Skopje	University Clinic for Pulmonology and Allergology; Faculty of Medicine, Ss. Cyril and Methodius, University in Skopje
Topic	The Evolution of Occupational Health Systems: Integrating Policy, Education, Clinical Vigilance, and Preventive Action in a Changing Global Environment	Determinants of Ageism and Ageism Behaviour Among Older Employees	Screenism among Student Youth	Nicotine Dependency Treatment in the Working-age Population in Macedonia
Time	9.40am-10.00am	10.40am-11.00am		
Duration	20 mins	20 mins	Networking	
Speaker	Mohamed F Jeebhay - South Africa	Stefan Esser - Germany	11.00am-11.20am	
Organisation	School of Public Health, Faculty of Health Sciences, University of Cape Town	International SOS		
Topic	A novel questionnaire and algorithm for improved detection of occupational asthma in workplace-based medical surveillance	Travel Medicine		

Special Sessions		
	8 th May 2026	9 th May 2026
	Commercial Presentations I	Commercial Presentations II
	13.20pm-14.00pm	13.20pm-14.00pm
Time	13.20pm-13.40pm	13.20pm-13.40pm
Duration	20 minutes	20 minutes
Theme	Turn on your curiosity. The power of breath is ON!	t. b. c.
Organisation	ZENTIVA Macedonia	t. b. c.
Time	13.40pm-14.00pm	13.40pm-14.00pm
Duration	20 minutes	20 minutes
Theme	Support of Patients with Seasonal Allergies: Scientific and Practical Aspects of Allergoforte	The Role of Combined Inhalers in the Management of Respiratory Diseases
Organisation	Replek AD	Providens DOO
	Special Session - I	Special Session - V
Time	14.00pm-15.00pm	14.00pm-15.00pm
Duration	1 hour (10 minutes each)	1 hour (10 minutes each)
Theme		
Organisation		
Moderator	Petar Bulat - Injuries at Work - Challenges in Registration	Nadica Fotev - Take Care of Yourself, Take Care of Your Mental Health: The Challenges of Mental Health in Modern Companies
Speakers	1. Evelina Marinova - Quantifying the Burden of CVS and MSDs: Findings from a Survey- Based Study 2. Katarina Stavrić - Air Pollution and Respiratory Health 3. Vesna Velić - Are the Digitalisation, Global Health and Aging Changing the Epidemiological Views on the World Health? 4. Lütfiye Tutkun - AI-based Occupational Safety in the Workplace	1. Jasminka Petrushevska - cont. 2. Gorjan Zivchevski - cont. 3. Zhaklina Chagoroska - Electronic Recording of Examinations in Occupational Medicine within "Moj Termin": Concept, Challenges, and Solutions 4. Urime Demiri - Shaipi - Preparing University Students for High-Stress Professions: A Longitudinal Study of Stress Management Education and Well- Being in a Public University
	Special Session - II	Special Session - VI
Time	15.00pm-16.00pm	15.00pm-16.00pm
Duration	1 hour (10 minutes each)	1 hour (10 minutes each)
Theme		
Organisation		
Moderator	Dragan Mijakoski - Designing Behavior-Based Safety Interventions for Climate-Exposed Workers: Lessons from the CliMent Action	Sasho Stoleski - Artificial intelligence as a catalyst for the development of a new era in workplace risk assessment
Speakers	1. Vesna Cekovska Debarlieva - Disability and Work 2. Natasha Stancheva - Workplace Depression: A Scientific Perspective 3. Aneta Atanasovska - Effects of Fatigue on Safe Driving Performance in Professional Drivers 4. Sakthivelraj Subramanian - Effectiveness of a Multidisciplinary, Evidence-Based Workplace Diabetes Management Program in a Large Steel Manufacturing Workforce: Outcomes from an ICMR-Collaborative Intervention Study	1. Mirjana Dimovska - Climate-sensitive mortality in the working-age population in the Republic of N. Macedonia 2. Natasha Teovska Mitrevska - Occupational Dermatoses in Health Workers 3. Fimka Tozija - Evidence Based Policy Intervention in Injury Control and Trauma Care 4. Thomas Birk - Lung cancer and Silicosis: Experiences of the German Porcelain Workers Cohort Study
	Networking	Networking
	16.00pm-16.20pm	16.00pm-16.20pm

Special Sessions		
	8th May 2026	9th May 2026
	Special Session - III	Special Session - VII
Time	16.20pm-17.20pm	16.20pm-17.20pm
Duration	1 hour (10 minutes each)	1 hour (10 minutes each)
Theme		
Organisation		
Moderator	Dragana Bislimovska - Establishing a Differentiated Strategic Framework for Workplace Physical Activity in North Macedonia: Addressing the Health Paradox through Evidence-Based Policy	Hana Brborović - Psychosocial Risk Prevention - Myth or Reality?
Speakers	1. Tea Samardžić - Workplace Risk Assessment for Pregnant Workers Exposed to Physical Exertion: Croatian Approach 2. Daniela Buklioska Ilievska - COPD in Working Population - Occupational Exposure, Level of Education, and Smoking Status 3. Ceyda Şahan - Burnout and Mental Health Disorders in the Workplace: What Matters for a Safe and Sustainable Return to Work? 4. Irina Cekova - Psychosocial Factors at Work and Health Complaints among Pharmacists	1. Jayashree R U - Understanding Work Ability in Automotive R&D Employees in India: A Cross Sectional Descriptive Study 2. Milan Petkovski - Towards a Safe and Healthy Working Environment in North Macedonia 3. Snezhana Milkovska - Ailanthus altissima and Ambrosia sp. - New Threat for Outdoor Workers
	Special Session - IV	Special Session - VIII
Time	17.20pm-18.20pm	17.20pm-18.20pm
Duration	1 hour (10 minutes each)	1 hour
Theme		The Global Sweatshop: Managing Worker Health in a Warming Climate
Organisation		SCOM
Moderator	Maja Panajotovic Radevska - Ergonomic Assessment in Occupational Medicine	Gogillan Sevaratnam
Speakers	1. L. Bouzgarrou - Biomechanical Constraints and Low Back Pain Among Tunisian Healthcare Staff 2. Nikolina Banjanin - The Relationship Between Magnesium and Hypertension in Working Population 3. Borislav Kondov - Breast Cancer in Working Population 4. Zorica Nanović - Pulmonary Tuberculosis as an Occupational Disease	1. Vishnumohan 2. Moazzam Zaidi 3. Norvil Mera Chu
10th May 2026		
Special Session - IX		
Time	9.00am-10.00am	
Duration	1 hour (10 minutes each)	
Theme		
Organisation		
Moderator	Goran Andonov - Assessment of Workplace Risk for Development of Chronic Respiratory Symptoms in Professional Drivers	
Speakers	1. Syrulwa Somah - Enhancing Occupational Health Curriculum in Higher Education: Innovations, Outcomes, and Future Directions — The Harbel College Experience 2. Sanja Latkoska - Health Risks Related to Long-term Occupational Exposure to Silica Dust 3. Solphia Francesca CHUA - Occupational Challenges and Physical Symptoms Experienced by Bus Drivers in Metro Manila 4. Elena Kolevska - Pollen Allergy in Installers: Impact of Occupat. Exposure on Sensitization	

Flash Talks	
10 th May 2026	
Flash Talks - I	
Time	10.00am-11.00am
Duration	1 hour (5 minutes each)
Speakers	1. Nagaraj K - Psychosocial Barriers to Physical Activity among R&D Employees in South India: A Cross-Sectional Study 2. Asuman Aslan Kara - Prevalence of Work-Related Musculoskeletal Disorders and Their Impact on Quality of Life in Individuals with Occupational Diseases 3. Amal Miladi - Healthcare Workers Tobacco Use: A Study among 852 Caregivers 4. Tanja Lelas - Implementation of Directive (EU) 2023/2668 into the Croatian Legal Framework: Worker Protection and Recognition of Occupational Diseases Caused by Asbestos Exposure 5. Ivana Katnić - Prevention of Workplace Violence 6. Jinky Leilanie LU - Increased Chemical Exposure from Small Scale Gold Mining due to Climate Change 7. Igor Cenevski - Occupational Voice Disorders in Vocal and Non-Vocal Professions – An Occupational Medicine Perspective 8. Dilşad Akal Yilmaz - Women in the Interplay of Occupational Safety Culture and Marketing Communication: A Case Study from the Turkish Textile Industry 9. Tatjana Mladenović - Ergonomic Injuries - Work-Related Diseases 10. Nurka Pranjić - Cancer-Related Depression and Anxiety among Outpatients in the First Year after the Confirmed Diagnosis
Networking	
11.00am-11.20am	
Flash Talks - II	
Time	11.20am-12.20pm
Duration	1 hour (5 minutes each)
Speakers	1. Mohammed Taque Ansari - Acupuncture for Pain Management in Evidence-based Medicine 2. Jayandran Mohan - Psychosocial Hazards in the HSE Training Institutions 3. Emmanuel Kairania - Evaluation of Non-Adrenergic - Non-Cholinergic Mediators in Response to Thermal Balance in Lifestyle Clients at Risk of Heat Illness 4. Asuman Aslan Kara - Physical Activity Impairment in Pneumoconiosis: The Additional Burden of Coexisting COPD 5. Ivan Spiroski - Impact of the Unfavourable Microclimate on the Health of Workers in the Construction Sector 6. Jinky Leilanie LU - Small Scale Gold Mining - Risk Assessment of Miners and the Environment 7. Iva Kalajdzic - Recognition of Chronic Lead Poisoning as an Occupational Disease - A Case Report 8. Mehrzad Ebrahemzadih - Associations of Sputum Eosinophilia with Pulmonary Function and Respiratory Symptoms in Bakery Workers 9. Sophia Francesca CHUA - Trends of Work-related Traffic and Vehicular Injuries in the Philippines from 2010-2020 10. Jovica Stepovic - Acute Ammonia Poisoning as an Occupational Injury: A Case Report 11. Nehra Mosorović - Relationship between Psychosocial Factors and Presenteeism among Teachers in Elementary and Secondary Schools

Poster Sessions		
	8 th May 2026	9 th May 2026
Time	11.00am-11.20am	11.00am-11.20am
Duration	20 minutes (3 minutes each)	20 minutes (3 minutes each)
Speakers	1. Amir Ali - Study of occupational stress as a psychosocial hazard at a Manufacturing Industry 2. Ana Ašković - Adenocarcinoma of the Lung in a Worker Employed in a Zone of Ionizing Radiation, Occupational Disease or Not - Dilemma 3. Brahem Aicha - Long-term sickness absenteeism among healthcare personnel in the Sousse region 4. Lamia Bouzgarrou - Occupational Risk Prevention and Safety Optimization: The Contribution of Ergonomic Intervention in a Screen-Printing Workshop 5. Branislav Marić - The Rule of Risk Assessments in Health Care Institutions	1. Brahem Aicha - Prevalence and Impact of Musculoskeletal Disorders among Physiotherapists in Sousse: A Cross-Sectional Clinical Study 2. Lamia Bouzgarrou - Socio-professional and clinical characteristics of silicosis in the private sector in central Tunisia 3. Ema Milić - Professional Burnout among Healthcare Workers 4. Fadwa Darid - Artificial Intelligence in Occupational Medicine: Opportunities, Risks, and Conditions for Responsible Integration — A Narrative Review 5. Manoela Bogdanova - Occupational Injuries in Bulgarian Healthcare Workers: Three-Year Analysis and Prevent. Measures
	8 th May 2026	9 th May 2026
Time	16.00pm-16.20pm	16.00pm-16.20pm
Duration	20 minutes (3 minutes each)	20 minutes (3 minutes each)
Speakers	1. Irina Toneva - Risk and Safety Measures for Hospital Pharmacists in the Process of Working with Antineoplastic Drugs 2. Valentin Hristov - Stress and Burnout Among Teachers 3. Danilo Kostic - Analysis of Morbidity among Health Care Workers Occupationally Exposed to Ionizing Radiation in an Oncology Hospital 4. Lamia Bouzgarrou - Work Status among Hodgkin Lymphoma Survivors: A Cross-sectional Study 5. Marjana Trkulja - The Role of Psychopathological Personality Traits in the Work Ability Assessment: The Experience of the Serbian Institute of Occupational Health	1. Neyrouze Ismail Hajri - Occupational Noise Exposure and Auditory Health in the Textile Industry 2. Fadwa Darid - <i>TMP-MAROC</i>: A Mobile Application to Improve Access to Occupational Disease Regulations in Morocco 3. Rahul Mohan - Impact of Winter Air Pollution Associated with Climate Variability on Lung Function among Office Employees in Noida, India: A Cross-Sectional Study 4. Latifa Ben Afia - Association Between Workers' Health and Adopted Physical Activity and Dietary Patterns: A Cross-sectional Clinical Survey 5. Marko Burić - Medical innovations in the 21st century advance the healthcare industry
	10 th May 2026	10 th May 2026
Time	11.00am-11.20am	11.00am-11.20am
Duration	20 minutes (3 minutes each)	20 minutes (3 minutes each)
Speakers	1. Aleksandra Nedelkovska Nikoska - Health Status and Psychophysical Fitness among Healthcare Workers Occupationally Exposed to Ionizing Radiation 2. Martina Atanasovska - Influence of Exposure to Pesticides on Biochemical Parameters in Orchard Workers 3. Dragana Bislimovska - Predictors of Turnover Intentions among Administrative Workers: The Impact of Family–Work Conflict and Engaging Leadership 4. Darko Jankoski - Impact of Extremely Low Frequency Electromagnetic Fields on the Health and Workability of Workers in High Voltage Power Lines and Substations 5. Ljubinka Damjanovikj - Psychosocial Hazards Among Nurses: A Case-Based Analysis of Verbal Abuse and the Role of Psychological Support	1. David Zdraveski - Assessment of Health Status and Work Ability among Electrical Switchgear Operators 2. Jovanka Arsovska - Occupational Asthma and work-related COPD 3. Daniela Todorovska Jovanovikj - Ears Condition in Candidates for Motor Vehicle Drivers in the Function of Security 4. David Zdraveski - Health Status and Work Ability in White Goods Service Technicians: A Cross-Sectional Study 5. Katerina Kostadinova - The Role of Mandatory Occupational Check-ups as a Diagnostic Tool: Early Detection of Acute Myeloid Leukemia in an Asymptomatic Worker - a Case Report

Poster Sessions		
	10 th May 2026	10 th May 2026
Time	12.20pm-13.00pm	12.20pm-13.00pm
Duration	40 minutes (3 minutes each)	40 minutes (3 minutes each)
Speakers	1. Martina Markova Juzevska - Prevalence of Burnout Syndrome Among Healthcare Professionals in North Macedonia 2. Irena Dimitrovska - The Persistent Phantom: Tracking Subclinical lead toxicity in a post-industrial landscape 3. Tatjana Manojlovic - Assessment of Cardiovascular Risk Among Police Officers Using the Score 2 Model 4. Verónica Gutiérrez-Cruz - Silent Crisis in Healthcare: High Rates of Depression and Anxiety Among Hospital Workers in Mexico 5. Vildane Lusjani - Diseases of the Musculoskeletal System Related to Occupational Exposure 6. Dejan Bojkoski - Night Work and Metabolic Parameters: Independent Association with Total Cholesterol, but not with TyG Index after Adjustment 7. Jordan Babunovski - Preventive Medical Examinations and Occupational Health among Firefighters 8. Mihaela Isajevska - Climate Change, Mental Health and Allergies among Outdoor Workers: Results of a Literature Review 9. Nehra Mosorović - The Relationship between Distress, Food and Dietary Habits: A Review 10. Jovan Spasovski - Association of Sleep Deprivation and Burnout with Self-Reported Cognitive and Work Performance Outcomes among Early-Career Healthcare Professionals in North Macedonia 11. Kevica Klifova - Night Shift as a Risk Factor: Effects on Physical and Mental Health Among Emergency Medical Service Personnel 12. Rodna Jordanova - Chronic Impact of Fur Dust on Immune Status and Ventilatory Function	1. Mirjana Dzamic Nikolic - Prediabetes Among Serbian Railway Workers 2. David Zdraveski - Health Status and Work Ability of Teaching and Scientific Staff and Collaborators at a Higher Education Institution 3. Jinky Leilanie LU - Occupational Risk Exposures and Adverse Health Findings Among Farmers 4. Maja Belevska - A Review of the Workability and Social Burden Generated by Primary Open-angle Glaucoma (POAG) in Workers 5. Maja Belevska - Health-related quality of life (HRQL) and work ability in visually impaired people 6. Maja Belevska - Assessment of work ability in visually impaired people by using the Work Ability Index 7. Marija Balshevska-Vezenkoska - Occupational Trauma after a Fall from a Height - A Case Report 8. Kefayet Murselli - Correlation between Glucose Homeostasis, Lipid Profile and Biomarkers of Hepatorenal Function in Biochemical Screening in Humans 9. Lamia Bouzgarrou - Analysis of Psychosocial Risks: A Large Multi-Sectoral Study Based on the Siegrist Model 10. Emre Seyfulla - Work Ability Assessment of a Candidate for Employment in Security Services – Case Report 11. Ljubica Atanasova - Distribution of Breast Cancer According to Age, Occupation, and Histopathological Type: A Retrospective Study 12. Aferdita Kurti Meta - The Role of Healthcare Facility Visits as a Source of COVID-19 Transmission in Kosovo

8th May 2026 (Friday)

14.00pm-15.00pm Parallel Session: Meeting of the ICOH National Secretaries

9th May 2026 (Saturday)

11.30am-13.30pm Parallel Session: Meeting of the SEE Network on Workers' Health

OPENING LECTURES



Outdoor work and exposure to UV radiation in the climate change era: occupational risks and health surveillance

Author: Alberto Modenese

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Outdoor workers (OW) are increasingly exposed to hazardous environmental conditions due to climate change. Prolonged exposure to solar ultraviolet radiation (UVR) significantly raises the risk of skin and eye diseases, while rising temperatures contribute to heat-related illnesses and fatalities. Additionally, extreme weather events—such as wildfires, storms, and floods—represent a growing threat to occupational safety.

These risks not only result in acute injuries but also in chronic health outcomes. Long-term heat exposure is associated with cardiovascular and kidney diseases, while psychological disorders such as post-traumatic stress may affect survivors and rescuers of extreme events. Among chronic occupational diseases, cumulative UVR exposure is a major contributor, linked to conditions including ocular melanoma, cataracts, pterygium, and various skin cancers. Notably, non-melanoma skin cancers (NMSCs)—especially squamous and basal cell carcinomas—are, with actinic keratosis and photoaging, the most common occupational diseases linked to UVR. According to WHO and ILO estimates, 1.6 billion workers are exposed globally, with nearly 19,000 annual deaths and over 500,000 DALYs lost due to NMSCs.

In this context, climate change is redefining OSH challenges. Comprehensive, evidence-based strategies are essential to protect outdoor workers and ensure safe working environments under evolving environmental conditions, and these new scenarios have to be properly taken into account when designing adequate occupational health surveillance programs targeting OW.

Given that OW constitutes nearly half of the global workforce, urgent actions are needed. Key priorities include enhancing research on chronic heat and trauma-related conditions, improving disease burden estimates, strengthening disease reporting systems, and promoting inclusive preventive measures that cover OW in informal economies. Emergency preparedness should also be reinforced to address the increasing frequency and severity of climate-related events. Effective protective measures to reduce the impact of photochemical cumulative damage in the eyes and skin of OW caused by solar UVR are urgently needed.

Keywords: solar radiation; skin cancer; cataract; outdoor work; climate change

The Future of Work: Occupational Medicine to Digital Transformation, AI tools and Remote Work

Authors: Milan Milosevic, Roko Zaja, Hana Brborovic

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Background: Rapid digital transformation, including widespread remote and hybrid work, is reshaping work organization, exposures and surveillance, with work-from-home stabilizing at about one day per week globally and around one fifth of workers in some economies working primarily remotely. In parallel, artificial intelligence (AI) and digital occupational health interventions are entering practice, enabling real-time monitoring and predictive analytics but also raising concerns about technostress, data protection and algorithmic bias.

Objectives: This work aims to synthesize emerging evidence on how digital transformation, AI tools and remote work affect workers' health and safety, and to outline future roles and competencies for occupational medicine in a human-centred "future of work".

Methods: A narrative review of peer-reviewed literature from 2019–2025 was conducted, focusing on AI-driven occupational health and safety, digitalized health surveillance, remote and hybrid work, and digital psychosocial risks, complemented by key policy and professional position papers.

Results: Three main domains emerged. First, digitalization and remote work alter exposure profiles, with increased sedentary behavior, digital burnout, technostress and blurred work–life boundaries, particularly in knowledge and care sectors. Second, AI-enabled systems and digital occupational health interventions support continuous risk assessment, ergonomic monitoring, and tailored prevention, with early reports of reduced musculoskeletal disorders and improved surveillance efficiency. Third, pervasive data collection and algorithmic management introduce new ethical, organizational and legal challenges, requiring occupational physicians to move from a predominantly clinical focus toward governance of work systems, algorithms and organizational design.

Conclusions: Occupational medicine is pivotal for steering digital transformation toward health-promoting work, by integrating AI-based tools into evidence-based, ethically governed prevention, strengthening competencies in digital ergonomics and data literacy, and co-creating remote and hybrid work models that preserve autonomy, equity and well-being.

Keywords: Occupational Medicine, Digital Transformation, Artificial Intelligence, Remote Work

Cancer and Work Capabilities: Navigating Challenges and Opportunities in Occupational Medicine

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As advancements in oncology continue to improve survival rates, the intersection of cancer and work has become a critical focus for occupational health practitioners. This presentation explores the multifaceted impact of cancer and its treatments on work capabilities, moving beyond the binary "fit or unfit" assessment toward a more nuanced, functional approach. The presentation identifies three primary domains of impairment: physical (fatigue, pain, and reduced stamina), cognitive (concentration difficulties and memory challenges often referred to as "chemo-brain"), and emotional (stress and anxiety related to job navigation and recurrence). Through structured case studies, we examine the practical application of workplace accommodations across diverse roles—ranging from high-level financial analysis to manual manufacturing.

Key strategies for occupational physicians are highlighted, including the implementation of temporal flexibility, environmental modifications, and task restructuring. The session emphasises the necessity of interdisciplinary collaboration between medical teams, human resources, and management to foster supportive workplace cultures. Ultimately, this presentation provides evidence-based insights into how proactive medical-vocational coordination can preserve professional identity and enhance the quality of life for cancer survivors in the modern workforce.

Keywords: Cancer Survivorship; Work Capability; Occupational Physician; Return-to- Work; Workplace Accommodations; SCOM.

PLENARY SESSIONS



AI, Automation & Ergonomics: Redefining Occupational Health in Human Machine Collaboration

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Introduction: The rapid adoption of artificial intelligence (AI) and automation is transforming workplaces globally, reshaping how humans interact with tasks, tools, and environments. While these technologies enhance efficiency and precision, they also redefine occupational risks. This transition demands a shift toward human entered design and the integration of ergonomics within AI driven systems to ensure safe and sustainable work environments. **Current Scenario and Emerging Challenges** Global estimates suggest up to 30% of work activities could be automated by 2030, with major workforce transitions anticipated. While automation boosts productivity and reduces hazardous tasks, it also brings challenges such as increased cognitive workload, sedentary behaviour, digital fatigue, and technostress. Many workers express concerns about job security and evolving skill requirements. Issues related to data privacy, algorithmic management, and workforce acceptance remain key barriers to effective AI integration. **Impact on Occupational Health and Ergonomics** is evolving from physical to cognitive and digital domains. AI-enabled tools, including wearables and predictive analytics, are associated with improved monitoring of fatigue and early risk detection. Musculoskeletal disorders still account for nearly 30-40% of occupational disease burden globally. Collaborative robots have been associated with improved productivity and reduced worker strain when safely implemented. **Human-Machine Interaction and Future Workforce** AI excels in data processing and repetitive tasks, while humans contribute judgment and adaptability. Effective interaction depends on training, trust, and participatory design. Occupational health professionals play a key role in managing psychosocial risks and guiding safe technology integration.

Conclusion: AI and automation are transforming, not replacing, human work. A human-centric approach integrating ergonomics, ethical AI use, and occupational health leadership is essential to ensure that technological advancements enhance worker safety, wellbeing, and productivity in the evolving digital economy.

Keywords: Artificial intelligence, Automation, Human-Machine Interaction, Cognitive Ergonomics

Assessing Workplace Personal Chemical Exposure: Monitoring Technologies and Comparative Data in the Western Balkans

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Introduction: As the Western Balkan countries continue the harmonization of their Occupational Health and Safety (OHS) regulations with the European Union (EU) Acquis, the acquisition of precise, high-resolution personal exposure data has become increasingly essential. This study transcends theoretical risk assessment by examining a significant proprietary dataset containing over 400 personal exposure records gathered from the region in recent years. This documentation encompasses the examination of both particulate matter (PM) and gaseous pollutants across various industrial sectors, including construction, mining and mineral processing, cement production, and heavy manufacturing.

The research methodology utilizes a comprehensive approach that merges advanced personal exposure monitoring with an intricate analytical suite. The study utilizes X-ray fluorescence (XRF), X-ray diffraction (XRD), and scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM-EDS) for thorough characterization of the captured contaminants. This multi-tiered approach enables the identification of elemental composition, mineralogical phases, and particle morphology—details that are often overlooked by traditional gravimetric methods. Furthermore, data processing and trend analysis are performed using an R-based framework, ensuring statistical rigor and reproducibility.

This study benchmarks the regional database against European exposure criteria to identify specific "high-risk" zones where personal exposure levels substantially surpass international safety standards. The findings suggest that although legislative alignment is advancing, the exposure profiles in the Western Balkans necessitate enhanced, real-time monitoring infrastructure and focused, data-driven intervention strategies. This work highlights the critical need to align legislative targets with actual workplace conditions in order to effectively safeguard worker health throughout the region.

Keywords: Occupational exposure, Western Balkans, particulate matter, XRF, XRD, SEM, personal monitoring, OELs.

Climate change and workplace heat stress: call for action

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Climate change is increasing the frequency, intensity and duration of extreme heat events, creating escalating risks for workers in both outdoor and indoor settings. Workplace heat stress has emerged as a major public health, occupational safety and socioeconomic challenge, with implications for morbidity, mortality, labour productivity and equity. The labour productivity declines by 2–3% for every degree above 20°C, while heat exposure is associated with heatstroke, dehydration, kidney dysfunction and neurological disorders. Globally, more than 2.4 billion workers are exposed to extreme heat, resulting in an estimated 22.85 million occupational injuries annually.

Responding effectively requires the development and implementation of heat action plans tailored to local climatic conditions, sector-specific risks, work intensity and worker vulnerability. Priority attention should be given to workers at increased risk, including older workers, people with chronic conditions and those with lower physical fitness. Effective prevention also depends on education and awareness for workers, employers, health professionals and first responders, alongside stronger recognition, prevention and management of heat-related illness. Co-creation across sectors is essential, engaging employers, workers, trade unions, occupational health experts, meteorological services, public health authorities and local governments. Measures should be feasible, affordable, scalable and environmentally sustainable, and supported by innovation, surveillance, monitoring and evaluation.

This policy operationalizes WHO/Europe's EPW2 commitment to climate and health action by addressing occupational heat exposure, reducing heat-related health risks, and strengthening preparedness, prevention and resilience in the workplace. This call for action is further reinforced by the forthcoming second edition of WHO guidance on Heat–Health Action Plans, which supports actionable, multisectoral planning for populations at increased risk, including workers, through strengthened governance, early warning systems, risk communication, health-system resilience, exposure reduction and continuous learning.

Keywords: climate change; extreme heat; workplace heat stress; workers' health; heat-health action plans

Protecting the source: Medical Surveillance Best Practices in Peru's Blueberry and Grape Sector

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Objective: The purpose of the study was to describe best practices for medical surveillance based on workers' exposure in the blueberry and grape sector in Perú.

Material and Methods: This research was a case report study in a blueberry and grape farming company which had 858 workers. The unit of analysis included the indicators of characteristics of participants (demographic, level of education, gender, job position, etc.), risk assessment based on process, labor inspections, interviews in focus groups, questionnaires solved, education methods used, job accidents investigations, personal protection equipment (PEE), medical records of workers, internal audits, among others. It also analyzed the impact of the OHS on the frequency of accidents and illnesses in workers and on absenteeism for 5 years. The instruments used were Data collection sheet and Occupational health and safety (OHS) records.

Results: 858 workers participated, of which 63% were between the age of 30 and 50 years old and 34% were younger than 30. 64% lived in a rural area with low income. Each year, the OHS programs were adapted based on the updated risk exposure assessment (due to process modifications each year). The most common causes of job injuries were accidents related to chemical and mechanical risk factors. The most common types of diseases were Infectious and dermatologic. By the end of the fifth year, the frequency of accidents was reduced by 18%, the frequency of diseases and comorbidities was reduced by 26% and absenteeism was reduced by 18%.

Conclusion: Medical surveillance based on workers' exposure for 5 years, had good results in decreasing diseases and job injuries in workers in a blueberry and grape sector in Peru. Modifying process brought changes in risk exposure so proactive and dynamic medical surveillance was crucial.

Keywords: practices; medical surveillance; farming; blueberry; grape

Occupational Toxicology and Surveillance: What You Need to Know

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Occupational exposure to chemical hazards continues to pose significant risks to worker health across diverse industries, necessitating a clear and practical understanding of occupational toxicology and surveillance strategies. This presentation provides a clinically focused overview of key toxicological principles, including routes of exposure, dose–response relationships, and the systemic effects of commonly encountered workplace chemicals.

Drawing on occupational medicine experience from both New Zealand and Canada, the session explores the distinction and interplay between occupational surveillance and health monitoring. Occupational surveillance is presented as a population-level, preventive approach used to identify exposure trends and inform regulatory and workplace controls, while health monitoring is examined as an individual-level clinical process aimed at the early detection of adverse health effects.

The role of biological monitoring as a bridge between exposure and physiological effect is discussed alongside practical considerations for programme design, implementation, and interpretation. Examples are drawn from two regulatory contexts: New Zealand’s Health and Safety at Work Act 2015 and Canadian federal and provincial systems. Emphasis is placed on clinical application, including referral pathways, fitness-for-work assessment, and return-to-work decision-making.

This presentation aims to equip clinicians with a practical approach to managing occupational chemical exposures and implementing effective surveillance and monitoring programmes in their own settings.

By the end of this session, participants will be able to:

1. Describe key principles of occupational toxicology, including routes of exposure and dose–response relationships.
2. Differentiate between occupational surveillance and health monitoring in workplace settings.
3. Interpret the role of biological monitoring in linking exposure to health outcomes.
4. Apply practical approaches to clinical assessment, referral, and fitness-for-work decision-making for workers exposed to hazardous substances.

Keywords: Occupational toxicology, health surveillance, health monitoring, biological monitoring, workplace exposure, occupational medicine, New Zealand, Canada

A personal perspective on the use of Evidence Synthesis in Occupational Epidemiology

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Occupational epidemiology emerged as a science in the late 19th and early 20th centuries, with study design only being formalised around the mid 20th century onwards. Evidence synthesis at this stage was largely narrative. In the 1970s researchers began carrying out more structured literature reviews, with the term “meta-analysis” being coined in 1976 (in the context of educational research), marking a significant turning point in interpreting multiple studies. Meta-analysis in occupational epidemiology initially came to be used for carcinogens and chemical exposures. The rise of evidence-based medicine in the 1990s pushed occupational epidemiology towards systematic reviews. Organisations like the Cochrane Collaboration (founded in 1993) helped standardise methodology, albeit focussing on clinical topics. National and International bodies such as the International Agency for Research on Cancer (IARC) and the European Chemicals Agency used structured approaches to evidence synthesis for hazard classification. Evidence synthesis is now commonplace in occupational epidemiology. Methods have been expanded to include quantitative risk assessment, pooled analyses and umbrella reviews. Frameworks such as GRADE, risk of bias tools and methods for quantitative bias analysis are now the expectation of some journal editors. Regulatory agencies are relying heavily on synthesised evidence for workplace exposure limits. In this talk, I will present some of the evidence synthesis work I’ve been involved in during my career and its potential impact on research, policy and practice. Topics include ionising radiation, IARC priorities, shift working, concussion in elite sportspersons, occupational burnout, respiratory health surveillance, women’s occupational health and individual susceptibility.

Keywords: Occupational Epidemiology; Evidence Synthesis

Occupational and Environmental Health within One Health Paradigm – Implications and Opportunities

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Aim: This paper aims to explore the integration of occupational and environmental health within the One Health paradigm, emphasizing the interconnections among human, animal, and ecosystem health. It focuses on identifying common determinants of exposure, shared preventive strategies and emerging opportunities for cross-sectoral cooperation in addressing complex health challenges driven by environmental degradation and global change.

Material and methods: A narrative review and conceptual analysis were conducted, drawing on peer-reviewed literature, international policy frameworks, and case studies published between 2010 and 2025. Sources included WHO, ILO, FAO, UNEP, and European Environment Agency documents. An integrative synthesis approach was applied to map conceptual overlaps, policy coherence, and implementation gaps among occupational health, environmental health, and One Health domains. Illustrative examples from air pollution control, zoonotic disease prevention, and climate adaptation measures were examined to demonstrate the operational relevance of integrated approaches.

Results: Findings indicate that occupational and environmental health share common risk frameworks—such as chemical, biological, and physical exposures—that increasingly transcend traditional sector boundaries. The One Health paradigm provides a unifying platform to promote systemic risk assessment, surveillance, and early warning systems that capture human–animal–environment interactions. Collaborative governance models and workforce capacity building are identified as pivotal for preventing emerging zoonoses, addressing climate-related occupational risks, and ensuring sustainable resource use. However, institutional silos, limited intersectoral data exchange, and inconsistent policy enforcement remain key barriers.

Conclusions: Integrating occupational and environmental health into the One Health framework strengthens holistic prevention, resilience, and sustainability. Future directions should prioritize interprofessional education, harmonized monitoring, and policy alignment to foster health systems' capacity to manage human–environment interfaces. These efforts can transform fragmented health protection into a coherent response to global environmental and occupational challenges.

Keywords: Occupational health, Environmental health, One Health, Human–animal–environment interface

The Evolution of Occupational Health Systems: Integrating Policy, Education, Clinical Vigilance, and Preventive Action in a Changing Global Environment

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While the central goal of occupational health remains the continuous improvement of workers' well-being, the path to achieving it is increasingly dictated by a volatile global landscape. Drawing on over 40 years of experience, the evolution of occupational health systems at national and global levels is marked by three critical dimensions of a single "line of progress": the external force, the internal engine, and the practical outcome. In the Macedonian context, this line of progress begins with an external force representing our changing environment. Socioeconomic factors, crises, climate change, and digital transformation create "plus and minus" movements that render traditional safety models insufficient. To navigate these pressures, our internal engine must be resilient. This system integrates academic excellence at the Medical Faculty with newly established policy frameworks, aligning national legislation with WHO, ILO standards and EU directives through the institutional leadership of the Institute of Occupational Health. The practical outcome is the conversion of clinical vigilance into immediate field prevention action. By shifting the professional focus, we can effectively mitigate emerging risks—from occupational cancers and allergies to psychosocial stress and biological threats. This evolution marks a historical transition: we are no longer merely protecting workers from machines, but protecting them within a complex global ecosystem. This process should be supported by international cooperation and networking, a good example of which is the SEE Network on Workers Health. The network, demonstrating regional synergy, serves as a vital platform for collaboration in the field. This "single-line" approach offers the definitive blueprint for a future-proof occupational health system in the R. N. Macedonia. Led by a new generation of OH professionals, it unites national expertise with international cooperation to protect the workforce in an unprecedented global transition.

Keywords: Global Transition, Emerging Occupational Risks, Regional Cooperation, Policy Frameworks, Occupational Health and Safety

A novel questionnaire and algorithm for improved detection of occupational asthma in workplace-based medical surveillance

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Work-related exposures contribute to one in six new-onset adult asthma cases. A valid and standardized work-related asthma (WRA) questionnaire is needed for workplace surveillance and epidemiological studies. The scientific evidence for WRA questionnaires and algorithms used at primary workplace level was reviewed and a standardized instrument for surveillance developed. The questionnaire is primarily designed for workplace surveillance and epidemiological studies. It is informed and guided by validated questions and algorithms identified from the literature review by a team of experts. Asthma evaluation occurs in two components, initially obtaining information on general asthma questions followed by the presence of work-related asthma symptoms. Specificity for WRA increases if symptoms occur at work or immediately on returning home from work, improve with extended periods away from work, and if work-related ocular-nasal symptoms are present. The algorithm outlines the process for evaluating symptomatic workers and their detailed clinical evaluation. This includes specialist referral to obtain relevant clinical and occupational histories and further diagnostic tests to confirm the presence of occupational asthma. The next step of the process in this project is to initiate multinational collaborations to translate the questionnaire in different languages, including transcultural validation thereof. Furthermore, evaluation of the performance and validation of the full instrument in workplace-based medical surveillance is required to enable further refinement and clinical relevance in WRA prevention and management.

Keywords: work-related asthma, surveillance, questionnaire, algorithm

Occupational lung diseases: where are we now?

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Occupational lung diseases (OLDs), besides occupational skin and musculoskeletal diseases, remain the most frequent work-related diseases worldwide. OLDs cover entire spectrum of respiratory diseases ranging from asbestos-related diseases (ARDs), silicosis, coal workers' pneumoconiosis (CWP), and byssinosis to asthma, chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis (HP), lower respiratory infections (LRIs), lung cancer and pleural mesothelioma.

The lungs possess a limited repertoire of patterns of pathologic responses and disease manifestations are common to lung disease from both occupational and other causes. Except in etiology, there are no differences in histological changes, diagnostic approach and therapeutic modalities between occupational and non-occupational lung diseases. Epidemiological studies of OLDs have been conducted for more than a century. The monocausal diseases such as silicosis and ARDs are almost exclusively associated with occupational exposure and trends over time and the distribution of different industries and geographic areas can be evaluated efficiently through national registries of occupational diseases. On the contrast, for multicausal diseases such as occupational asthma, COPD and lung cancer, reliable information can only come from well-designed epidemiological studies. As OLDs are potentially preventable, prevention efforts are of a great importance. These diseases are, in principle, easier to prevent than diseases caused by genetic factors, lifestyle factors, or by the general environment. It is easier to intervene legally and technically in the work environment than in personal habits (such as smoking) or in major societal issues (such as transport). Besides this, OLDs still remain a substantial proportion of overall lung diseases and a great challenge for public health at global level.

Keywords: asthma, COPD, lower respiratory infections, lung cancer, pneumoconiosis, work-related lung diseases.

Determinants of ageism and ageism behaviour among older employees

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Ageism at the workplace occurs when older workers, more than 55 years old, suffer discriminatory behavior from colleagues that separates, stigmatizes them, and jeopardizes their professional standing based on age-related negative stereotypes at the workplace. Objective: to determine ageism behaviors through interdisciplinary perspectives; to analyze characteristics of exposure to negative behaviors, which should be part of the questionnaire for screening ageism during creative workshop sessions among interdisciplinary, international experts. We used a brainstorming method, a workshop, and the Mini Delfy technique in three groups of 5 international experts in the field. We discussed the applicability of various ageism concepts to the study aims. The phenomenon that we have investigated has the following features: the intention is not always clear; it is moderately intensive; it consists of verbal assault and threats; it is repeated behaviors; and positioning older workers- victims in an inferior position and isolation. Ageism discriminative behaviors: deprived of training; accused of being slow; accused of taking sick leave; perceived to be unsocial; seen as empathic but not competent; perceived as not innovative; not able to multitask; accused of having lower cognitive abilities; not able to work under pressure; not able to use modern technology efficiently; comment about physical appearance; being recommended to leave organization; and work station adjusted for younger employees. Age discrimination persists even though older workers are not necessarily less healthy, less educated, less skillful, or more productive than their younger counterparts. It is necessary to leave work according to the legally prescribed age!

Keywords: ageism, age discrimination behavior, older workers, Mini Delfy technique in three groups of 5 international experts

Travel Medicine in Occupational Health - Medical Care for Business Travellers

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In today's globalized economy, business travel is increasing, exposing employees to specific occupational health risks that require specialized management. Occupational health care is essential to ensure employee safety, wellbeing, legal compliance, and last but not least business continuity. Business travellers can be domestic, short-term or long-term international, or expatriates. Their risk profile includes physical risks (such as fatigue, jet lag, infectious diseases, and food/water safety), psychosocial risks (stress, burnout, isolation, work-life imbalance), and environmental and safety risks (road safety, climate extremes, political instability, crime,). Individual factors like pre-existing medical conditions, age, fitness, and vaccination status further influence risk.

In Europe, employers have a legal duty of care, requiring compliance with occupational health and safety legislation, travel health regulations, and international standards such as ILO recommendations and the new ISO 31030 guidance. This includes pre-travel risk assessments, health surveillance, emergency and repatriation planning, and adherence to national and international guidelines.

Best practices in occupational health interventions span the entire travel cycle:

- Pre-travel: Medical assessments, fitness-to-travel clearance, vaccinations, and risk briefings.
- During travel: Access to medical support, emergency assistance, and strategies for managing physical incidents and mental stress.
- Post-travel: Health monitoring, follow-up, and support for reintegration.

Occupational health services are responsible for conducting risk assessments, providing medical advice, supporting mental and physical wellbeing, and monitoring health trends. Company management must establish robust travel health and safety policies, offer a hotline for medical and security incidents, ensure compliance, allocate resources, and foster a culture of health and safety.

In conclusion, business travel presents significant occupational health risks, but proactive risk assessment and prevention—especially regarding road safety, mental health, non-communicable diseases, and infectious diseases—are essential. Employers and occupational health services must collaborate to protect traveller health, thereby improving safety, productivity, and business continuity.

Keywords: travel medicine, business travellers, occupational risk

SEMI - PLENARY SESSIONS



The ICOH Journey

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The International Commission on Occupational Health (ICOH) is an international non-governmental professional society whose aims are to foster the scientific progress, knowledge and development of occupational health and safety in all its aspects. It was founded in 1906 in Milan as the Permanent Commission on Occupational Health. The ICOH is recognised by the United Nations as a non-governmental organisation (NGO) and has close working relationships with ILO and WHO.

Today, ICOH is the world's leading international scientific society in the field of occupational health low- and middle-income countries (LMIC) with a membership of more than 2,000 professionals from over 110 countries. ICOH charges a subsidized membership fee from members in low- and middle-income countries. ICOH has 37 Scientific Committees. Most of these committees have regular symposia, scientific monographs and review the abstracts submitted to the International Congresses. The most visible activities of ICOH are the triennial World Congresses on Occupational Health, which are usually attended by some 3,000 participants. The ICOH 2027 Congress will take place in Mumbai, India during February 14-19, 2027.

During the last few years, ICOH has dramatically increased membership from LMICs, improved gender balance in membership and leadership, increased diversity, stimulated actions and research through the Scientific Committees and lobbied for Occupational Health through international bodies including ILO/WHO. The presentation will describe the story of ICOH's history, conception, transitions, successes and challenges. As the world is changing with reversal of rules-based order, conflicts and wars, economic collapse and increasing intolerance, occupational health is among the first casualties. There are an increasing role and relevance for ICOH.

Keywords: ICOH, Occupational Health, International Health

Safety and Health at Work for Aging Workforces

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The global workforce is undergoing a significant demographic shift, with a substantial increase in the number of older workers, especially in Europe, which is expected to increase over the coming years. This trend is driven by various factors, including changes in population demographics, advancements in healthcare, and shifts in retirement patterns. The prospect of a longer working life raises the question of providing good quality of occupational safety and health (OSH) for all workers in order to ensure healthy workforces for the future, and from the other side poses serious challenges for OSH. Older workers bring a wealth of experience and skills; however, they also have unique needs and characteristics, such as age-related changes in the musculoskeletal, cardiovascular system, vision, hearing, etc., possible chronic diseases, lower tolerance towards a variety of physical factors, etc. The challenge is not merely the age, but overlapping of age, health conditions and occupational risks. Especially vulnerable are the aging employees with incapacity, occupational, work-related and/or non-communicative chronic diseases. Actions are needed in the management of different exposures, often multiple, as shift and night work, overtime, high work load, difficult work postures, physical and chemical factors, etc. Creation of age-friendly workplaces along with workplace health promotion, achievement of work-life balance and finally good capacities of health- and OSH sub-systems in particular, to respond to the increasing needs of older employees will contribute for integration of different age workforces, which can bring to productivity and benefits for both workforces and organizations.

Keywords: Aging workforces, health, OSH, workplace exposures

Endocrine Disruptors from Toxicological Point of View

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Endocrine disruptors (EDs) are exogenous chemicals that interfere with hormone synthesis, secretion, transport, binding, or elimination in humans and wildlife. These substances include industrial chemicals such as bisphenol A (BPA), phthalates, polychlorinated biphenyls (PCBs), pesticides, heavy metals, and certain pharmaceuticals. EDs can mimic natural hormones, block hormone receptors, or alter hormone metabolism, leading to adverse health outcomes even at low-dose exposures.

The primary concern stems from their ability to disrupt critical developmental processes, particularly during vulnerable windows such as fetal development, infancy, and puberty. Scientific evidence links ED exposure to reproductive disorders, neurodevelopmental impairments, metabolic dysfunction including obesity and diabetes, immune system alterations, and hormone-dependent cancers. The "low-dose hypothesis" and non-monotonic dose-response relationships challenge traditional toxicological paradigms, as effects may occur at environmentally relevant concentrations below conventional safety thresholds.

Occupational exposure represents a significant risk pathway, particularly in manufacturing, agriculture, and chemical industries where workers face higher ED concentrations. Environmental contamination through industrial discharge, agricultural runoff, and consumer product degradation results in widespread population exposure via ingestion, inhalation, and dermal absorption.

Addressing ED risks requires integrated approaches combining regulatory frameworks, biomonitoring programs, workplace exposure controls, and public health interventions. The precautionary principle guides risk management given scientific uncertainties regarding mixture effects and transgenerational impacts. Future research priorities include identifying emerging EDs, elucidating mechanisms of action, and developing sensitive biomarkers for early detection. Implementing comprehensive occupational hygiene measures and promoting safer chemical alternatives remain critical for protecting workers and public health.

Keywords: endocrine, toxicology, biomarkers

Health Examinations for Class 1, Class 2, and Class 3 in Aviation Medicine - the Role of Occupational Medicine Specialist

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Aviation medicine is a specialized discipline within preventive medicine that focuses on preserving the health and psychophysical fitness of aviation personnel while safeguarding flight safety. Medical certification through Class 1, 2, and 3 examinations is required for commercial pilots, private pilots, parachutists, recreational pilots, other flight crew members, as well as air traffic controllers. Regular medical assessments of these professionals are essential for ensuring the safety and reliability of civil aviation operations. The Authorized Aviation Medical Examiner (AME) plays a critical role in this process by conducting standardized medical evaluations, assessing aeromedical fitness, and determining eligibility for the issuance or renewal of medical certification.

Historical Background: The development of aviation medicine has been closely linked to the growth of civil and military aviation throughout the 20th century. Initially, the primary focus was on preventing accidents caused by pilots' physical and psychological conditions. Over time, standards and regulations have become internationally harmonized through organizations such as the International Civil Aviation Organization (ICAO) and the European Union Aviation Safety Agency (EASA).

Regulatory Framework: The aeromedical certification process is regulated by both international and national aviation authorities in accordance with established medical standards. In Serbia, examinations are conducted at authorized medical institutions by physicians licensed by the Civil Aviation Directorate (DCV) and are harmonized with EASA Part-MED regulations and ICAO standards.

Aim of the study: The aim of this paper is to present the definition, regulatory framework, examination procedures, essential health requirements, certificate validity, and the overall significance of these assessments for flight safety.

Content: Medical examinations of aviation personnel enable regular evaluation of health status and early detection of conditions that could impair the ability to safely operate an aircraft. The frequency of examinations depends on the applicant's age, existing medical conditions, and any changes in health status, all of which must be promptly reported to the AME. Prior to the examination, the applicant's pilot license and previous medical certificate must be verified to confirm identity and review any medical limitations or restrictions. If the applicant does not possess these documents, the Aeromedical Section (AMS) of the competent authority must be contacted to verify eligibility and documentation requirements. The previous medical certificate also helps determine which tests are required for the current assessment (e.g., ECG). Once the verification process is complete, the applicant completes the official medical certification application form under the supervision of the AME. When properly completed,

the form is signed by both the candidate and the examiner. The AME then proceeds with the medical evaluation and completes the Medical Examination Report.

Medical Examination of Aviation Personnel includes:

- Detailed medical history and physical examination, including measurement of basic biometric parameters (height, weight, waist circumference, eye color, hair color, blood pressure, heart rate);
- Laboratory testing: urinalysis, complete blood count (CBC/Hb), and fasting glucose;
- Vision assessment: distance vision (5–6 m), intermediate vision (1 m), near vision (30–50 cm), with and without correction; refraction, visual field, color vision testing, and ophthalmoscopy;
- Hearing assessment: testing each ear separately at a distance of 2 m and by audiogram;
- Otolaryngological (ear-nose-throat – ENT) examination, lung function testing when indicated and additional investigations depending on specific risks;
- Electrocardiogram (ECG) during the initial examination and periodically thereafter;
- Cardiovascular, neurological, and psychological status evaluation.

Responsibilities of the Aeromedical Examiner (AME)

The AME, who holds a specialized qualification and a license issued by the competent authority, is responsible for:

- Ensuring clear communication with the applicant without language barriers;
- Informing the applicant about the consequences of providing incomplete, false, or misleading information;
- Notifying the competent licensing authority if false or incomplete information is provided or if the applicant withdraws the medical application at any stage.

After completion of the examination, the AME must:

- Inform the applicant whether they are assessed as fit, unfit, or require referral to the authority's medical assessor;
- Explain any limitations or restrictions affecting training or operational privileges;
- Notify the applicant of their right to appeal in the event of an "unfit" decision;
- Submit a detailed, signed (or digitally certified) medical report to the authority's medical assessor without delay, including copies of the application, medical report, and medical certificate;
- Advise the applicant of their responsibility to report any subsequent decrease in medical fitness.

According to ICAO guidelines, when standards and recommended practices do not sufficiently cover individual situations, the AME's professional judgment becomes crucial. The medical assessment must therefore be conducted in accordance with the highest standards of medical practice.

Recommendations and Implications:

- For applicants: It is important to prepare relevant medical documentation in advance, maintain good health, and consult an AME regarding any medical concerns.
- For organizations and regulators: Continuous monitoring and updating of standards, clear communication with applicants, and education on the importance of aeromedical certification are essential.

- For future research: statistical analysis of certificate denials or deferrals”, identification of the most common medical causes, and comparison across countries or regional regulations would be valuable.

- All personnel involved in aeromedical examinations and certification must ensure strict confidentiality of medical information at all times.

Conclusion: Aviation medicine plays a critical role in maintaining flight safety. Class 1, 2 and 3 medical examinations form a fundamental element of the health control system, while the expertise and responsibility of the AME are vital for accurate medical fitness evaluation. Continuous education, standardization, and collaboration with regulatory authorities are necessary for further improvement of the quality, reliability, and consistency of aeromedical assessments.

Keywords: aviation medicine, medical examination, medical fitness, flight safety, medical certification, EASA standards, ICAO, EASA Part-MED.

The rising epidemic of silicosis from artificial stone: a call for action

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Aims: Artificial stone has become increasingly popular in many countries over the past 20 years as a material for kitchen and bathroom bench tops. It contains up to 95% crystalline silica, which is much higher than in natural stones, and includes resins and dyes. The aims of this study were to identify the risk of developing silicosis and related diseases in stonemasons working with artificial stone and to compare the effectiveness of chest x-rays and CT scans as a screening tool.

Material and methods: A registry of 1238 stonemasons was established. Data were collected by a respiratory questionnaire, occupational history with a focus on silica exposure and work methods, respiratory function tests, a chest x-ray and/or low dose CT scan and a blood test to examine autoimmune markers.

Results: 24.3% of the subjects were diagnosed with silicosis. Most subjects used dry cutting and other poor work methods when using artificial stone which put them at high risk of developing silicosis. The average age was 42 years and many were immigrant workers. 24.6% had detectable Anti Nuclear Antibodies, suggesting them being at risk for autoimmune diseases. Chest x-ray was found to have low sensitivity to detect the early changes of silicosis when compared with low dose CT scan. Respiratory function tests were within normal limits in most cases.

Conclusions: Working with artificial stone, especially when using dry cutting and inadequate ventilation, leads to a high risk of developing silicosis and other silica-associated diseases. Medical screening of exposed workers should include low/ dose CT scanning rather than chest x-rays. Control measures should follow the hierarchy of controls, with elimination as the most effective method. Based on research findings, Australia became the first country in the world to ban the use of artificial stone and we urge other countries to do the same.

Keywords: Silicosis, artificial stone, medical screening

Screenism in the Digital Age: Digital Learning Practices and Their Influence on Creativity, Innovation, and Technical Reasoning in University Students

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The rapid digitalization of higher education has intensified students' reliance on screens as the primary medium for learning, researching and completing academic tasks. This phenomenon, referred to as screenism, extends beyond simple screen exposure and encompasses a broad range of digitally mediated learning activities, including the use of computers for coursework, online research for seminar papers, engagement with artificial intelligence tools, and the adoption of specialized technical software. As digital tools become deeply embedded in the learning process, questions arise regarding their influence on students' creativity, innovative capacity and the development of technical reasoning — core competencies for engineering and technologically oriented study programs. This study examines how extensive digital learning practices shape students' cognitive approaches to problem-solving, their ability to generate original ideas and their independence in research-based tasks. Through a mixed-method approach involving surveys, analysis of student assignments and observation of learning behaviors, the research aims to identify both the empowering and limiting effects of screen-intensive learning. Preliminary insights suggest that while digital access expands informational reach and accelerates task execution, it may also encourage surface-level processing, overreliance on automated tools and reduced engagement in deeper conceptual reasoning. At the same time, properly guided integration of digital resources can enhance student innovation by enabling rapid prototyping, simulation-based experimentation and exposure to diverse interdisciplinary content. The outcome of the study seeks to formulate practical recommendations for teaching strategies, blended-learning models and assignment design that balance the benefits of digital tools while mitigating screenism-related risks. The goal is to support a healthy digital learning environment that fosters creativity, strengthens technical logic and encourages meaningful student engagement in the age of pervasive screens.

Keywords: screenism; digital learning; creativity; technical reasoning; AI-assisted learning;

Mesothelioma- can we tame the shrew?

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Malignant pleural mesothelioma (MPM) is a rare tumor, directly attributable to all types of asbestos exposure, with a clear dose–response relationship, and is therefore both an industrial and preventable disease. The mean latency of MPM following asbestos exposure is 40 (15–67) years. Definitive diagnosis depends on precise imaging methods (chest CT) and invasive methods for obtaining histologic specimens. Specific tumor markers are not available; positive CEA can be an exclusion criterium. Histological subtyping and precise staging is necessary for determination of optimal management strategies. The treatment strategy should also take into account factors such as age, performance status, comorbidities and the patient's preferences. Treatment decisions should ideally be discussed within a multidisciplinary tumor board who are experienced in mesothelioma management. Although multimodality treatment is recommended, the treatment for MPM is not standardized. Surgery has a role in diagnosis, effusion control as well as cytoreduction. Classical chemoradiotherapy strategy has limited effect, especially in advanced disease. Introduction of bevacizumab as well as novel immunotherapy agents in adjuvant and neoadjuvant setting give a possible window for improvement of outcome and progression free survival of MPM patients.

Keywords: malignant pleural mesothelioma, management strategies

Третман на зависност од тутун кај работно способната популација во Македонија

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Пушењето е водечка причина за прерана смрт и инвалидност во Европа. Секоја година, повеќе од 700 000 жители на Европа умираат од болести поврзани со употреба на тутун. Во Македонија, 46.6% од мажите и 26.8% од женската популација се активни пушачи. Овие бројки ја става Македонија на високо место во Европа по стапката на пушење. Нема ништо поважно што можеме да направиме за пациентите кои пушат, од тоа да им помогнеме да престанат. Лекарите и здравствените работници мора да имаат предвид дека зависноста од тутун е медицинска состојба, а не навика, порок, задоволство или избор на стил на живот и дека треба да се дијагностицира и третира на ист начин како другите хронични болести. Повеќето пушачи не можат сами да се откажат од пушење (без стручна помош).

Зависноста од никотин е хронична релапсирачка состојба и има две компоненти: физичка зависност и психичка зависност. Интензитетот на зависноста од никотин значи дека многу пушачи кои ќе се обидат да се откажат од цигарите, повторно ќе посегнат по нив. Релапсот е најчест во првите неколку недели од откажувањето.

Водичите за третман на зависност од тутун од ENSP препорачуваат пет стратегии на справување со зависност од тутун во клиничката пракса. Познати како “5П” тие се: Прашајте ги сите пациенти за пушачкиот статус и внесете ги податоците во медицинското досие; Применете совет за пациентите кои пушат дека треба да престанат; Проценете ја подготвеноста за откажување; Помогнете во процесот на откажување, вклучително и давање совет за однесувањето и препишување лекови од прва линија за откажување од пушење; и Процесирајте следење.

За да дадеме придонес во процесот на намалување на употреба на тутун во Македонија, спроведовме програма за едукација на докторите и здравствените работници за третман на зависност од тутун. Проектот претставува партнерство помеѓу Медицинскиот факултет во Скопје и Henry Ford Health System од Detroit, Michigan, USA.

Клучни зборови: зависност од тутун, третман, превенција

SPECIAL SESSIONS



Injuries at Work - Challenges in Registration

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Injuries at work are often a companion to production activities. Due to the considerable detriment to employee health and financial losses for the employer, there exists a mutual interest in reducing workplace injuries. A fundamental prerequisite for establishing preventative programs is understanding the causes of injuries and analyzing injury statistics. The foundation for their evaluation is a reliable register of injuries at work. The trustworthiness of the work injury register is frequently dubious, constituting the primary issue in evaluating workplace injuries, as data inconsistencies might result in misguided policies and insufficient safety measures. A paradoxical scenario is evident when analyzing data at the European level: the prevalence of workplace injuries is highest in the most developed countries, despite their superior standards of occupational safety compared to less developed countries. This data may be linked to the fact that some countries don't report workplace injuries as much as they should, that injury registration systems don't work well, that there are different definitions of occupational injuries, and other reasons. To enhance the documentation of workplace injuries and facilitate the comparison of such injuries across EU nations, economic sectors, and enterprises, the EU commenced the development of a unified reporting methodology in 1990 and released the European Statistics on Accidents at Work (ESAW) in 2001, subsequently updated in 2012. The ESAW approach specifies injuries that are not classified as work-related and offers a clear definition for fatal work-related injuries and reportable injuries. The comprehensive integration of the ESAW approach into national legislation facilitates an assessment of the causes and sources of workplace injuries, hence allowing for the adoption of preventive measures.

Keywords: Injuries at Work, ESAW, Prevention of injuries at work

Quantifying the Burden of CVS and MSDs: Findings from a Survey-Based Study

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Introduction: Technological development and digitalization have led to significant changes in industry, economy, and daily activities. The use of video display terminals has become an essential part of daily life, playing an integral role in both professional activities and leisure time. Consequently, a rising number of people experience symptoms associated with prolonged screen use across various age groups.

Complaints related to working in front of a video display are collectively referred to as computer vision syndrome (CVS), also known as digital eye strain. CVS is a complex of ocular, visual, and extraocular problems related to near work during computer use.

Objective: To estimate the prevalence of CVS and musculoskeletal disorders (MSD) and their risk factors among people who spend their working day in front of a video display terminal.

Materials and methods: The study group included 448 individuals, who spend eight hours of work in front of a computer device. All the attendants filled in a specifically designed questionnaire in which the CVS-Q and the Nordic Questionnaire of MSD were integrated.

Results. The median age of the participants was 33years, IQR (28-40), 59% male, 41% female. At least one symptom of CVS was reported by 73,3% of the attendants. Over 85% of the whole group experienced more than one MSDs in the last year. The study identifies a significant correlation between individual demographic factors and MSDs, with age and total work experience acting as primary predictors for cumulative strain in distal areas.

Conclusion: As CVS and MSDs are increasingly recognized as significant occupational health concerns, greater attention should be directed toward their prevention and implementation.

Keywords: Computer vision syndrome, musculoskeletal disorders (MSD), prevalence, digital screen, ocular health workplace interventions aimed at reducing associated symptoms.

Air pollution and respiratory health

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Background: Air pollution is a major environmental health risk and a leading contributor to global morbidity and mortality. Exposure to ambient and household air pollutants is strongly associated with respiratory diseases, including asthma, chronic obstructive pulmonary disease (COPD), lung cancer, and respiratory infections. Urban areas in North Macedonia frequently experience high levels of particulate matter (PM_{2.5} and PM₁₀), often exceeding recommended limits. One study estimated ~1,200 premature deaths in Skopje alone (in one year) due to PM_{2.5}.
Aim: To examine the impact of air pollution on respiratory health and highlight opportunities for prevention and health system response.

Methods: Analysis of epidemiological evidence, national monitoring data, and international reports to assess the relationship between air pollution exposure and respiratory health outcomes.

Results: Short- and long-term exposure to air pollutants is associated with increased incidence and exacerbation of respiratory diseases. Elevated levels of PM_{2.5} and nitrogen dioxide (NO₂) are linked to worsening asthma symptoms, increased hospital admissions, and reduced lung function. Exposure to air pollution during gestation, infancy, childhood, and adolescence affects developing organs, and increases the risk of chronic disease in adulthood. Children are especially vulnerable to air pollution because they inhale more air than adults in proportion to their body weight, breathe closer to ground level sources of air pollution such as vehicle exhausts, and are less able to control their exposure than adults. Adults face higher risks of COPD and lung cancer. In North Macedonia, seasonal peaks in air pollution correlate with increased respiratory morbidity and healthcare utilization. Key pollution sources include traffic emissions, household heating, and industrial activities.

Conclusion: Air pollution remains a critical and preventable determinant of respiratory health. Healthcare professionals play a key role in raising awareness, identifying at-risk individuals, and advocating for policies that reduce exposure.

Keywords: air pollution, respiratory diseases, prevention

Are digitalisation, global health and aging changing the epidemiological views on world health?

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Historically, successes in improving human health have been rooted in diligent observation and careful analysis of the given situation and data. The digitalisation of public health systems offers new opportunities to strengthen health system resilience, improve population health, and enhance preparedness for future crises. The convergence of digitalisation, global health initiatives, and aging is radically changing epidemiological views on world health by shifting focus from reactive, infectious disease control towards proactive, data-driven management of chronic conditions and population-wide health surveillance. This transition, often characterized as a shift toward "digital-in-health" and "precision epidemiology" involves managing an aging population's complex health needs through real-time data, AI, and integrated, patient-centric technology. Data sharing tools and cloud computing are available for the epidemiologists for insights, and knowledge not previously available. These capabilities provided epidemiological research with nearly real-time information on morbidity and mortality statistics. The tools of precision epidemiology are already started to be used to explain individual variability in symptoms and enabled a more targeted approach toward disease control. The traditional epidemiological transition model—which suggested a linear shift from infectious diseases to chronic diseases—is being replaced by a more complex view characterized by a double burden of disease (communicable and non-communicable diseases coexisting) and the rise of chronic conditions in aging populations. Among new developments in epidemiology, precision prevention is a new concept and practice aiming to prevent chronic or infectious diseases by identifying and targeting individuals at high risk of developing disease. In light of new, solid evidence contradicting prevalent accepted beliefs, the field of epidemiology must remain dynamic and be open to new ideas that further evolve its growth and ultimately improve health.

Keywords: Digital epidemiology, Big data, causal inference, aging, population health, public health

AI-based Occupational Safety in the Workplace

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Artificial intelligence (AI) is revolutionizing occupational health and safety (OHS) by transforming traditional reactive approaches into predictive, data-driven systems. This paper examines the integration of AI technologies in workplace safety management, exploring their applications across hazard identification, risk assessment, incident prevention, and regulatory compliance. AI-powered systems utilize machine learning algorithms, computer vision, natural language processing, and predictive analytics to continuously monitor workplace environments, identify unsafe behaviors, and predict potential incidents before they occur.

Key applications include real-time monitoring through smart sensors and wearable devices that detect physiological stress indicators, environmental hazards, and proximity to dangerous zones. Computer vision systems analyze video feeds to identify safety violations, PPE compliance, and ergonomic risks, while machine learning models process historical incident data to identify patterns and predict high-risk scenarios. AI-driven platforms enhance emergency response capabilities, automate safety audits, and provide personalized training recommendations based on individual worker profiles and performance data.

The implementation of AI in OHS presents significant benefits including reduced incident rates, improved compliance monitoring, optimized resource allocation, and enhanced decision-making capabilities. However, challenges remain regarding data privacy, algorithm transparency, integration with existing safety management systems, and the need for specialized expertise. This study highlights successful case studies from high-risk industries including petroleum, manufacturing, and logistics sectors, demonstrating measurable improvements in safety performance metrics.

As Industry 4.0 advances, AI-based occupational safety systems represent a critical evolution in protecting worker health and well-being. Future developments will likely focus on increased automation, integration with IoT ecosystems, and enhanced predictive capabilities, fundamentally reshaping how organizations approach workplace safety management in the digital age.

Keywords: IoT, artificial intelligence, occupational safety

Designing Behavior Based Safety (BBS) Interventions for Climate Exposed Workers: Lessons from the CliMent Action

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Climate change is increasingly shaping occupational risk profiles, particularly for climate exposed workers such as those working outdoors or in high risk environments. Beyond physical hazards, climate related stressors contribute to psychosocial risks, including eco anxiety, cognitive overload, and impaired safety decision making. Behavior Based Safety (BBS) approaches offer a promising framework for translating awareness of these risks into observable, protective work behaviors.

Objective: This presentation aims to present a structured approach for designing and implementing climate responsive BBS interventions, drawing on emerging evidence and collaborative experiences from the COST Action CliMent (Climate Change and Mental Health).

Methods: Lessons from CliMent activities, stakeholder discussions, and interdisciplinary expertise were synthesized to develop a stepwise BBS intervention model tailored to climate exposed workers. The model integrates traditional BBS elements (observation, feedback, reinforcement) with climate specific physical and psychosocial risk factors.

Results: Key intervention components include: (1) identification of climate critical safe behaviors (e.g., hydration, PPE use during heat or smoke, safe decision making under stress); (2) worker participation in co creating behavioral norms; (3) integration of climate related mental health awareness into BBS training; and (4) reinforcement mechanisms that promote both physical and psychological safety. The approach emphasizes proactive coping behaviors and peer to peer support to mitigate climate related psychosocial strain.

Conclusions: Climate adapted BBS interventions can strengthen occupational resilience by addressing the behavioral and mental health dimensions of climate exposure. Integrating CliMent insights into BBS frameworks supports safer work practices, enhances worker engagement, and contributes to sustainable occupational health strategies under changing climate conditions.

Keywords: climate changes, mental health, outdoor workers, workplace safety, prevention

Workplace Depression: A Scientific Perspective

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Работните услови се тесно поврзани со општата и менталната состојба на вработените преку професионалниот стрес, што резултира со негативни емоционални искуства на работното место предизвикани од работни фактори, кои водат до развој на депресивно растројство

Цел: Ова истражување имаше за цел да ја анализира преваленцата на депресија кај работници во јавната и приватната администрација и раборниците во индустријата, како и да ја процени поврзаноста помеѓу симптомите на депресија и повеќе фактори, вклучувајќи демографски карактеристики, работна средина и животен стил. Исто така, целта беше да се испита предиктивната улога на избраните параметри за појава на депресија кај овие групи работници.

Методи: Самоадминистриран прашалник беше пополнет од примерок од три групи работници во Република Северна Македонија – Скопје (работници од три различни професионални средини). Вкупно 126 (50,8%) беа мажи, а 122 (49,2%) жени. Истражувањето ги опфати социодемографските карактеристики и менталното здравје (Patient Health Questionnaire-9). За проценка на поврзаноста помеѓу симптомите на депресија и демографските, работните и животните фактори беа користени логистички регресиони модели.

Резултати: Анализата на вкупниот PHQ-9 скор, поделен во две групи (≤ 10 и ≥ 10), покажа дека 89% од испитаниците имаат минимална/лесна депресија, додека 11% имаат умерена/тешка депресија. Беше утврдена значајна поврзаност помеѓу групата на која припаѓа испитаникот и степенот на депресија. Тешката депресија беше значајно поврзана со работа во јавни институции.

Заклучок: Депресијата е често ментално растројство кое влијае врз функционирањето, вклучително и врз работната способност, која е основно право и овозможува социјална интеракција и финансиска поддршка за поединецот. Скринингот за депресија кај работниците е неопходен поради нејзината висока застапеност и недоволна дијагностицираност на работното место. Се препорачува рано откривање и соодветни интервенции, вклучително и активности насочени кон ризик-факторите за депресија во работната средина.

Keywords: депресија; Patient Health Questionnaire, работници

Effects of Fatigue on Safe Driving Performance in Professional Drivers

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Numerous studies indicate that fatigue among professional drivers represents a significant risk factor that endangers the safe operation of motor vehicles.

Objective: To identify chronic fatigue (subjective feeling of fatigue, concentration, motivation, and physical activity/productivity) among professional drivers and to determine its predictive role in the occurrence of “aggressive/ordinary violations” and “errors/lapses” in traffic. **Materials and Methods:** The study is a descriptive-analytical cross-sectional study conducted among 210 professional drivers at the Institute of Occupational Medicine of the Republic of North Macedonia during the period 2020–2021. Chronic fatigue was assessed using the “Checklist Individual Strength,” which includes the dimensions: subjective feeling of fatigue, concentration, motivation, and physical activity/productivity. Drivers’ behavior in traffic was assessed using the “Driver Behavior Questionnaire,” which covers the categories “aggressive/ordinary violations” and “errors/lapses.”

Results: The examined professional drivers showed significantly greater problems with concentration (overall mean score 2.10 ± 0.82) compared with the subjective feeling of fatigue (overall mean score 1.64 ± 0.82). Chronic fatigue accounted for 6% of ordinary violations, while reduced physical activity/productivity among professional drivers was most strongly associated with the occurrence of ordinary violations, accounting for 18.9%. Traffic violations in 3.7% were the result of reduced concentration. Multiple regression analysis confirmed subjective fatigue and reduced concentration as independent significant predictors of traffic lapses, explaining 5.7% of the variance ($R^2 = 0.057$). The analysis of overall mean scores showed that professional drivers made errors least frequently, while aggressive violations were most common.

Conclusion: The results indicate that fatigue impairs key functions necessary for the safe operation of motor vehicles. Preventive measures are recommended to raise awareness of fatigue among professional drivers, improve work-time organization, limit shift length, and ensure adequate rest periods, particularly for drivers operating on long-distance routes.

Keywords: professional drivers, fatigue, traffic safety

Effectiveness of a Multidisciplinary, Evidence-Based Workplace Diabetes Management Program in a Large Steel Manufacturing Workforce: Outcomes from an ICMR-Collaborative Intervention Study

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Type 2 diabetes and hypertension represent significant occupational health challenges in industrial workforces, with prevalence rates approaching 34% in Asian steel manufacturing sectors. Early identification and comprehensive multidisciplinary management at the workplace can substantially reduce disease progression, improve quality of life, and reduce work-related absenteeism. This study evaluates an evidence-based, comprehensive occupational health intervention program developed in collaboration with Indian Council of Medical Research (ICMR).

Method: A prospective cohort analysis of 2,081 employees with diabetes/prediabetes identified through occupational screening at a Steel plant, (6,177 total screened). Of these, 847 enrolled in a comprehensive 12-month multidisciplinary intervention program designed in collaboration with ICMR scientists. Participants received: (1) Individualized endocrinologist consultation and quarterly reviews; (2) Personalized diet charts prepared by clinical dietitians with one-on-one counselling; (3) Individual physical activity targets and supervision by certified physical trainers; (4) Structured 3-monthly comprehensive follow-up assessments. Primary outcomes: HbA1c improvement, achievement of glycemic targets. Secondary outcomes: Body weight, waist circumference, blood pressure, lipid profile, workplace absenteeism, employee retention rates, and self-reported workplace confidence.

Results: Among 847 participants (mean age 46; 93% male), HbA1c fell from 8.12% to 7.45% (-0.67% , $p<0.001$); 23% achieved $\leq 7\%$. Mean weight reduced 3.2 kg, waist 4.5 cm, triglycerides 28 mg/dl, BP control improved 34%. Absenteeism dropped 31%, Employee retention rose 78%→89%.

Conclusion: Systematic occupational health screening with multidisciplinary, evidence-based workplace interventions yields significant metabolic improvement, reduces absenteeism, improves retention, and is cost-effective. ICMR collaboration ensures scientific rigor. Occupational health centres can function as effective NCD prevention and management hubs, integrating endocrinology, nutrition, and exercise science to enhance employee health, productivity, and workforce health security in developing nations.

Keywords: Type 2 diabetes Prediabetes Workplace intervention Multidisciplinary program Occupational health Steel manufacturing HbA1c reduction Absenteeism Employee retention ICMR collaboration

Establishing a Differentiated Strategic Framework for Workplace Physical Activity in North Macedonia: Addressing the Health Paradox through Evidence-Based Policy

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The global workforce is navigating an inactivity crisis, with 31% of adults failing to meet health recommendations. This trend is exacerbated by digitalization, leading to sedentary behavior and rising non-communicable diseases. In North Macedonia (RNM), regular activity among workers is estimated at only 25–40%. A critical factor is the "physical activity health paradox," which distinguishes between the cardioprotective benefits of leisure activity and the cardiovascular risks associated with strenuous occupational physical activity (OPA). Objectives: This study synthesizes international frameworks and national health data to propose a nuanced implementation model for RNM. The primary goal is to develop role-specific interventions that promote activity in sedentary environments while prioritizing recovery and ergonomic protection for high-OPA cohorts. Methods: Utilizing a complex desk research methodology, the study integrated WHO and EU strategic documents (2018–2030) with the 2024 WHO/Lancet inactivity report and the 2026 WHO guidelines on wearable technologies. Analysis involved a comparative review of "Good Practice" models from five EU countries (Sweden, Germany, Italy, Bulgaria, and Croatia) and a gap analysis of national legislation aligned with the 2024 Health Map of North Macedonia. Results: Findings reveal RNM's current initiatives are fragmented and lack formal integration into Occupational Safety and Health (OSH) protocols. Analysis demonstrates that "one-size-fits-all" programs are counterproductive; administrative staff require interventions to mitigate sedentary behavior, whereas workers in physically demanding sectors benefit most from "recovery quality." Furthermore, 2026 digital health standards and wearables offer significant opportunities for real-time cardiovascular monitoring to ensure worker safety. Conclusions: This research provides a foundational roadmap for an integrated "Active Workplace" model in RNM. Success requires a multisectoral approach—positioning the Institute of Occupational Health as a central coordinator—to institutionalize activity within national OSH protocols. Aligning practices with the latest WHO roadmaps is essential for long-term worker health, productivity and organizational resilience.

Keywords: physical activity health paradox, sedentary behavior, occupational safety and health, evidence-based policy, workforce resilience

Workplace Risk Assessment for Pregnant Workers Exposed to Physical Exerction: Croatian Approach

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Exposure to heavy lifting, prolonged standing, or heavy physical workload during pregnancy can contribute to adverse pregnancy outcomes. Croatian legal framework prescribes permissible workload for women but does not restrict workload for pregnant workers as a particularly vulnerable group. The aim is to present part of the recently developed Croatian guidelines on workplace risk assessment for healthy pregnant workers regarding exposure to physical exertion, thereby bridging this regulatory gap. Material and methods: The criteria were based on occupational physicians' consensus, scientific literature, and the legal framework. The German Key Indicator Method for risk assessment for manual lifting, holding, and carrying of loads was combined with recent literature recommendations to determine an acceptable risk level. Information on prolonged standing and organisational measures were also taken into consideration. Results: The maximum acceptable risk level regarding manual lifting, holding and carrying of loads for healthy pregnant workers is risk level 1, with a single load weight of up to 9 kg, total daily weight of less than 100 kg, with the body in an upright position and standing less than 4 hours per day with breaks or changes in body position, and with a free working pace. In the absence of information necessary for an adequate risk assessment, the risk would be classified as unacceptable, and pregnant workers should be spared from such work. Conclusions: Instead of reacting only after a pregnancy is reported, workplaces should be pre-evaluated using this practical risk assessment tool, which provides clearly defined criteria for acceptable physical workload in healthy pregnant workers. Further efforts are needed to develop risk assessment criteria for other workplace hazards, to ensure a comprehensive framework for the protection and safety of pregnant workers.

Keywords: criteria; lifting; pregnancy; prolonged standing; workload

Burnout and Mental Health Disorders in the Workplace: What Matters for a Safe and Sustainable Return to Work?

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Burnout has emerged as a major occupational health concern in the context of increasing psychosocial demands in modern workplaces. Although the World Health Organization defines burnout as an occupational phenomenon in ICD-11, it is not classified as a medical condition. This conceptual ambiguity remains one of the main barriers to its effective recognition within occupational health practice, particularly in relation to diagnosis, compensation, and return-to-work (RTW) processes. This presentation aims to critically examine how burnout is defined and recognized within occupational health systems, with a particular focus on European approaches. While some countries have developed clinical constructs such as exhaustion disorder, others address burnout primarily through psychosocial risk frameworks. These differences reflect a lack of standardization and result in heterogeneous recognition pathways across Europe. From an occupational health perspective, the absence of clear diagnostic and recognition criteria directly affects RTW processes. Delayed identification, inconsistent work-related attribution, and limited integration into occupational disease systems may prolong work disability and hinder sustainable reintegration into the workforce. In addition, the presentation will introduce a developing country perspective, using Türkiye as an example, where burnout is not formally defined within occupational disease recognition systems and lacks standardized diagnostic and compensation criteria. This gap further complicates both clinical and occupational management of burnout cases. It will be argued that recognizing burnout as a work-related condition is a critical step for improving RTW outcomes. Greater alignment between clinical definitions, occupational health practices, and policy frameworks—both in Europe and in developing contexts—is essential to address current gaps and to support workers experiencing burnout.

Keywords: Burnout, occupational health, return to work, mental health at work, occupational disease recognition

Psychosocial factors at work and health complaints among pharmacists

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Pharmacist's work includes diverse tasks which might expose them at some psychosocial risk factors and contribute to health complaints. The aim of the study was to follow psychosocial factors at work and health complaints among hospital and community pharmacists. Material and methods: A cross-sectional anonymous survey among 184 community and hospital pharmacists was conducted. The questionnaire contained questions regarding working conditions, psychosocial factors and psychosomatic complaints. Psychosocial risk was monitored with the short Danish stress assessment questionnaire (COPSOQ). Psychosomatic complaints (14 health symptoms) and workability were monitored. Results: High share of both groups of pharmacists (45.5%), considered the working conditions as good. Work ability was high for both groups, higher for hospital pharmacists (8.6 ± 1.2). Community pharmacists had slightly higher scores for quantitative demands and work pace, but also for stress, emotional exhaustion and work family conflict. Hospital pharmacists had higher scores for justice in distributing work tasks and resolving conflicts, job satisfaction, self-rated health status, role clarity. The number of psychosomatic complaints was average, higher among pharmacists working in community pharmacies (8.65 ± 3.9). The highest share of complaints was of frequent fatigue (68.5%) and anxiety (67.9%), pains in muscles and bones (65.8%) and pains in the back (57.1%). Conclusions: In order to provide health and safety at work and limit high stress among pharmacists, workload should be carefully assessed and working in a shortage of time avoided.

Keywords: Pharmacists, community pharmacists, hospital pharmacists, psychosomatic complaints, psychosocial factors

ПРИМЕНА И УЛОГА НА АЛАТКИТЕ ЗА ПРОЦЕНКА НА ЕРГОНОМСКИ РИЗИК ВО МЕДИЦИНАТА НА ТРУДОТ

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Вовед: Неправилната положба на телото, повторувачките движења, подигањето на тежок товар, продолженото седење или стоење и долгото времетраење на работните задачи претставуваат важни ергономски ризик фактори кои придонесуваат за појава на МСН. Поради комплексноста на работните активности во здравствениот сектор, примената на стандардизирани алатки за проценка на ергономскиот ризик е од особено значење за навремена идентификација на ризичните работни позиции и планирање на превентивни мерки.

Цел на истражувањето е да се прикаже примената и значењето на алатките за проценка на ергономскиот ризик во медицината на трудот, со посебен акцент на инструментот WERA (Work Ergonomic Risk Assessment).

Материјал и методи: Истражувањето е студија на пресек и користен е WERA инструмент за проценка на ергономскиот ризик. Во истражувањето се вклучени 170 доктори, 160 медицински сестри, 40 медицински лаборанти и 40 административно-технички персонал.

Резултати: Резултатите покажуваат дека кај најголем дел од испитаниците е регистрирано средно ниво на ергономски ризик. Кај медицинските сестри среден ризик е утврден кај 57.5%, додека висок ризик кај 30%. Кај докторите најголем процент има високо ниво на ергономски ризик (34.1%), со висок ризик во регијата на вратот, рачниот зглоб и грбот. Кај медицинските лаборанти доминира средно ниво на ризик (45%), додека кај административно-техничкиот персонал најчесто е регистриран среден ризик (56.2%). Утврдена е значајна поврзаност помеѓу мускулоскелетната болка и ергономските ризик фактори, особено напрегањето и кревањето тежок товар.

Заклучок: Алатките за проценка на ергономскиот ризик имаат значајна улога во медицината на трудот за систематска идентификација и евалуација на ризиците на работното место. Примената на WERA инструментот овозможува сеопфатна проценка на положбата на телото и физичките ризик фактори и претставува корисна алатка за планирање на превентивни ергономски мерки со цел намалување на мускулоскелетните нарушувања кај здравствените работници.

Keywords: ергономски ризик, мускулоскелетни нарушувања, здравствени работници.

Biomechanical Constraints and Low Back Pain Among Tunisian Healthcare Staff

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Objectives: To assess the prevalence of low back pain (LBP) among paramedical healthcare staff (PHS) and associated biomechanical constraints.

Methods: A cross-sectional survey was conducted among a representative sample of PHS from two Tunisian hospitals, involving 28 departments categorized into four groups based on physical demand levels (Group 1: Low physical demand; Group 4: High physical demand). The Nordic Questionnaire was used to screen for LBP. A specialized encoding program was used for direct biomechanical constraints observation (adopted postures, physical efforts, patient handling tasks) during a representative work period, with observations encoded at 15-second discontinuous intervals. A global summative score ranging from 1 to 12 was assigned to each encoded observation. ANOVA tests were used for statistical comparisons between groups.

Results: Among the included PHS ($n = 301$), 70.3% reported LBP, with moderate to severe intensity in 72% of cases and at least weekly discomfort in 58.5%. The highest prevalence was observed in Group 4 (77.4%). A significantly higher physical workload score was noted among Group 4 PHS (7.76 versus 7.25 for Group 1; $p = 0.039$). Furthermore, these PHS spent a higher fraction of their working time (FWT) standing with the back bent forward (22.99% versus 15.3% for Group 1), with a significant increase in FWT dedicated to light and/or heavy pushing and pulling efforts ($p = 0.0036$ and $p < 0.001$, respectively). Moreover, manual handling was significantly more frequent among Group 4 PHS (higher FWT; $p = 0.001$), specifically involving more patients with limited autonomy ($p = 0.002$) and/or those weighing more than 65 kg ($p < 0.001$).

Conclusions: Low back pain is one of the most frequently reported reasons for withdrawal from the workforce among PHS. This necessitates the implementation of adequate ergonomic interventions, particularly in high-load departments.

Keywords: Low Back Pain, Health workers, Biomechanical Exposure, Patient Handling, Ergonomics observation

The Relationship Between Magnesium and Hypertension in the Working Population

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Noise in the working environment can negatively affect worker health and productivity. Exposure to noise may lead to both auditory and extra-auditory effects, such as hearing loss, stress, elevated blood pressure, and sleep disorders. In industrial workers, noise exposure was associated with increased blood pressure. Different working environments are characterized by distinct sources of noise. Principal sources of operating theatre noise were identified. For example, in major operations, overall sound levels did not exceed recommended levels, but intermittent loud sounds up to 108 dB originated from suction equipment, intercoms, and anaesthetic monitors. Magnesium plays an important role in blood pressure regulation. Magnesium acts as a natural calcium antagonist. It potentiates the production of local vasodilatory mediators, such as prostacyclin and nitric oxide, and modulates vascular responses to various vasoactive substances, such as endothelin-1, angiotensin II, and catecholamines. Meta-analysis showed that magnesium supplementation may lower blood pressure. Therefore, magnesium supplementation may help control blood pressure.

Keywords: magnesium, hypertension, working population

Tuberculosis as an occupational disease

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Tuberculosis (TB) is not only a public health concern, being the leading cause of death from a single infectious agent worldwide, but also an occupational health concern. TB is considered an occupational disease when it affects those whose work brings them into direct contact with TB patients or materials infected with the *Mycobacterium tuberculosis* (*MTb*) and no other nonoccupational means of infection has been demonstrated. Some workers are at risk for exposure to *MTb*, including healthcare workers (HCWs), homeless, correctional and detention facility workers, and workers interacting with people from high TB burden countries (i.e. migrants). Analysis of risk of TB infection in the workplace should include assessment of the risk of transmission and risk of infection. The increased risk of infection for HCWs is not always easy to detect. Cluster analysis, based on *MTb* DNA genotyping, complemented with contact assessment, allow the estimation of TB in HCWs at the workplace. Legal requirements for TB as an occupational disease vary from working in healthcare to ensuring HCW's contact with TB patients or infectious materials, or perform tasks with a high risk of exposure to *MTb*. The TB infection control program (IPC) encompasses administrative and environment measures, as well as respiratory protection. The High IPC standards in high-income countries influence the lower incidence rate of TB in HCWs. TB must be reported as an occupational disease to the appropriate entities providing health and economic cover, in accordance with country's established criteria for work-related TB. TB in HCWs is on the list of occupational diseases of the International Labour Organization, and can be accepted and compensated as an occupational disease in all countries of the European Union. Protocols for medical surveillance of workers exposed to *MTb* should be encouraged, implemented as soon as workers take up their jobs and regularly thereafter. Given that identification and treatment of patients are fundamental measures to break the epidemiological chain, it is necessary to raise awareness of the potential diagnosis of tuberculosis as an occupational emergency.

Keywords: Tuberculosis, Occupational disease

Take Care of Yourself, Take Care of Your Mental Health: The Challenges of Mental Health in Modern Companies

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Менталното здравје претставува интегрален дел од општата благосостојба на поединецот, но во последните децении се соочува со значајни предизвици произлезени од брзиот социјален и технолошки развој. Овој труд има за цел да покаже дека вложувањето во менталното здравје придонесува за намалување на стресот, зајакнување на моралот, подобрување на комуникацијата и развој на вештините за решавање проблеми преку тимски активности. Воедно, се истражуваат клучните детерминанти што влијаат врз менталната состојба на современиот човек, со посебен фокус на социјалната изолација, дигиталниот стрес и економската несигурност.

Преку различни техники и тимски активности се предлагаат заеднички појадоди за „пробивање на мразот“, едукативни работилници со професионалци, квизови за ментално здравје и волонтерски акции. Со употреба на квалитативна анализа на постојната литература и компаративен приказ на неодамнешни истражувања, трудот ги идентификува најчестите нарушувања, како што се анксиозноста, депресијата и синдромот на „прегорување“ (burnout), кои се во постојан пораст.

Иако технологијата овозможува поголема поврзаност, таа често резултира со површни социјални интеракции кои не го задоволуваат човековиот инстинкт за вистинска припадност.

Трудот го обработува и стресот како глобален проблем и ги претставува практичните чекори на компанијата за негово ублажување. Дел од предлозите за намалување на стресот се воведување на флексибилно работно време, со почеток од 7:00 до 9:00 часот, и хибриден модел на работа, кои овозможуваат подобар баланс помеѓу професионалниот и приватниот живот, како и заштита на животната средина.

Заклучните согледувања нагласуваат дека менталното здравје не смее да се третира само како индивидуален проблем, туку како колективна одговорност. Трудот апелира за дестигматизација на менталните болести и поголема инвестиција во јавните здравствени политики, со цел создавање на поотпорно и поздраво општество.

Keywords: Mentalno zdravje, stres, burnout

Electronic Recording of Occupational Health Examinations in “Moj Termin”: Concept, Challenges and Solutions

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The digitalization of occupational health services is an essential component of modern health systems, enabling improved data availability, continuity of care, and evidence-based policymaking. In Moj Termin, the national health information system of North Macedonia, a dedicated module for electronic recording of occupational health examinations has been developed and implemented.

This paper presents the concept, development process, and implementation of the occupational health module, designed to support physicians specialized in occupational medicine in recording standardized data on employees' health examinations. The module enables structured data entry, integration with existing patient records, and improved traceability of preventive health services.

Key challenges encountered during implementation included the alignment of regulatory requirements, standardization of examination protocols, user adoption among healthcare professionals, and integration within existing clinical workflows. Additionally, ensuring data quality and interoperability with other system components required careful planning and stakeholder coordination.

The implementation of this module represents an important initial step toward strengthening occupational health surveillance. The system is designed as a scalable and evolving solution, allowing for continuous upgrades, functional expansion, and further alignment with national health priorities and user needs. Furthermore, the availability of structured and centralized data creates opportunities for improved monitoring, reporting, and informed decision-making by health authorities, contributing to more effective policy development in occupational health.

Keywords: eHealth; Occupational Health; Electronic Health Records (EHR); Moj Termin; Health Information Systems

Preparing University Students for High-Stress Professions: A Longitudinal Study of Stress Management Education and Well-Being in a Public University

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Aim: University education represents a critical opportunity for the early prevention of work-related stress. This study aimed to examine key predictors of well-being among students in a stress-management course in a naturalistic setting. **Methods:** A longitudinal pre-post design was conducted with undergraduate students at a public university. Data were collected electronically at two time points: beginning (T1: N = 41) and end of the semester (T2: N = 42), with a matched sample of 29 students. Participants were predominantly female (75.9%) and enrolled in social work and public administration programs. The stress-management course integrated education on stress biology, work-related stress, burnout, mindfulness, cognitive-behavioral, and time management techniques. Measures included the WHO-5 Well-Being Index, Perceived Stress Scale (PSS-10), and Depression Anxiety and Stress Scale (DASS-21). Instruments were translated into Albanian and demonstrated good psychometric properties. **Results:** Well-being significantly decreased from T1 (M = 63.59, SD = 22.20) to T2 (M = 56.97, SD = 24.81), $t(28) = 2.08$, $p = .047$, $d = 0.39$, although it remained within the moderate range. DASS-21 scores increased significantly, $t(28) = -3.21$, $p = .003$, $d = -0.60$, while perceived stress remained high but stable ($p = .059$). Regression analyses showed that perceived stress was a consistent negative predictor of well-being (T1: $\beta = -.56$, $p = .008$; T2: $\beta = -.44$, $p = .010$). The primary positive predictor shifted from social coping at T1 ($\beta = .39$, $p = .004$) to stress management-strategies at T2 ($\beta = .34$, $p = .041$; $R^2 = .38$). **Conclusions:** Perceived stress, but not psychological distress, remained a stable negative predictor of well-being, while the primary positive predictor shifted from social coping to stress-management strategies, highlighting the importance of structured stress-management education. Integrating such approaches into university curricula can better prepare students for high-stress professions and promote workers' wellbeing.

Keywords: Stress management education; Student well-being; Perceived stress; Higher education; Longitudinal study; Work-related stress prevention.

Artificial Intelligence as a Catalyst for the Development of a New Era in Workplace Risk Assessment

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Artificial intelligence (AI) has become a key tool in various sectors and industries, especially in workplace risk management. With the rise of technological development, AI is emerging as an essential tool for transforming safety protocols from reactive to preventive and predictive systems. AI plays an important role in identifying, evaluating and controlling workplace risks, with a particular focus on automating surveillance and analyzing large datasets. The application of AI in risk assessment involves the automated analysis of data from various sources, such as incident reports, safety surveys, and data on workplace conditions. These tools can identify trends and patterns that may indicate increased risks, further enabling proactive risk management, and providing for the adaptation of procedures and the development of training for employees. Unlike traditional risk assessment methods, which are often time-consuming and prone to human error, AI offers solutions that are faster, more efficient, and more reliable. Research shows that the implementation of three key systems (computer vision for monitoring personal protective equipment, predictive analytics for fatigue detection, and ergonomic AI sensors for the prevention of musculoskeletal disorders) can reduce the rate of workplace injuries by over 30% by detecting dangerous situations in real time. Machine learning algorithms successfully identify “hot spots” of risk, allowing for timely allocation of resources and training where they are most needed. AI does not replace the human factor, but rather increases its efficiency by eliminating subjectivity in risk assessment. However, it is necessary to overcome ethical challenges related to data privacy and establish a clear legal framework. The future of workplace risk management lies in the integration of AI, which will make workplaces safer and more productive. All this requires the need for a more intensive integration of AI into risk management strategies, in order to protect the health and safety of employees.

Keywords: Artificial intelligence, risk assessment, workplace, OSH, predictive analytics, computer vision.

Climate-sensitive Mortality in the Working-age Population in the Republic of N. Macedonia

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Background: Environmental exposures, particularly meteorological conditions and air pollution, are recognized as key determinants of mortality, yet evidence focusing specifically on the working-age population (15–64 years) is still scarce. Outdoor workers are among the most immediately affected by climate change. Key environmental risk factors affecting workers' health include heat stress, air pollution, aeroallergens, ultraviolet radiation, extreme weather events, and climate-sensitive vector-borne diseases projected to increase in frequency and intensity. **Aim:** To evaluate the short-term associations of meteorological variables and PM_{2.5} with all-cause, and specific mortality in the working-age population in the RN Macedonia. **Material and methods:** A time-series ecological study was conducted using monthly mortality data and meteorological parameters over a multi-year period (2017-2024). Descriptive statistics, Spearman correlation coefficients were applied to assess bivariate associations. Multivariable linear regression models estimated independent effects of temperature, wind speed, global radiation, and PM_{2.5}. Model fit and multicollinearity were assessed using R^2 and variance inflation factors. **Results:** Temperature was strongly inversely associated with all-cause ($\rho = -0.715$, $p < 0.001$) and respiratory mortality ($\rho = -0.616$, $p < 0.001$). PM_{2.5} was positively correlated with all-cause ($\rho = 0.376$, $p < 0.001$), circulatory ($\rho = 0.475$, $p < 0.001$), and respiratory mortality ($\rho = 0.482$, $p < 0.001$). In adjusted models, temperature ($\beta = -0.408$, $p = 0.005$) and wind speed ($\beta = -0.307$, $p = 0.007$) were significant predictors of all-cause mortality ($R^2 = 0.385$), while PM_{2.5} was independently associated with circulatory mortality ($p = 0.002$). **Conclusions:** Meteorological factors, particularly temperature, are drivers of mortality variability in the working-age population. PM_{2.5} shows a more specific association with circulatory mortality, highlighting the urgent need for climate-adaptive occupational health policies. Integrating meteorological early warning systems into workplace risk assessments and implementing targeted preventive measures could substantially reduce heat-related occupational morbidity and mortality.

Keywords: climate change, occupational health, heat stress, mortality, environmental epidemiology, working-age population.

Occupational Dermatoses in Healthcare Workers

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Background: Occupational dermatoses represent one of the most frequent categories of work-related disease among healthcare workers, largely driven by repeated exposure to irritants, allergens, and prolonged use of personal protective equipment (PPE). The COVID-19 pandemic has further increased incidence due to intensified hand hygiene practices and extended glove and mask use.

Objective: To synthesize current evidence on the epidemiology, risk factors, clinical manifestations, and preventive strategies related to occupational skin diseases in healthcare professionals.

Methods: A narrative review of peer-reviewed literature was conducted, focusing on observational studies, cohort analyses, and systematic reviews addressing occupational contact dermatitis, irritant contact dermatitis (ICD), allergic contact dermatitis (ACD), and related dermatoses in healthcare settings. Key databases included PubMed, Scopus, and Web of Science. Studies were evaluated for methodological quality and relevance to clinical and occupational health practice.

Results: Occupational dermatoses in healthcare workers are predominantly irritant contact dermatitis, accounting for the majority of cases, followed by allergic contact dermatitis. High-risk exposures include frequent handwashing, alcohol-based disinfectants, latex and synthetic gloves, and occlusive PPE use. Common clinical manifestations include xerosis, erythema, fissuring, pruritus, and chronic hand eczema. Identified risk factors include atopic predisposition, pre-existing skin barrier dysfunction, female sex, and prolonged occupational exposure without adequate skin protection measures. Preventive strategies with the strongest evidence include structured skin care programs, substitution of irritant products, use of fragrance-free emollients, and implementation of barrier protection protocols. Latex allergy has significantly decreased in settings that transitioned to non-latex gloves.

Conclusion: Occupational dermatoses remain a significant occupational health burden among healthcare workers, with substantial impact on quality of life, productivity, and healthcare system costs. Evidence supports multifactorial prevention strategies emphasizing skin barrier protection, workplace policy interventions, and early dermatological evaluation. Further high-quality longitudinal studies are needed to evaluate long-term effectiveness of preventive programs and to optimize occupational health guidelines.

Keywords: occupational dermatoses, healthcare workers

Evidence Based Policy Intervention in Injury Control and Trauma Care

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Introduction: Trauma accounts for more deaths annually than HIV/AIDS, malaria, and tuberculosis combined, underscoring the urgent need for effective injury control strategies within trauma care systems. This paper aims to present the experience of developing an evidence-based policy intervention. **Materials and Methods:** A public health approach was employed, integrating principles of evidence-based medicine and evidence-informed policymaking. The methodology included case analysis and a desk review of relevant literature published in leading journals: The Lancet, BMC Emergency Medicine, and Frontiers in Medicine. **Results:** Evidence: The CRASH-2 randomized, placebo-controlled trial (Lancet 2010), conducted across 274 hospitals in 40 countries and involving 20,211 trauma patients with or at risk of significant bleeding, evaluated the effects of tranexamic acid (TXA). 10,096 patients received TXA and 10,115 received placebo. The study demonstrated that TXA safely reduces mortality in patients with life-threatening traumatic hemorrhage by approximately one-third. It has been estimated that early administration of TXA (within three hours of injury) could prevent at least 100,000 trauma-related deaths globally each year. More recent studies (2024–2025) further confirm the efficacy, safety, and cost-effectiveness of TXA, particularly in prehospital settings. **Process:** Evidence-based policy recommendations were submitted to the Ministry of Health, including the registration of TXA in North Macedonia, its inclusion in the essential medicines list, the Health Insurance Fund positive list, and national emergency trauma care protocols. TXA was registered under the trade name Azeptil on 19 May 2020 as an injectable solution (500 mg/5 mL), with a retail price of 1,701 denars. Although not included on the hospital positive list, it has been incorporated into emergency treatment protocols. **Conclusion:** Tranexamic acid is an integral component of contemporary trauma care protocols for managing severe injury and major hemorrhage. Its early administration is strongly recommended in patients with significant blood loss, particularly in emergency and acute surgical settings

Keywords: Key words: injury, trauma, tranexamic acid, protocol, evidence based policy intervention

Lung cancer and Silicosis: Experiences of the German Porcelain Workers Cohort Study

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Porcelain workers enrolled in a mandatory medical surveillance program including triennial chest x-rays between 1985-1987 and alive at the end of the original study (2005) were followed through 2020 for all-cause mortality and silicosis incidence. Cause of death was determined from death certificates. New silicosis cases were identified by re-reading x-rays of individuals remaining in the medical surveillance program and those filing insurance claims for silicosis. Cause-specific standardized mortality ratios (SMRs) and 95% confidence intervals (CIs) were estimated by RCS exposure group based on work histories and about 8,000 industrial hygiene measurements. Cox proportional hazards models estimated risks by cumulative and average exposure groups.

No statistically significantly increased SMRs were seen due to lung cancer, renal cancer, or non-malignant renal disease. Lung cancer mortality was unrelated to RCS exposure. In contrast, silicosis risk (ILO score $\geq 1/1$) was strongly and statistically significantly associated with average RCS exposure intensity > 0.10 mg/m³ and cumulative exposure > 4.0 mg/m³-years. Using silicosis cases defined as ILO score $\geq 1/0$, Threshold Cox models estimated exposure thresholds of 4.04 mg/m³-years cumulative RCS exposure. Thresholds for annual average intensity estimates for each worker for the first two and five years of employment (the years associated with the highest exposures) were 0.264 mg/m³ (95% CI: 0.2-0.32) and 0.324 mg/m³ (95% CI: 0.263-0.38), respectively.

Despite the large number (n=284) of lung cancer deaths and high RCS exposure levels, no excess lung cancer and no relationship with exposure was seen. However, RCS exposures > 4 mg/m³-years (cumulative) or > 0.10 mg/m³ (average) clearly and statistically significantly were associated with silicosis risk. This study confirms that lung cancer and silicosis risk are not increased at RCS exposures at or below the current occupational exposure limit in Europe of 0.1 mg/m.

Keywords: Silica, Silicosis, Lung cancer, Risk assessment

Psychosocial Risk Prevention – Myth or Reality? A Qualitative Analysis of Expert Perspectives in Croatia

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Background: Psychosocial risks (PSRs) at work represent a growing occupational health challenge. In Croatia, the Occupational Safety Act (2014) introduced a legal obligation for employers to prevent work-related stress, yet a substantial gap persists between legislative requirements and their implementation in practice.

Objective: To examine (1) whether PSRs are adequately addressed in workplace risk assessments in Croatia, and (2) the current state and effectiveness of PSR prevention methods.

Methods: Five semi-structured expert interviews were conducted in September 2024 via Zoom. Participants included occupational medicine specialists (Croatian Institute of Public Health), OSH experts, a member of the National Council for Occupational Safety, and a representative of the Croatian Employers' Association. A standardised protocol addressed legislation, prevention practices, and systemic barriers.

Results: PSRs are nominally incorporated into Croatian legislation as "psychophysiological strains," but all interviewees agreed that risk assessments are routinely conducted as administrative formalities rather than genuine assessment. Over 90% of Croatian employers are small enterprises in which assessments are typically outsourced and lack worker involvement. No enforcement mechanism exists for PSR-specific measures, and Croatia faces a critical shortage of occupational safety inspectors (63% of the planned number). Regarding prevention, education and awareness campaigns – led primarily by the Croatian Institute of Public Health – represent the dominant, and often only, intervention. Isolated company-level examples (Croatian Post, Pliva, Heineken Croatia) demonstrate that comprehensive prevention is achievable when supported by management commitment and validated assessment tools. Mental health conditions, often a consequence of PSRs, remain absent from the national List of Occupational Diseases, and PSR-related sick leave is not systematically monitored.

Conclusion: PSR prevention in Croatia remains largely aspirational. Bridging the gap between legislation and practice requires enforcement mechanisms, financial incentives for employers, integration of PSR indicators into national health data systems, and mandatory inclusion of occupational medicine specialists in risk assessments.

Keywords: psychosocial risks; occupational safety; workplace stress prevention; risk assessment; Croatia

Understanding Work Ability in Automotive R&D Employees in India: A Cross-Sectional Descriptive Study

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Aim: This study aimed to describe self-reported work ability among employees in an automotive research and development (R&D) centre in India, using a questionnaire structured around internationally recognised work ability domains adapted for this workforce. It also sought to identify lifestyle, health and work-related factors associated with variations in perceived work ability.

Materials and Methods: A cross-sectional survey of 325 employees in engineering, design, software and IT, technical support and mixed desk and laboratory roles captured key work ability domains: current work ability (0–10 scale), ability to meet job demands, long term conditions and weekly symptoms such as musculoskeletal discomfort, eye strain, fatigue, stress and sleep disturbance. Record of absenteeism last year, future work ability outlook and mental resource indicators (enjoyment, alertness, optimism), screen exposure, exercise habits and sleep quality were also recorded. Data were summarised descriptively

Results: The mean work ability score was 7.7/10 (median 8). Engineering and design employees were 67%. Over half (55%) reported no long-term health conditions; musculoskeletal complaints prevailed among those affected. High screen exposure (≥ 6 hours/day) was common. Exercise was low and sleep quality varied. Weekly symptoms such as eye strain, neck or shoulder discomfort, fatigue and stress were frequent. Mental resources were mostly positive, though some reported reduced enjoyment and alertness. Absenteeism was low; most took fewer than ten health related days off. Most believed they could continue their current job for another two years.

Conclusions: Work ability in this automotive R&D workforce was moderate to high, but high screen exposure, sedentary patterns and musculoskeletal symptoms highlight need for early occupational health action. These findings support using adapted work ability frameworks to guide targeted health promotion in R&D environments.

Keywords: Work ability; Occupational health; Automotive industry; Research and development workforce; Musculoskeletal symptoms; Employee well-being

Towards a Safe and Healthy Working Environment in North Macedonia

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Towards a Safe and Healthy Working Environment in North Macedonia is an EU-funded project implemented by the International Labour Organization to support the realization of the fundamental right to a safe and healthy working environment for all workers in Macedonia. The project runs from 1 May 2025 to 30 October 2028 and focuses on strengthening the national occupational safety and health system through legal, institutional and capacity-building reforms.

The project activities include supporting the alignment of national OSH legislation with EU acquis and international labour standards; developing a gender-sensitive National OSH Policy and the National OSH Strategy 2026–2030; strengthening the role and capacity of the National OSH Council; improving the State Labour Inspectorate through new inspection methods, risk-based planning, training and a modern case management system; and establishing a reliable information system for reporting and analysing occupational accidents, injuries and diseases.

The project also works with government institutions, employers' and workers' organizations, OSH professionals and other national stakeholders to improve knowledge, awareness and practical capacities for preventing occupational risks. Through training, technical assistance, policy dialogue, campaigns and institutional support, the action aims to build a sustainable prevention culture and contribute to safer, healthier and more productive workplaces across Macedonia.

Keywords: OSH Strategy, Working Environment, legislation

Ambrosia sp. и Ailanthus altissima НОВА закана за работниците кои работат на отворено

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Цел: *Ambrosia sp.* (АМА) е инвазивен плевел, кој заедно со најинвазивното дрво *Ailanthus altissima* (Mill.) Swingle (АиА) глобално се шират во светот, но и кај нас на локализираните површини. Тие претставуваат значајна закана за животната средина од еколошки, агрономски, економски и здравствен аспект. Целта беше да се утврди дистрибуцијата на овие два вида во г. Скопје, како и нивните поленови концентрации. Исто така, да се презентираат и потенцијалните ризици по здравјето на работниците кои работат на отворено (РРО).

Материјал и методи: При следење на воздушните концентрации на поленот беше користен волуметриски метод (VPPS 2000), во 2013 и 2024 год., и беа користени рецентни научни истражувања и искуства.

Резултати: Плевелот АМА е застапен во селата во источниот дел од градот. АиА најчесто е регистрирано во дворови, покрај училишта, новоградби, патишта, тротоари итн. И двата вида се регистрирани покрај брегот на р. Вардар, кое е најчесто место за рекреација. Во 2024 констатирано се поголеми количества полен од АМА (вкупно 721) во споредба со 2013 (316) и од АиА (вкупно 463) во споредба со 2013 (47). АМА поленизира од јуни до септември, а АиА од крајот на мај до средината на јуни. РРО се изложени на поголеми концентрации од алергени, а поленот од АиА дополнително ја влошува состојбата кај пациентите со атопија, поради вкрстената реакција се препорачува тој да биде вклучен во палетата за тестирање. Нивната елиминација претставуваа и здравствена закана за професионалците кои ги отстрануваат, транспортираат и обработуваат. АиА излучува алантоиди кои предизвикуваат карактеристични контактни дерматити, а квазиноидот - професионален миокардит.

Заклучоци: Во контекст на климатските промени и нивното колонизациско ширење, тие претставуваат закана за биодиверзитетот, стопанството и здравјето на луѓето, а разорната моќ на АиА и закана за инфраструктурата во градот. Поради алергогениот и токсичен потенцијал потребни се детални професионални анамнези кај работниците и стратегии за искоренување на овие два вида.

Клучни зборови: *Ambrosia sp.*, *Ailanthus altissima* (Mill.) Swingle, работници кои работат на отворено.

Проценка на Професионалниот Ризик за Појава на Хронични Респираторни Симптоми кај Професионални Возачи

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Цел: Да се процени ефектот од професионалната експозиција и нејзиното времетраење врз хроничните респираторни симптоми и белодробната вентилација кај професионалните возачи во Република Северна Македонија.

Материјал и методи: Изведена е епидемиолошка студија на пресек во Одделот за медицина на трудот при ЈЗУ Здравствен дом “д-р Панче Караџов” Штип со вклучени 40 испитаници кои работат како професионални возачи кои поседуваат возачката дозвола за управување со моторно возило од Ц и Ц+Е категорија со примена на стандардизиран прашалник за ХОББ, спирометрија и матрици за професионалната изложеност на респираторни штетности, како и 40 испитаници кои се вработени како административен и образовен кадар во образовно-научни институции како контролна група.

Резултати: Зачестеноста на хроничните респираторни симптоми во последните 12 месеци е повисока кај професионалните возачи во споредба со испитаниците од контролната група, со утврдена сигнификантна разлика за појава на кашлица (57,5% vs. 27,5%; $p=0,013$), како и гушење (15,5% vs. 2,5%; $p=0,042$), соодветно. Просечните вредности на FVC, FEV1, MEF75 и MEF25-75 кај професионалните возачи се пониски во споредба со просечните вредности на овие параметри кај контролната група, но без статистичка сигнификантност. Просечните вредности на спирометриските параметри кај професионалните возачи со работен стаж на актуелното работно место поголем од 10 години се пониски во споредба со истите кај возачите со работен стаж помал од 10 години, со регистрирана статистички сигнификантна разлика за MEF50 ($p=0,046$) и MEF25-75 ($p=0,041$), соодветно.

Заклучок: Нашите податоци укажуваат дека изложеноста на работното место кај професионалните возачи може да доведе до хронични респираторни нарушувања, што е тесно поврзано со должината на работниот стаж на актуелното работно место.

Клучни зборови: хронична опструктивна белодробна болест, аерополутанти, професионални возачи, спирометрија.

Enhancing Occupational Health Curriculum in Higher Education: Innovations, Outcomes, and Future Directions — The Harbel College Experience

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Aim: This study investigates the design, implementation, and impact of pioneering occupational health, environmental science, climate change, and disaster management programs at Harbel College, Liberia. It specifically explores how these curricula innovations have advanced gender equity, student achievement, and national educational reform.

Material and Methods: A qualitative case study approach was adopted. Data sources included institutional records (enrollment, graduation, and employment data from 2015 to 2025), semi-structured interviews with faculty, students, alumni, and community leaders, and alumni tracking. Thematic analysis was performed on student and graduate survey/interview responses. Particular emphasis was placed on the Hippo FC Soccer Academy, a unique outreach initiative that used sports advocacy and scholarships to engage and empower female students and promote STEM education.

Results: Between 2022 and 2025, Harbel College enrollment rose from 300 to 1,200 students, with female participation increasing from under 10% to over 55%. All 11 members of the inaugural occupational health cohort graduated and secured full-time employment; two alumni established Liberia's first occupational safety and climate consultancies. Over 30% of female students in STEM and OHS programs were recruited via Hippo FC, which also produced Margibi University's first female valedictorian, who addressed the President of Liberia. Thematic findings indicate that contextually relevant curricula, targeted community outreach, sports-based support systems, and persistent mentorship were decisive in overcoming cultural barriers and advancing gender equity. Graduates reported enhanced confidence, professional advancement, and positive community influence.

Conclusions: The Harbel College experience demonstrates that context-driven curriculum innovation, combined with gender-focused outreach and sports engagement, can drive educational reform, workforce advancement, and gender equity. The model is now being replicated at over 20 Liberian institutions and offers a scalable solution aligned with the ILO's decent work and gender equality objectives.

Keywords: Occupational Health Curriculum, Innovation, Gender Equity, STEM Education, Environmental Science, Climate Change, Sports-Based Outreach

Health Risks Related to Long-term Occupational Exposure to Silica Dust

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Silicon dioxide, also known as silica, is one of the most abundant minerals in the Earth's crust, occurring in both crystalline and amorphous forms. The most common form of crystalline silicon dioxide is quartz; while the most common materials in the industry which contain quartz are sand, gravel, and rock. The most important occupations characterized by exposure to dust containing free silicon dioxide are: metal and coal mines with underground and above-ground exploitation; construction workers (builders, facade installers and terrace specialists, etc.) in addition to the production of building materials, road and tunnel construction, granite processing, production and processing of slate, production of cement and glass, production of ceramics and porcelain, etc.

Considered a health risk is the inhalation of crystalline silicon dioxide. Long-term occupational exposure to dust containing free silicon dioxide may cause irritant, toxic and/or carcinogenic effects to the lungs in exposed workers. The most important occupational diseases caused by inhalation of free silicon dioxide are silicosis, chronic obstructive pulmonary disease (COPD) and lung cancer, as well as a combination of these diseases.

Primary tool in reducing the morbidity, mortality and disability caused by diseases associated with exposure to free silicon dioxide is the prevention based on appropriate engineering controls, protective respiratory equipment, regular periodic medical examinations and legal regulation on the level of occupational exposure to free silicon dioxide.

Keywords: silicosis, chronic obstructive pulmonary disease, crystalline silica, lung cancer, preventive measures

Occupational Challenges and Physical Symptoms Experienced by Bus Drivers in Metro Manila

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Objective: Metro Manila is one of the cities globally with high traffic density. This study looked at how compensation and work schedules of bus drivers affect their medical conditions, physiological health symptoms, and ultimately road crashes in Metro Manila.

Methods: The study utilized a survey method that employed a multi-level cluster sampling method of bus drivers in Metro Manila. A total of 340 samples were taken in bus terminals around the metropolitan area in 2021.

Results: The results showed that caffeine intake among bus drivers significantly increased the odds of reported fatty food intake (OR = 1.15, $p = .020$) and high-sugar food items (OR = 1.120, $p = .047$).

Multiple linear regression (MLR) was conducted on the predicted outcome of crash risk with predictor outcomes: daily driving hours, medical conditions core, daily rest hours, years of tenure at company, and 5) fatigue levels. The overall model was statistically significant, $F(5, 323) = 21.1$, $p < .001$, explaining approximately 24.6% of the variance in crash outcomes ($r^2 = .246$). The findings suggest that bus drivers with longer driving hours, longer tenure, less rest periods, higher scores on medical condition, and higher fatigue levels experience significantly more crashes. Two of the most significant predictors of crash outcomes are fatigue and rest periods.

Conclusion: The findings suggest that higher caffeine intake among bus drivers may be associated with an increased risk of diabetes, blood sugar dysregulation, and cardiovascular diseases, as greater caffeine consumption was linked to 15% higher likelihood of fatty food intake and 12% higher likelihood of consuming high-sugar food items. On the other hand, the MLR model highlight key occupational risk factors that contribute to negative crash outcomes. The findings suggest policies that target fatigue levels, and impose mandated rest periods to reduce crash likelihood and improve driver occupational health.

Keywords: occupational health, road safety, professional drivers, physical health symptoms, medical conditions, fatigue

FLASH TALKS



Psychosocial Barriers to Physical Activity Among R&D Employees in South India: A Cross-Sectional Study

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Aim: To identify and prioritise psychosocially relevant barriers to physical activity among factory employees using a predefined action threshold (domain score >5) to inform workplace health planning.

Materials and Methods: A cross-sectional survey was conducted among 167 factory employees. Barriers to physical activity were assessed using the validated 21-item Barriers to Being Active questionnaire, comprising seven domains: lack of time, social influence, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. Each domain included three Likert-scaled items, summed to yield domain scores ranging from 0 to 9. In accordance with the instrument guidance, domain scores >5 were defined a priori as priority barriers warranting focused intervention. Descriptive statistics (mean $\pm$ SD) and the proportion of participants exceeding the threshold were calculated for each domain.

Results: Using the predefined threshold, 93.4% of employees reported at least one priority barrier, 87.4% reported two or more, and 77.2% reported three or more barriers. The mean number of actionable barriers was 3.6 ± 1.8 (median = 4). The most prevalent barriers were lack of energy (82.0%; 6.52 ± 2.25), lack of willpower (81.4%; 6.26 ± 2.22), and lack of time (71.9%; 5.81 ± 2.36). Lack of resources (45.5%; 4.41 ± 2.43) and social influence (47.3%; 4.20 ± 2.07) were moderately prevalent, whereas lack of skill (26.9%; 2.98 ± 2.58) and fear of injury (9.6%; 1.57 ± 2.04) were infrequently reported.

Conclusion: Barriers to physical activity were predominantly psychosocial, especially fatigue/low energy, time constraints, and reduced motivation, rather than skill deficits or injury concerns. Occupational health interventions should therefore prioritise fatigue management, schedule review, protected activity breaks, supportive supervision, and structured behaviour-change strategies, with targeted resource improvements where needed.

Keywords: Physical activity, psychosocial barriers, R&D employees, occupational health, time constraints, workplace health promotion.

Physical Activity Impairment in Pneumoconiosis: The Additional Burden of Coexisting COPD

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Background: Pneumoconiosis is an irreversible lung disease resulting from mineral dust exposure and fibrotic lung reaction. Chronic obstructive pulmonary disease (COPD) can develop in individuals with pneumoconiosis, a situation arising from overlapping risk factors like exposure to occupational dust and smoke. The interaction of these two conditions may lead to worsened pulmonary impairment and decline in overall quality of life. This research sought to investigate the clinical characteristics and physical activity levels of pneumoconiosis patients, comparing those with and without COPD.

Methods: This cross-sectional study included a total of 261 patients: those diagnosed with pneumoconiosis (n:87), pneumoconiosis combined with COPD (n:87), and COPD (n:87) who were followed at a tertiary hospital. Demographic data, smoking history, duration of occupational exposure, and comorbidities were documented. Dyspnea severity was assessed using the mMRC scale. Pulmonary function tests were conducted. COPD diagnosis and severity were determined based on the GOLD criteria. Physical activity levels were evaluated using the International Physical Activity Questionnaire–Short Form.

Results: According to the physical activity levels of the participants, 40.6% were classified as inactive, 58.2% as minimally active and only 1.1% as sufficiently active. When the groups were compared in terms of physical activity levels, the highest rate of inactivity was observed in the P+C group ($p<0.001$). In the P+C group, the proportion of individuals with mMRC dyspnea scores of 3 and 4 was significantly higher compared with the COPD and pneumoconiosis groups ($p<0.001$). Additionally, MET-min/week values were lower, the number of individuals with MET <600 was significantly higher ($p<0.001$) in C +P group.

Conclusion: The presence of COPD in individuals with pneumoconiosis correlates with more severe clinical manifestations and considerably diminished physical activity. These observations underscore the necessity of early COPD identification in pneumoconiosis patients, alongside the application of focused pulmonary rehabilitation and physical activity programs within this vulnerable group.

Keywords: Pneumoconiosis, Physical activity, IPAQ-Short questionnaire, COPD

Healthcare Workers Tobacco Use: A Study among 852 Caregivers

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Aim: To assess tobacco use among healthcare workers (HCWs) and to identify associated factors.

Materials and Methods: An exhaustive cross-sectional study was conducted during seven months among HCWs in public hospitals of three health districts in central Tunisia. Data were collected via an anonymous self-administered questionnaire, including the Fagerström Nicotine Dependence Test. **Results:** The response rate was 83.8% (n=714). Active tobacco use was reported in 14.42% with 12.42% active smokers and 2% former ones. Passive smoking affected 20% of participants. Active smokers mean age was $39,6 \pm 11$ years, with initiation under age of 20 years in 30.7% of cases and mean smoking duration of $16,97 \pm 11,06$ years. Industrial cigarettes were used exclusively in 77.8% of cases and combined with e-cigarettes in 12.3%. Consumption was <10 cigarettes/day in 40% of cases and <20 pack-years in 69%. Smoking was significantly more prevalent among men ($P<10^{-3}$), medical staff ($p=0,004$), emergency department workers ($p<10^{-3}$) and night-shift workers (30,6 % vs 18,8%). Dependence levels were low (51.3%), moderate (32.5%), and high (16.3%). Early initiation and night work were associated with higher dependency ($p < 10^{-3}$). Both exposure to stress and other substance abuse, were identified as maintenance factor. substances (18,8 %vs 2,9 %; $P=0,039$). A higher risk of smoking-related somatic complaints was confirmed among smokers with moderate dependence level and those working night shifts (OR = 7.249 and OR = 33.618, respectively). Tobacco consumption within the hospital was totally absent for 12.3% of HCWs, reduced by 45% and increased by 26.5% of them. Maintaining or increasing smoking in hospital environment was correlated with age under 30 years (OR=4.301), medical staff (OR=3.637), emergency workers (OR=7.955), and night-shift staff (OR=21.393).

Conclusion: Targeted anti-smoking strategies for HCWs are crucial notably for young, night-shift and medical staff with rigorous policy enforcement

Keywords: Healthcare Workers; Tobacco Use; Dependency; Prevention; Smoking cessation

Implementation of Directive (EU) 2023/2668 Into the Croatian Legal Framework: Worker Protection and Recognition of Occupational Diseases caused by Asbestos Exposure

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The aim of this paper is to present the amendments to Croatian legislation related to the protection of workers from asbestos exposure in accordance with European regulations, the protocol for recognizing occupational diseases and the records of workers with asbestos-related occupational diseases. Although the use of asbestos is banned due to confirmed serious health risk to humans, yet it still represents a risk in certain work environments. Inhalation of asbestos fibres can lead to diseases such as asbestosis, pleural plaques, mesothelioma, lung cancer, laryngeal cancer and symptoms often appear decades after exposure. Understanding the magnitude, the European Union adopted a new DIRECTIVE (EU) 2023/2668 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 22 November 2023 amending Directive 2009/148/EC on the protection of workers from the risks related to exposure to asbestos at work. The purpose of the Directive is better protection of workers through lower permissible exposure limits and introducing stricter safety protocols during the remediation of buildings containing asbestos. In Croatia, diseases caused by asbestos exposure are recognized as occupational diseases. Cancer of the digestive system and ovarian cancer are to be added to the List of occupational diseases. The Croatian Institute of Public Health maintains Registry of workers affected by asbestos-related diseases. Between 2009 and 2025, 1,830 workers were registered. Workers with recognized occupational disease have the right to claim compensation either through the pension and health insurance system or through the courts. Amendments to the legislation in line with European regulations represent an important step in strengthening the preventive system for worker protection, as well as in ensuring legal certainty and adequate protection of the rights of people with occupational disease due to asbestos exposure.

Keywords: asbestos, occupational disease, directive, workers

Small Scale Gold Mining - Risk Assessment of Miners and the Environment

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This comprehensive research report covers an overview of the land use in T'boli including mining areas which are the target sites of the study. Methods included survey, industrial hygiene measurements, sampling of human blood monitoring of small-scale miners, and of various environmental media for mercury determination in soil, water, plants and fishes. Then results of the laboratory-analyzed chemical contaminations are visualized and presented using geographic information system (GIS) in order to locate the exact area in the mines and community of possible occupational and environmental contamination. These graphs and maps with specific coordinates are presented in this study.

Based on German Human Biomonitoring (HBM) values: HBM-I = 0.005 µg/mL; HBM-II = 0.015 µg/mL; 8.13% of the 209 blood samples of miners are in category HBM-II needing intervention. 43% are in between HBM -I and HBM-II which calls for confirmation for potential sources. PLANT QS based on Indonesian National Agency of Drug and Food Control Quality Standards (QS) = 0.5 mg/kg, 21.05% was used for plants, and of the 76 plant samples exceeded the standards. Based on the Philippine DENR (DAO-2016-08) General Effluent Standards 2016 Maximum Allowable Limit (MAL) = 0.004 mg/L for release to Class C water bodies, two percent of the 24 water samples exceeded the standards. Of the 30 samples of fish, only one exceeded the FISH MRL based on Philippine National Standards – Bureau of Agriculture and Fisheries Standards 2020 (Fish and fishery products – Tilapia) Maximum Residue Level (MRL) = 0.5 mg/kg. Above threshold limit values were also taken from air monitoring. The study has shown results that are not within standard values for air, water, plant, fish, and human blood samples, evidencing the risks to health among small scale miners.

Keywords: risk assessment, occupational health, environmental health, small scale mining, blood mercury

Women in The Interplay of Occupational Safety Culture and Marketing Communication: A Case Study from the Turkish Textile Industry

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Women are the group that most immediately springs to mind when discussing fashion. Furthermore, women make up a significant portion of the textile production sector, especially in Türkiye. Consequently, they work in the marketing sector, which encompasses both the production and consumer sides of the industry. The purpose of this study is to describe the cultural circumstances surrounding occupational health and safety for female workers in the textile sector, as well as the producer and consumer perspectives of those women. The study is a case study conducted in various regions of Turkey. This qualitative and quantitative study uses surveys and interviews. The questionnaires were distributed to female blue-collar workers, and both blue-collar and white-collar workers took part in the interviews. One of the contributions to the literature is the creation of the scale for the questionnaire. IBM SPSS Statistics 30.0 and IBM SPSS AMOS 24.0 were used for all qualitative data analysis. MaxQDA Analytics PRO 2024 software was used to analyze the qualitative data gathered from the interviews. The findings show that the experience of working positively impacts the culture of occupational health and safety. The accountable workers emphasized that they encounter difficulties persuading employers to act regarding occupational health and safety. Additionally, the female employees noted that they struggle to balance their personal and professional lives. Employees stressed the need to obtain occupational health and safety training, which might be considered marketing communication. The densest words, according to the word cloud analysis, are "general," "hard," "training," "work," "mask," "apron," and "occupational health and safety."

Keywords: occupational safety culture, female employees, marketing communication

Acupuncture for Pain Management in Evidence-based Medicine

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Pain is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. The previous experience of acupuncture research studies is invaluable for researchers to recognize the limitations and challenges of research designs and would help to move the field forward in future research. For example, the design of an adequate sham control, involvement of skilled and experienced acupuncturists, adequate outcome measures in the clinical trials, and the discovery of physiological effects of acupuncture in basic science are all important tasks for acupuncture researchers to address and solve. Acupuncture is a complex intervention and focuses on individualized treatment. Other challenges also exist in the clinical research of acupuncture. One challenge is the involvement of the acupuncturist. Challenges and future directions of acupuncture research for pain conditions in EBM High-quality RCTs and meta-analysis have increasingly produced robust evidence of the effectiveness of acupuncture for pain conditions, although nonspecific physiologic response to the needle insertion and the nature of holistic character of acupuncture treatment led to many challenges in the research designs that reflect the daily clinical acupuncture practice. Individual patient data meta-analysis and large RCTs of acupuncture for pain conditions. In recent years, studies have increasingly provided some evidence for using acupuncture for pain management. In 2012, an individual patient data meta-analysis was conducted by Andrew et al to evaluate the effectiveness of acupuncture for four types of chronic pain: back and neck pain, osteoarthritis, chronic headache, and shoulder pain. The result reflects that acupuncture was superior to sham acupuncture controls and to the usual care controls in all four chronic pain conditions.

Discussion. As the newest revolution in the field of medical science, EBM has converted the classic authoritarian expert-based medicine and become the fundamental basis for clinical practice.

Keywords: acupuncture; evidence-based medicine; pain management; research methodology

Psychosocial Hazards in the HSE Training Institutions

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Psychosocial hazards in an SHE (Safety, Health, and Environment) training institute refer to aspects of the learning and working environment that can negatively affect the mental health and wellbeing of trainees and staff. These hazards often arise from high academic workload, strict deadlines, pressure to pass professional certifications, and uncertainty about future employment. Additional factors such as poor communication from trainers, lack of feedback, cultural and language barriers among diverse trainees, and potential issues like bullying or discrimination can further increase stress levels. Prolonged exposure to these conditions may lead to anxiety, reduced concentration, low motivation, and burnout, ultimately affecting both learning outcomes and overall performance. To manage these psychosocial hazards, several psychological techniques can be applied. Cognitive Behavioral Therapy (CBT) techniques can help trainees identify and challenge negative thoughts related to failure or performance pressure. Stress management strategies, such as deep breathing exercises, progressive muscle relaxation, and mindfulness meditation, can reduce anxiety and improve focus. Time management and goal-setting techniques help in organizing study tasks and reducing overload. Additionally, peer support groups and open communication channels encourage sharing of concerns, while resilience training can strengthen coping skills and emotional stability. Implementing these techniques within the institute can significantly improve mental wellbeing and create a healthier learning environment.

Keywords: Workload pressure, anxiety, counseling support, Cognitive Behavioral Therapy (CBT)

Evaluation of Non-Adrenergic - Non-Cholinergic Mediators in Response to Thermal Balance in Lifestyle Clients at Risk of Heat Illness

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This study examined the role of non-adrenergic, non-cholinergic (NANC) mediators in regulating thermal balance and cardiovascular responses in individuals prone to heat-related illnesses due to lifestyle factors. Specifically, it investigated how prostaglandins and histamines influence core body temperature, skin temperature, sweat rate, heart rate, and blood pressure during exercise and heat exposure. Understanding these mechanisms is essential for identifying physiological vulnerabilities in at-risk populations.

A controlled experimental approach was used to systematically assess thermoregulatory and cardiovascular changes under three conditions: baseline control, prostaglandin blockade, and histamine blockade. Participants comprised lifestyle clients considered vulnerable to heat illness. Altering NANC pathways produced measurable shifts in thermoregulatory parameters, highlighting their role in maintaining temperature homeostasis. Disruptions to these pathways affected cardiovascular dynamics, suggesting that impaired NANC signaling may compromise heat tolerance.

The findings demonstrated that modulating prostaglandin and histamine activity resulted in significant variations in core and skin temperatures, sweat rate, heart rate, and blood pressure. These responses underscore the importance of NANC mediators in coordinating peripheral vasodilation, sweating efficiency, and cardiovascular adjustments during heat stress. The observed patterns have meaningful implications for identifying individuals at increased risk of heat strain and for developing targeted strategies to support thermal stability.

By clarifying the contribution of NANC mediators to heat regulation, this study enhances our understanding of physiological susceptibility in heat-exposed populations. The results support the implementation of personalized preventive interventions, including optimized hydration, tailored cooling strategies, and monitoring protocols for high-risk individuals. Further research into additional pathways influencing thermoregulation and cardiovascular responsiveness is warranted.

Integrating these insights into clinical and occupational health practice may strengthen preventive care and improve outcomes for lifestyle clients vulnerable to heat illness. Overall, this study provides important evidence on the interplay between NANC mediators and thermal balance, contributing to improved health and safety in heat-challenged environments.

Keywords: NANC, lifestyle clients, skin temperature, cardiovascular response.

Physical Activity Impairment in Pneumoconiosis: The Additional Burden of Coexisting COPD

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Background: Pneumoconiosis is an irreversible lung disease resulting from mineral dust exposure and fibrotic lung reaction. Chronic obstructive pulmonary disease (COPD) can develop in individuals with pneumoconiosis, a situation arising from overlapping risk factors like exposure to occupational dust and smoke. The interaction of these two conditions may lead to worsened pulmonary impairment and decline in overall quality of life. This research sought to investigate the clinical characteristics and physical activity levels of pneumoconiosis patients, comparing those with and without COPD.

Methods: This cross-sectional study included a total of 261 patients: those diagnosed with pneumoconiosis (n:87), pneumoconiosis combined with COPD (n:87), and COPD (n:87) who were followed at a tertiary hospital. Demographic data, smoking history, duration of occupational exposure, and comorbidities were documented. Dyspnea severity was assessed using the mMRC scale. Pulmonary function tests were conducted. COPD diagnosis and severity were determined based on the GOLD criteria. Physical activity levels were evaluated using the International Physical Activity Questionnaire–Short Form.

Results: According to the physical activity levels of the participants, 40.6% were classified as inactive, 58.2% as minimally active and only 1.1% as sufficiently active. When the groups were compared in terms of physical activity levels, the highest rate of inactivity was observed in the P+C group ($p < 0.001$). In the P+C group, the proportion of individuals with mMRC dyspnea scores of 3 and 4 was significantly higher compared with the COPD and pneumoconiosis groups ($p < 0.001$). Additionally, MET-min/week values were lower, the number of individuals with MET < 600 was significantly higher ($p < 0.001$) in C +P group.

Conclusion: The presence of COPD in individuals with pneumoconiosis correlates with more severe clinical manifestations and considerably diminished physical activity. These observations underscore the necessity of early COPD identification in pneumoconiosis patients, alongside the application of focused pulmonary rehabilitation and physical activity programs within this vulnerable group

Keywords: Pneumoconiosis, Physical activity, IPAQ-Short questionnaire, COPD

Impact of the unfavorable microclimate on the health of workers in the construction sector

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Introduction: Workers in the construction sector are exposed to numerous occupational hazards, including heavy physical workload, outdoor work, dust, chemical agents, noise, and vibrations. One of the most significant environmental risks is exposure to extreme temperatures, particularly heat stress. Construction workers often perform their tasks in conditions characterized by high ambient temperatures and humidity, which increases the risk of heat-related illnesses. These conditions may lead to several health problems, such as heat cramps, heat rash, heat exhaustion, and heat stroke. Among them, heat stroke represents the most severe condition, occurring when the body's thermoregulatory mechanisms fail to maintain a safe internal temperature. Continuous exposure to unfavorable microclimatic conditions may negatively affect workers' health and productivity. **Materials and Methods:** The study was conducted among 523 construction workers over a six-month period, from January to June 2024, in Macedonia. A sociological research method was applied using a structured questionnaire to assess occupational exposure and perceived health impact. The collected data were analyzed using descriptive statistics and the Chi-square test. All respondents included in the study were male. The mean age of the participants was 46.35 ± 8.66 years. **Results:** The results show that 87.2% of respondents reported frequent exposure to extreme temperatures (very hot or very cold), while 12.8% reported occasional exposure. Heavy physical exertion was reported by 97.9% of workers. Regarding working hours, 85.9% indicated that their working day lasts between 6 and 8 hours. When evaluating the impact of work on overall health, 83% of workers perceived the effect as moderate, while 17% reported a very negative impact. **Conclusion:** Construction workers are exposed to multiple occupational risk factors on a daily basis. Unfavorable microclimatic conditions are highly prevalent and negatively affect workers' health. Therefore, it is necessary to implement preventive measures and improve working conditions to reduce heat-related occupational health risks.

Keywords: construction workers, unfavorable microclimate, work related diseases, prevention

Small Scale Gold Mining - Risk Assessment of Miners and the Environment

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This comprehensive research report covers an overview of the land use in T'boli including mining areas which are the target sites of the study. Methods included survey, industrial hygiene measurements, sampling of human blood monitoring of small scale miners, and of various environmental media for mercury determination in soil, water, plants and fishes. Then results of the laboratory-analyzed chemical contaminations are visualized and presented using geographic information system (GIS) in order to locate the exact area in the mines and community of possible occupational and environmental contamination. These graphs and maps with specific coordinates are presented in this study.

Based on German Human Biomonitoring (HBM) values: HBM-I = 0.005 µg/mL; HBM-II = 0.015 µg/mL; 8.13% of the 209 blood samples of miners are in category HBM-II needing intervention. 43% are in between HBM -I and HBM-II which calls for confirmation for potential sources. PLANT QS based on Indonesian National Agency of Drug and Food Control Quality Standards (QS) = 0.5 mg/kg, 21.05% was used for plants, and of the 76 plant samples exceeded the standards. Based on the Philippine DENR (DAO-2016-08) General Effluent Standards 2016 Maximum Allowable Limit (MAL) = 0.004 mg/L for release to Class C water bodies, two percent of the 24 water samples exceeded the standards. Of the 30 samples of fish, only one exceeded the FISH MRL based on Philippine National Standards – Bureau of Agriculture and Fisheries Standards 2020 (Fish and fishery products – Tilapia) Maximum Residue Level (MRL) = 0.5 mg/kg. Above threshold limit values were also taken from air monitoring. The study has shown results that are not within standard values for air, water, plant, fish, and human blood samples, evidencing the risks to health among small scale miners.

Keywords: risk assessment, occupational health, environmental health, small scale mining, blood mercury

Recognition of chronic lead poisoning as an occupational Disease – a case report

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Lead is a heavy metal widely used in industry, recognized for its toxic effects and slow elimination from the human body. Occupational exposure most commonly occurs in environments where lead dust and fumes are generated, particularly in battery manufacturing plants, smelting facilities, and foundries. Prolonged exposure may result in chronic lead poisoning, which is characterized by non-specific clinical manifestations and multisystem damage. Chronic lead poisoning is included in the official list of occupational diseases. The aim of this paper is to present the clinical and toxicological aspects relevant to the recognition of chronic lead poisoning as an occupational disease.

A 39-year-old male mechanical technician, employed for five years as a furnace operator at a battery manufacturing plant, was referred to the Serbian Institute of Occupational Medicine due to lower limb pain, weakness, and paresthesia. Clinical examinations, biochemical analyses and a complete blood count were performed. All results were within reference ranges, except for elevated total and LDL cholesterol levels. However, toxicological assessment revealed significantly elevated concentrations of lead in both blood and urine, accompanied by disturbances in porphyrin metabolism, including increased erythrocyte protoporphyrin (ePPIX), coproporphyrin, and delta-aminolevulinic acid (δ -ALA). A five-day chelation therapy with CaNa_2EDTA was administered, resulting in urinary excretion of 46,700 μmol of lead. Based on the toxicological findings, a diagnosis of chronic lead poisoning was established and recognized as an occupational disease. One month later, the patient underwent a second course of chelation therapy, during which an additional 31,791 μmol of lead was excreted in urine, confirming the presence of significant residual lead deposits.

Based on the toxicological findings and occupational history, the Expert Committee for Occupational Diseases determined that the patient had developed a recognized occupational disease—chronic lead poisoning. The patient was declared permanently unfit for work involving exposure to lead or other neurotoxic substances.

Keywords: Lead, chronic poisoning, occupational disease.

Associations of sputum eosinophilia with pulmonary function and respiratory symptoms in bakery workers

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Background: Occupational flour inhalation has been a culprit in commence of several pulmonary maladies, such as asthma. The flour particle is one of the most important factors which can cause occupational chronic respiratory disorders. We examined the relationship of occupational wheat flour inhalation in bakery and supermarket employees with pulmonary function, respiratory symptoms, and sputum eosinophilia for determining hyper-responsiveness.

Methods: 110 subjects from traditional bakeries and 137 subjects from supermarket employees were enrolled in a cross-sectional study in Iran. Flour exposure concentrations, respiratory signs, sputum analysis, and respiratory volumes and capacities were measured based on the standard methods. An independent sample t-test was applied for analyses.

Results: Respirable concentration of flour in the bakery workers was two to four-fold of ACGIH's threshold limit value in which bread-bakers with 2.2 mg/m³ experienced maximum exposures among all job titles in the bakeries. The supermarket employees had not exposure to flour dust. The respiratory volumes in both bakery and supermarket employees were in the normal range. However, the median of voluminal percentage in bakery workers except forced vital capacity was reduced ($p < 0.001$). The mean respiratory volume of bread-bakers was reduced compared with supermarket employees ($p < 0.05$). In addition, we observed increased respiratory symptoms in the bakery workers, again more prevalent in the bread-bakers. There was a significant correlation between flour exposure concentration and sputum eosinophilia in which the percentage of eosinophilia in the bread-bakers was more than other bakery and supermarket employees. Albeit there were reductions in the respiratory volumes, results indicate no obstructive spirometric pattern.

Conclusion: Noteworthy, sputum eosinophilia might be a suitable screening method to detect airway hyper-responsiveness in workers exposed to known asthmogens.

Keywords: sputum eosinophilia test, pulmonary function tests, wheat flour

Trends of Work-related Traffic and Vehicular Injuries in the Philippines from 2010-2020

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Introduction: Work-related traffic and vehicular injuries affect the economic productivity of the working population. **Objective.** This study aims to provide an overview of the work-related traffic and vehicular injury trends in the Philippines from 2010 to 2020, and identify risk factors affecting work-related TVCs. **Methodology:** The Online National Electronic Injury Surveillance System (ONEISS) of the Department of Health (DOH) was used in obtaining work-related road injuries in the Philippines from 2010 to 2020. **Results:** There is a total of 15,451 work-related traffic and vehicular accident from 2010-2020. Work-related TVC cases and deaths continue to rise in the Philippines, specifically from 2010 to 2019. From 910 cases reported in 2010, this has increased to 2,180 cases in 2019. Deaths also increased from 6 to 28 cases from 2010 to 2019. The number of TVC cases and deaths dipped in 2020 due to the pandemic. Alcohol (4.59%) and sleep (1.03%) are the most common risky driving behaviors committed by victims of work-related TVCs. More than half of the victims did not practice safe driving behaviors (70.90%). Meanwhile, helmet (70.90%) is the most used safety gadgets among victims who reported to have practiced safe driving behaviors. The most common injuries sustained by victims are abrasions (n=9,016), multiple injuries (n=8,288), and open wounds (n=4,090). Inferences show that the risk for multiple injuries increases with motorcycle (OR = 1.257, 95% CI [1.171-1.349]), alcohol (OR = 1.867, 95% CI [1.576-2.213]), and sleep (OR = 1.524, 95% CI [1.076-2.158]. The risk of death increases with age (OR = 1.023, 95% CI [1.011-1.035]), and motorcycle (OR = 0.307, 95% CI [0.208-0.452]) as the vehicle type used. **Conclusion:** Road safety is a multi-sectoral collaboration. The government, employers, and workers should give importance to road safety education and related strategies to prevent work-related TVCs.

Keywords: Traffic Medicine, Work-related traffic injuries, Alcohol Intoxication

Acute Ammonia Poisoning as an Occupational Injury: A Case Report

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Introduction: Ammonia (NH₃) is a colorless gas with a pungent odor, characterized by high water solubility and pronounced caustic effects on mucous membranes. Classified as an upper respiratory tract irritant, it is widely used in refrigeration systems and chemical production. Clinical manifestations usually occur immediately, including cough, dyspnea, and mucosal irritation. A latent period of up to 72 hours may precede sudden deterioration and non-cardiogenic pulmonary edema. **Aim:** To present a case of occupational injury due to acute ammonia exposure, emphasizing the course of treatment and the assessment of work ability. **Case report:** A 43-year-old female construction technician employed in the food industry sustained an occupational injury during ice cream production. She was exposed to high concentrations of ammonia due to a refrigeration system leak, immediately developing cough, dyspnea, and mucosal irritation. She was hospitalized at the National Poison Control Center, where acute ammonia intoxication with acute bronchial obstruction was diagnosed. Treatment involving oxygen therapy, bronchodilators, and corticosteroids led to gradual clinical improvement. Follow-up in 2021 showed normal spirometry and a negative methacholine test. The Expert Committee established no permanent impairment or complete loss of work ability. The patient was declared fit for her primary profession but unfit for work involving respiratory irritants. **Conclusion:** This case highlights the necessity of timely diagnosis, treatment, and appropriate work ability assessment. It emphasizes the importance of preventive measures and regular monitoring of industrial refrigeration systems to prevent occupational injuries.

Keywords: ammonia, poisoning, occupational injury, work ability

Relationship between Psychosocial Factors and Presenteeism among Teachers in Elementary and Secondary Schools

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Presenteeism is when an employee is constantly present at work despite being unwell, resulting in reduced productivity or negative consequences. The study aims to establish a correlation between psychosocial factors and presenteeism among teachers.

Objectives: To examine the relationship between psychosocial factors and presenteeism at the workplace. This cross-sectional study was conducted with 174 teachers in the elementary and secondary schools in Lukavac in 2022. Psychosocial factors, presenteeism, and health state with work performance are assessed by the Occupational Stress Questionnaire (short form), Stanford Presenteeism Scale (SPS-6), and parts of the Work Ability Index. Study respondents' presenteeism is associated with the ability to apply knowledge work, phases that are too heavy to work, and mental and physical stress ($P = 0.001$). Presenteeism is not associated with time constraints on the task execution. So a person who experience presenteeism significantly less may affect the things that concern them at work ($P = 0.001$); have a significantly lower level of support from superiors ($P = 0.001$); more assessed relationships between colleagues at worse ($P = 0.020$); less can use the knowledge and expertise to work ($P = 0.004$); less satisfied with their work in the category of very satisfied ($P = 0.001$); are less satisfied with their health ($P = 0.001$) and life ($P = 0.035$); have less physical activity at work ($P = 0.001$); compared to those with no experience presenteeism. Presenteeism is significantly correlated with modifying factors: job satisfaction, life satisfaction, and health status. There are statistically significant differences in the perception of exposure to psychosocial factors and distress in patients who experience presenteeism compared to those who do not.

Keywords: workplace psychosocial factors, presenteeism, teachers, job satisfaction, life satisfaction, health state

POSTER SESSIONS



Study of occupational stress as a psychosocial hazard at a Manufacturing Industry

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The automobile manufacturing sector is a labour-intensive industry characterised by mechanised production processes, repetitive tasks, and strict production targets. While physical hazards are well recognised in manufacturing units, psychosocial hazards remain comparatively under-addressed. Psychosocial hazards arise from the interaction of work demands, organisational structure, work environment, and workers' psychological and social responses, all of which contribute to occupational stress. The Occupational Stress Index is a validated instrument for assessing occupational stress as a psychosocial hazard. To assess the occupational stress and identify key psychosocial stressors among workers using the Occupational Stress Index. A cross-sectional study was conducted among 30 manufacturing workers. Occupational stress was assessed using the standardized Occupational Stress Index questionnaire, which evaluates multiple domains including role overload, role ambiguity, role conflict, powerlessness, poor peer relations, strenuous working conditions, and low status. Data analysed using descriptive statistics and stress levels were categorized as low, moderate, and high based on OSI scores. 30 participants were assessed using the Occupational Stress Index (OSI). The overall mean OSI score was 111.4 ± 9.7 , indicating a moderate level of occupational stress. Domain-wise analysis showed relatively higher mean stress scores in role overload (16.7), strenuous working conditions (11.7), and unreasonable group and political pressure (11.04). Moderate stress was also observed in the domain of responsibility for persons (8.9). Lower mean scores were noted in role ambiguity (8.1), powerlessness (6.6), under-participation (8.3), intrinsic impoverishment (8.21), low status (6.1), and unprofitability (6.1), indicating comparatively lower stress levels in these domains. The study demonstrates a moderate level of occupational stress among participants, predominantly influenced by workload-related and organizational factors, including role overload, strenuous working conditions, and group-related pressures. These findings highlight the importance of organizational interventions focusing on workload regulation, improvement of working conditions, and supportive management practices to reduce occupational stress and enhance employee well-being.

Keywords: Psychosocial hazards, Occupational stress, Occupational Stress Index, Manufacturing workers

Adenocarcinoma of the Lung in a Worker Employed in a Zone of Ionizing Radiation, Occupational Disease or Not - Dilemma

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Introduction: Lung cancer is the leading cause of cancer-related morbidity and mortality worldwide. According to the World Health Organization (WHO), it accounts for more than one million deaths annually. Multiple etiological factors contribute to the development of lung cancer, including age, sex, genetic predisposition, lifestyle, respiratory infections, and environmental and occupational exposures such as asbestos, ionizing radiation, chromium, nickel, arsenic, beryllium, cadmium, and aromatic hydrocarbons. The International Agency for Research on Cancer (IARC) classified Radon as a human carcinogen and identified it as the second most important cause of lung cancer after smoking.

Objective: To present a case of lung adenocarcinoma in a worker occupationally exposed to ionizing radiation and to discuss the potential occupational contribution to the disease.

Case Report: The patient, a mechanical technician–designer, worked for 16 years in an ionizing radiation area. During his employment, several accidental exposures occurred while repackaging nuclear fuel. Periodic occupational health examinations were regularly conducted from 2011 to 2022, and the worker was repeatedly declared fit for work in the radiation zone. Cytogenetic analyses remained within reference values. According to thermoluminescent dosimeter monitoring, the cumulative radiation dose was 6.24 mSv in 2009–2013 and 10.40 mSv in 2013–2023 (0.16–1.38 mSv annually), within permissible occupational limits. The patient had a 30-year smoking history (20 cigarettes per day) and stopped smoking in November 2022. In December 2022, he was diagnosed with Lung adenocarcinoma. No family history of malignancy was reported.

Conclusion: The expert commission determined complete loss of working ability. However, the disease was not recognized as an occupational disease, leaving open the question of the possible contribution of occupational ionizing radiation exposure.

Keywords: lung cancer, lung cancer, smoking, assessment of work ability

Long-term sickness absenteeism among healthcare personnel in the Sousse region

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Aim: The objective of this study was to assess the rate of absenteeism for long-term illness among healthcare workers in the Sousse governorate, and to identify socio-professional characteristics of these professional and main associated risk factors.

Material and Methods: The current survey was designed as a retrospective descriptive exhaustive study covering a six-year observation period. The investigations were carried out at the Regional Health Directorate of Sousse. Data collection was based on medical and administrative records of healthcare professionals of the governorate of Sousse, who had been granted long-term sick leave. A pre-established synoptic survey sheet, was used to collect socio-professional and medical data notably clinical indications of prescribed long-term sick leave.

Results: In total, our study includes 401 healthcare workers during the period of five years. Within this population, the absenteeism rate was equal to 7.91%. Socio-demographic profile of included workers objective a mean age of 49 years, with a female predominance reaching 86%. Univariate statical analysis concluded to a strongly correlation between absenteeism and multiple determinants, including individual factors such as age, as well as professional variables like job position, the type of healthcare facility, and specific workstation characteristics. Furthermore, medical characteristic notably medical indication for long-term sick leave. Notably, psychiatric disorder and pathology, specifically depressive disorders, were the leading cause of long-term sick leave among the surveyed personnel.

Conclusion: Action strategies focused on workplace interventions appear to be relevant. The role of the primary care physician is crucial through early and appropriate management. The function of the occupational physician is essential due to its legislative and preventive role.

Keywords: Sickness Absenteeism, Healthcare Workers, Long-term Sick Leave, Occupational Risk Factors, Psychiatric Disorders

Occupational Risk Prevention and Safety Optimization: The Contribution of Ergonomic Intervention in a Screen-Printing Workshop

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Objective: To analyze screen-printing operators' activity within a textile company, identify major associated risks and implement appropriate corrective measures to enhance safety and promote occupational health.

Methodology: The methodology was based on open and systematic observations, structured interviews, and consultative meetings with a multidisciplinary working group (operators, managers, and direction representatives). Movements within the workshop were mapped through a physical flow study (Spaghetti Diagram).

Results: Key identified workshop activities included the reception and sorting of cut pieces; preparation of films, polymerization prototypes, and client files; color formula mixing; drying; and quality control and shipping. Chemical, accidental, and physical workload-related risks were identified as priorities risks for workers health and safety. The working group agreed on the necessity of an in-depth chemical risk analysis using the SEIRICH software (Chemical Risk Evaluation and Information System of the French National Research and Safety Institute). For accidental, and physical workload-related risks, workspace clutter, obstructed circulation areas, and organizational dysfunctions were the primary identified causes. These risks and dysfunctions were most prevalent during the preparation phase which lasted 58 to 75 minutes, representing 21.6% of the manufacturing process (333 minutes). It involved movements of 60 to 185 meters, deemed "unnecessary". These movements were mainly related to the absence of a storekeeper in the mixing area, which generated an additional cognitive and physical load (risk of costly errors, multiple interruptions, and manual handling of loads). The creation and establishment of a dedicated storekeeper workstation in the mixing area, combined with the reorganization of workspaces and the layout of storage areas according to ergonomic standards, reduced the preparation phase by 20% and associated movements by 50%.

Conclusion: This ergonomic intervention optimized the workshop's organization, significantly reducing physical strain and associated occupational risks.

Keywords: Occupational Health and Safety, Ergonomic Intervention, Screen-printing, Physical Strain, Working Conditions

The Rule of Risk Assessments in Health Care Institutions

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The risk assessment file is a very important article for all the health institutions because it determines risk level for each work place, proposes preventive measures and gives a program of preemployment and periodical medical checkups. So, we can say it is crucial in maintaining the welfare of health workers.

Right risk assessment gives an opportunity to conceive and conduct adequate medical checkups taking in consideration all work tasks and potential risks they are accompanied with. Risks could refer to the health care process, work in ER, surgery, helping the immobile patients or could refer to organization of the health care process, for example night work.

Good risk assessment gives an opportunity to employers to choose the optimal candidate for a certain work place among many candidates. Why do we emphasize the importance of risk assessment files and why is it so important? Example: Work place nurse in emergency room in one huge hospital. This work place was not recognized as a work place with elevated risk. The young nurse was employed without any medical checkups. After a year and half she went on long term sick leave because she was diagnosed as having Rheumatoid arthritis. She returned to job after almost 3 years but not at her previous work place. If the risk assessment file had been done correctly that nurse would not have been employed, or not this work place and many problems that have shown in this case would have been escaped.

Keywords: risk assessment, periodical medical checkups, night shift

Risk and Safety Measures for Hospital Pharmacists in the Process of Working with Antineoplastic Drugs

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Introduction: Hospital pharmacists are at risk of exposure to antineoplastic drugs via the dermal, inhalation or oral route. Compliance with the rules for safe work is very important due to the potential carcinogenic, mutagenic, teratogenic and reproductive toxicity of antineoplastic drugs.

Aim: Characteristic of the implementation of regulatory requirements, hazardous exposures to antineoplastic drugs and control measures during the work of hospital pharmacists.

Material and methods: A cross-sectional study was conducted with the participation of 28 pharmacists and 28 assistant pharmacists in hospital pharmacies using an anonymous self-completed questionnaire sent to the participants online in the period 10.2024-04.2025. The processing was performed with the SPSS 23 statistical package.

Results: Gaps were identified in the implementation of the general requirements for hospital pharmacies when working with antineoplastic drugs - in terms of limiting access and signaling, cleaning the biosafety cabinet, training for cleaning spills and using kit sets. The data show the presence of spills in 58.5% of those working with antineoplastic drugs. As a result of spills and contact with the drug, allergic symptoms prevail. Only 59% of the subjects studied use kit sets for spills. The use of all types of PPE is insufficient. A large proportion of the surveyed pharmacists (51.8%) did not undergo periodic preventive medical examinations.

Conclusion: Stricter control is needed in compliance with the rules of good practice regarding regular training of workers, use of PPE, management of spills, general safety rules. The scope of periodic preventive medical examinations should be adequate.

Keywords: hospital pharmacists, antineoplastic drugs, biosafety cabinets, personal protective equipment

Stress and Burnout Among Teachers

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The teaching profession is stressful, and the mental health of teachers is a significant social issue directly linked to the quality of education. According to the OECD (2025), 52% of teachers report symptoms of stress, depression, and anxiety. The main stressors include workload, administrative duties, lack of work-life balance, communication with parents, and frequent educational reforms. In Bulgaria, the teachers also identify maintaining discipline, responsibility for academic outcomes, and working with children with special educational needs as stressful (OECD, 2025). However, beyond psychosocial factors, personal characteristics such as a predisposition to depression and anxiety also influence occupational stress and professional burnout. The study conducted by TALIS (2025) provides limited data on the causes and the relationship between occupational stress and burnout syndrome among Bulgarian teachers.

The present study aims to find out: 1) the prevalence of stress, burnout, and anxiety among teachers; 2) psychosocial factors and personal characteristics as predictors of high stress levels; 3) the extent to which occupational stress, combined with anxiety and depression, is a predictor of burnout syndrome.

The study covers teachers from all levels of the educational system (primary, lower and upper secondary), with a sample of 1,000 teachers selected through voluntary random sampling. Participants will complete an anonymous online questionnaire containing demographic data, questions about working conditions, the short version of the Copenhagen Psychosocial Questionnaire, the Perceived Stress Scale, the Maslach Burnout Inventory, and the Hospital Anxiety and Depression Scale. Data will be processed using descriptive statistics, correlation and regression analysis with SPSS.

The expected results will provide up-to-date data on teachers' mental health, a comprehensive assessment of psychological burden, and the interrelationships between stress, anxiety, depressive states, and burnout. The findings will serve as a basis for developing targeted interventions and policies to support the mental health of teachers.

Keywords: teachers, occupational stress, burnout, psychosocial factors

Analysis of Morbidity Among Health Care Workers Occupationally Exposed to Ionizing Radiation in an Oncology Hospital

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The estimated number of workers involved in medical uses of ionizing radiation (IR) is about 9 million workers worldwide, highlighting the importance of continuous monitoring of their health status. The periodicity and components of pre-employment and periodical health examinations are legally defined, with particular emphasis on radiosensitive tissues and organs. **Aim:** The aim of this study was to analyze morbidity among occupationally IR exposed health care workers in an oncology hospital. **Material and Methods:** A retrospective study analyzed data obtained from medical records of periodic examinations of employees in an oncology hospital during 2018. All participants underwent hematological and biochemical blood analyses, spirometry, electrocardiography, cytokinesis-block micronucleus assay, and ophthalmological examination, as mandatory components of periodic health examinations. The categorical variables were presented as frequencies (n, %), and continuous variables were expressed as median (minimum–maximum). The prevalence rate (PR) was calculated (total case/total population x 100). Statistical analyses were performed using SPSS version 17.0. **Results:** The study included 123 workers employed in nuclear medicine, radiotherapy, a diagnostic center, and surgery. The median age was 42 years (24–64), with an median occupational IR exposure of 14 years (1–36). Most participants were female (61.8%). The largest group consisted of radiology technicians (38.2%), followed by radiologists (16.3%) and oncologists (9.8%). Pathological conditions were identified in 89 workers, with a total of 180 diagnoses according to ICD-10 (PR: 146.3). Endocrine and metabolic diseases were most common (PR: 59.3), primarily dyslipidemia (33.3%), thyroid diseases (13.8%), obesity (7.3%), and diabetes mellitus (4.1%). Arterial hypertension was the most frequent cardiovascular disease (14.6%). White blood cells abnormalities were found in 19.5% of workers. Increased micronucleus frequency was detected in one worker (0.8%). **Conclusions:** These findings emphasize the need for workplace health promotion programs aimed at reducing risk factors and preserving work ability.

Keywords: Ionizing Radiation, Health Care Workers, Periodical Health Examinations

Work Status among Hodgkin Lymphoma Survivors: A Crosssectional Study

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Aim: To evaluate occupational outcomes among Hodgkin lymphoma (HL) survivors and associated factors.

Methods: A cross-sectional study included patients diagnosed with HL at Monastir Hematology Department between 2016 and 2024, aged between 18 and 65 years at diagnosed time, and who had completed their treatment protocol at least one year prior to inclusion. Sociodemographic, clinical and professional data were collected from medical records and patient interviews.

Results: Among the 71 participants, the sex ratio was 1.44 and the mean age 34years $\pm$ 11, with 76.1% of them under 40 years and with early-stage diagnosed HL in 52.1% of cases. At diagnosis, among participants 80.3% (N=57) were employed, as manual workers in 72% of cases; as contractual employees in 43.9% and as independent in 33.3% of cases. Among them, 89.5% had taken a sick leave; varying from 2 to 12 months, with 45.6% experiencing long-term absence. A significant association was noted between professional category and sick leave duration ($p = 0.028$) with blue-collar workers more prone to long-term sick leave. Moreover, patients suffering from greater physical fatigue and those with prior medical history, other than LH, were more likely to experience long-term sick leave ($p = 0.048$). At survey inclusion, 49.1% of initially active LH survivors remained in their pre-diagnosis work positions. Of the 50.9% who left their initial position, 51.7% were unemployed. Significant predictors of work status changes included younger age ($p = 0.019$), marital status ($p = 0.034$), and professional category ($p = 0.017$).

Conclusion: Hodgkin lymphoma survivors, predominantly young, face significant risk for professional disengagement. While, maintaining employment is crucial for long-term recovery of these patients and their quality of life. Multidisciplinary medical care must facilitate workplace reintegration as a therapeutic priority.

Keywords: Hodgkin lymphoma, Survivorship, Workplace reintegration, Disability, Professional disengagement

The Role of Psychopathological Personality Traits in the Work Ability Assessment: The Experience of the Serbian Institute of Occupational Health

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Introduction: Work capacity is a multidimensional construct involving cognitive, emotional, and interpersonal resources necessary for stable and efficient professional functioning. Personality disorders, as defined in ICD-11, represent persistent behavioral patterns that can impair functioning and pose specific challenges in work capacity assessment. ICD-11 introduces major changes compared to ICD-10, replacing categorical diagnoses with two main criteria: severity of the disorder (mild, moderate, severe) and dominant traits across five domains—negative affectivity, dissociality, detachment, disinhibition, and anankastia. These changes significantly affect evaluations of work ability.

Methods: This study is based on the clinical experience of the Serbian Institute of Occupational Health, involving employees referred for targeted medical examinations and work capacity assessments due to occupational dysfunction. Data were supplemented with a review of relevant literature and a conceptual analysis of the ICD-11 dimensional model of personality disorders and its application in psychiatric assessment.

Objective: To analyze the role of psychopathological personality traits in work capacity assessment, with emphasis on their impact on professional adaptation, emotional regulation, stress tolerance, and quality of interpersonal relationships.

Conclusion: The presence of a personality disorder does not automatically imply work incapacity. However, it can reduce work efficiency, disrupt interpersonal relationships, and contribute to a negative workplace atmosphere, affecting collective work dynamics. Accurate assessment requires an individualized, multidisciplinary approach that evaluates functional abilities and adaptive potential, prioritizing practical outcomes over diagnostic labels. Understanding psychopathological traits is crucial for optimizing professional adaptation, supporting workplace well-being, and guiding targeted interventions to maintain effective work performance.

Keywords: Work ability assessment, psychopathological personal traits, personal disorders, DSM11

Prevalence and Impact of Musculoskeletal Disorders among Physiotherapists in Sousse: A Cross-Sectional Clinical Study

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Aim: The objective of this study was to determine the prevalence and impact of musculoskeletal disorders (MSDs) among physiotherapists in order to propose strategies for improving working conditions.

Methods: A cross-sectional descriptive study was conducted over a two-month period among physiotherapists practicing in public and private hospital structures of the Sousse region (multispecialty clinics and university hospital centers). Socio-professional and medical data were collected during a structured interview, followed by a clinical examination (Body Mass Index (BMI), Visual Analogue Scale (VAS) and examination of the musculoskeletal system).

Results: The study included 40 physiotherapists with a female predominance (72%). The public sector was the most represented (60%). The population had a mean age of 41.2 years, professional seniority exceeding 15 years in 65% of cases, and a mean body mass index (BMI) of 24.75 kg/m². On average, a physiotherapist treated 8 patients per day with a mean of 40.10 working hours per week. High repetitiveness in work tasks was reported by 77.5% of physiotherapists, with a mean score of 8. The 12-month prevalence of MSDs was high, specifically affecting the lower back (55%) and the neck (60%). The mean intensity of low back pain was the highest, reaching 10 on the Visual Analogue Scale (VAS). Painful limitation of lumbar extension was noted in 32.5% of participants, along with lumbar stiffness, indicated by a mean Schober's test result of 14.79 cm. Muscle endurance was reduced, particularly for the lumbar flexors and extensors (54.41 s) and the lower limbs (36.53 s).

Conclusion: Despite their expertise in anatomy and biomechanics, physiotherapists remain a high-risk population for MSDs. These results highlight the crucial importance of strengthening training in self-protective movements and postures to combine therapeutic safety with professional comfort.

Keywords: Musculoskeletal Disorders, Physiotherapists, Ergonomic Risk Factors, Low back pain, Visual Analogue Scale, Occupational Health

Socio-professional and clinical characteristics of silicosis in the private sector in central Tunisia

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Aim: To describe the clinical, occupational, and medico-legal characteristics of occupational silicosis within the private sector in Tunisia. **Material and Methods:** A retrospective study conducted among private sector workers with declared silicosis, from January 1, 2002 to December 31, 2021, at the National Health Insurance Fund (CNAM) in the Sousse region. Data collection was based on a pre-established synoptic sheet including the participants' socio-demographic, occupational, and medical data. **Results:** In total, 42 cases were identified with a male predominance (90.5%). The mean age was 47.64 years, with extremes ranging from 27 to 71 years. Smoking was noted in 46.4% of the workers. The most common sectors of activity were non-metallic mineral products (24 cases), followed by the metallurgy and metal transformation sector (7 cases). The mean occupational seniority was 16.69 years. The mean duration of exposure to crystalline silica was 15.78 years. Dyspnea was the leading symptom, reported in 95.3% of cases. Thoracic CT scans, performed in 40 patients, showed an interstitial syndrome consisting of micronodules (25 cases), pulmonary fibrosis (6 cases), and associated emphysema (9 cases). Recognition of silicosis as an occupational disease by the CNAM was granted in 72.2% of declared cases. The reasons for rejection were secondary to non-compliance with the conditions of the occupational disease schedules. Nearly half of the patients (45.2%) lost their jobs, while a minority were able to resume the same position (4.8%) or benefit from a job reallocation (2.4%). **Conclusion:** Occupational silicosis remains a major health issue at work in Tunisia, particularly in the private sector. This study highlighted the severity of pulmonary impairment, the frequency of job loss, and the limitations of medico-legal recognition. It calls for an improvement in prevention measures and management of exposed workers.

Keywords: Dust-related Lung Diseases, Occupational Silicosis, Crystalline Silica Exposure, Medico-legal Recognition, Professional Impairment

Professional burnout among healthcare workers

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Burnout syndrome develops as a result of prolonged exposure to frequent stressful situations in the workplace and represents a set of physical and psychological symptoms of exhaustion that appear as a delayed response. It can lead to changes in behavior and to disorders affecting various organs and systems, feelings of helplessness, hopelessness, and resentment. Depending on the degree of health impairment, reduced, partial, or complete loss of work ability may occur. Aim: To examine the extent to which symptoms of burnout are present among healthcare workers. Methods: Survey using the questionnaire to determine degree of Burnout Syndrome according to Freudenberger's burnout scale. Results: Out of 200 randomly selected, surveyed primary level healthcare workers, only 22 percent had normal results. Thirty-four percent were in the risk zone for developing symptoms, while 36 percent were candidates for the development of Burnout Syndrome. Eight percent of respondents already exhibited symptoms of professional burnout, while, fortunately, full burnout was not recorded. Regarding age. Across all age groups, the number of individuals at risk was relatively similar, whereas candidates for developing the syndrome were mostly between 30 and 59 years of age. No developed burnout symptoms were found among the youngest or the oldest group. Conclusion: Occupational strain and the risk of burnout are present among a significant portion of employees in primary healthcare, with a smaller but important share already showing developed symptoms, while full burnout was not identified. The findings point to the need for preventive measures aimed both at supporting individuals and at implementing organizational strategies that reduce exposure to stress, improve working conditions, and enable a sustainable work pace. Timely recognition and intervention can prevent deterioration, and organizational approaches to prevention indicate that changes in work organization are essential for long-term effect.

Keywords: stress, burnout, occupational safety and health

Artificial Intelligence in Occupational Medicine: Opportunities, Risks, and Conditions for Responsible Integration — A Narrative Review

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Background: Artificial intelligence (AI), including machine learning and generative AI, is increasingly integrated into occupational health and safety (OSH) and occupational medicine (OM). While AI offers new opportunities for prevention, surveillance, and workflow optimization, its deployment in workplace settings raises specific ethical, clinical, and regulatory concerns. **Objective:** To synthesize recent scientific literature (2024–2026) on AI applications in occupational medicine and OSH, highlighting documented benefits, limitations, and conditions required for responsible implementation. **Methods:** A narrative review of recent peer-reviewed studies and major institutional guidance addressing: (i) AI for hazard identification and injury prediction; (ii) AI-supported occupational health surveillance and documentation; (iii) risks including bias, privacy concerns, hallucinations in generative AI, and psychosocial impacts of algorithmic management; and (iv) emerging governance and regulatory frameworks. **Results:** Recent systematic reviews indicate that AI in OSH is primarily used for predictive analytics, sensor-based monitoring, and hazard detection, supporting preventive targeting and risk prioritization. However, real-world effectiveness data remain heterogeneous. In OM services, generative AI tools may reduce administrative burden through documentation support, yet hallucinations and omission errors represent clinically and legally significant risks. Evidence also links AI-driven and algorithmic worker management to increased psychosocial risks, including reduced autonomy and work intensification. Concerns regarding bias and inequitable outcomes are particularly salient in high-stakes decisions such as fitness-for-work and return-to-work planning. Regulatory frameworks, including risk-based AI legislation and global ethical guidance, emphasize transparency, accountability, privacy safeguards, and mandatory human oversight for systems affecting health and fundamental rights. **Conclusion:** AI has the potential to enhance occupational medicine through improved prevention, surveillance prioritization, and workflow efficiency. Safe integration requires robust governance, bias auditing, data protection, and strict human-in-the-loop oversight, particularly for decisions with employment and rights implications.

Keywords: occupational medicine; occupational health; artificial intelligence; generative AI; algorithmic management; bias; privacy

Occupational Injuries in Bulgarian Healthcare Workers: Three-Year Analysis and Prevention Measures

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Occupational accidents (OAs) are a critical issue, highlighting the need for a thorough study. This review aims to summarize and synthesize the factors and cost drivers of OAs in healthcare workers. Materials and methods: We performed data synthesis to systematically observe from the Republic of Bulgaria Ministry of Labor and Social Policy. The search encompassed the period 2022 – 2024 for analysis. Results: A total of 131 injuries were reported in 2022, 129 in 2023, and 95 in 2024, demonstrating a clear downward trend (approximately 40% reduction over the period). A frequency coefficient was calculated (number of occupational accidents per 1,000 employed persons). The frequency coefficient for 2022 was 1.13, for 2023 – 1.08, and for 2024 – 0.74. Given the predominance of women in healthcare occupations, a higher proportion of occupational injuries (approximately 65%) has been observed. Injuries among female workers constituted 69.8% in 2023 and 67.4% in 2024. Sickness absence decreased substantially from 11,268 days in 2022 to 5,895 days in 2024, corresponding with the reduction in injury frequency and the absence of severe cases. Fatalities were recorded only in 2023 (n = 3). Out of all workplace incidents in 2022, 7 resulted in permanent disability. Conclusion: Although occupational accident rates in the healthcare sector show a declining trend, the high proportion of affected women and the fatalities in 2023 underscore the urgent need to enhance occupational injury reporting, safety training of employees, risk assessment, and prevention systems.

Keywords: occupational injury, healthcare workforce

Occupational Noise Exposure and Auditory Health in the Textile Industry

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Objective: To evaluate occupational noise exposure levels within the textile industry, and to assess auditory health among workers with such exposure.

Material and Methods: A cross-sectional study was conducted over three-month, among a random sample of workers of two textile industrial units. After the sociodemographic and clinical data collection, a clinical examination was conducted including otoscopy, air and bone conduction pure-tone audiometry and speech audiometry in case of hearing loss. A sonometer (ranging from 35 to 130 dB, accuracy: ± 1.5 dB) was used for noise exposure evaluation.

Results: The representative sample included 194 workers, with a mean age of 38.56 years, a professional seniority comprised between 10 and 20 years, in 32.5% of cases with 45.59% of women. Regarding workstations, the first unit, dedicated to production, comprised 4 blocks, 11 zones, and 29 workshops and administrative areas, while the second one, was dedicated to finishing and packaging, and divided into 3 zones and 9 workshops. The ironing and washing workshops included 19.1% and 13.4% of workers. These workers were exposed to noise varying from 60.15 to 85.3dB(A). The stain removal booth was the only area exposing workers to harmful levels (> 85 dB(A)). Otoscopy was strictly normal in 166 cases and 61.6% out of the 138 performed pure-tone audiometry, showed hearing impairment (mean hearing loss =20.9 dB). The hearing loss was identified in 18.1% of cases, with a bilateral symmetrical sensorineural hearing loss in 20 cases. These impairments significantly affected workers in the washing and brushing workshops. Speech audiometry showed a mean intelligibility threshold, without lip-reading, of 36 dB with discrimination rate about 87% at 65 dB and 96.2% at 58 dB. **Conclusion:** Prevention policies for auditory health preservation should implicate technical noise exposure reduction and hearing impairment early screening.

Keywords: Occupational Noise, Textile Industry, Hearing Loss, Audiometry, Work conditions

TMP-MAROC: A Mobile Application to Improve Access to Occupational Disease Regulations in Morocco

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Introduction: In Morocco, occupational diseases (OD) are regulated by Ministerial Decree No. 160-14 (2014), which establishes the official tables for recognition and compensation. However, consultation through paper or static PDF formats remains impractical in real-time clinical and medico-legal practice. **Objective:** To develop a bilingual (Arabic/French) mobile application providing rapid, structured, and user-friendly access to Moroccan OD regulatory tables. **Methods:** TMP-MAROC was developed using React Native to ensure cross-platform compatibility (iOS and Android), with an embedded SQLite database enabling secure offline access. Regulatory tables were extracted from official Arabic and French versions and integrated into a searchable database. The interface provides four entry points: by table number, disease, hazardous agent, and occupation/job title. The occupation-based search aligns regulatory criteria with real-world workplace scenarios, enhancing practical usability. **Results:** The application is available on the Apple App Store, with Android release forthcoming. Preliminary feedback from occupational health professionals indicates improved navigation efficiency and faster retrieval of regulatory criteria during consultations and expert assessments. **Conclusion:** TMP-MAROC translates a complex legal framework into an accessible digital tool, supporting modernization of occupational health practice in Morocco and offering a transferable model for improving regulatory access in other settings.

Keywords: Occupational diseases, Occupational health legislation, Digital health, Mobile application, Regulatory access, Medico-legal practice, Decision support tool, Health system digitalization, Occupational health policy, Workplace exposure

Impact of Winter Air Pollution Associated with Climate Variability on Lung Function among Office Employees in Noida, India: A Cross-Sectional Study

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Background: Climate change has intensified winter air pollution episodes in North India, with elevated fine particulate matter (PM_{2.5}) posing significant respiratory health risks. Office employees, often considered low risk, are still exposed through commuting and indoor infiltration.

Objective: To evaluate lung function impairment and small airway involvement in office employees during a severe winter air pollution episode in Noida, India.

Methods: A retrospective cross-sectional study was conducted on 29 male office employees (age 25–53 years). Spirometry parameters (FVC, FEV₁, FEV₁/FVC, PEF, FEF_{25–75}) were obtained during routine occupational health checks on 1st December 2025, when AQI was in the hazardous range due to PM_{2.5}. Spirometry patterns were classified using GOLD criteria (FEV₁/FVC <70% obstructive; 70–74.9% borderline; ≥75% normal). Small airway dysfunction was defined as FEF_{25–75} ≤2.0 L/s. Descriptive statistics and correlation analyses were performed.

Results: Mean FEV₁/FVC was 76.3% ± 12.7. Spirometry patterns showed 79.3% normal, 6.9% borderline, and 13.8% obstructive airflow limitation. Small airway dysfunction was observed in 17.2% of participants. Age negatively correlated with FEV₁/FVC ($r = -0.47$), while FEF_{25–75} correlated strongly with FEV₁ ($r = 0.79$), indicating early subclinical airway involvement. This highlights potential vulnerability even in asymptomatic employees.

Conclusion: Acute winter air pollution, exacerbated by climate variability, is associated with measurable lung function impairment among office employees in Noida. Routine occupational health surveillance, adaptive workplace strategies, and AQI-based advisories are essential to mitigate environmental health risks.

Keywords: winter air pollution, climate change, small airway dysfunction, spirometry, pm 2.5

Association between workers' health and adopted physical activity and dietary patterns: A cross-sectional clinical survey

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Aim: To assess lifestyle habits among patients with occupational diseases and their impact on health profiles. **Material and Methods:** A cross-sectional survey was conducted among patients followed for occupational diseases in a Tunisian occupational medicine department. After obtaining consent, data collection was based on medical records and supplemented during telephone interviews by answering the SF-12 quality of life (QoL) questionnaire, the Pichot Fatigue Scale, the IPAQ (International Physical Activity Questionnaire), the STC (Starting the Conversation), and the VDQ (Short Vitamin D Questionnaire). **Results:** Among the 351 included patients, 72 responded to the telephone survey. The mean age was 50.0 ± 8.6 years. Musculoskeletal disorders represented 94.4% of declared occupational diseases. Among responders, 47.9% had a degraded physical QoL (mean score 42.22 ± 9.12) and 52.1% a degraded mental QoL (mean score 39.48 ± 11.32). Significant to extreme fatigue was noted in 11.1% of cases, with a mean Pichot score of 12 ± 5 . Regular physical activity was practiced by only 6.8% of respondents. Healthy dietary habits were adopted by 4.2% of them, while "partially balanced" diets were reported by 73.6%, and "unhealthy" habits by 22.2%. Mean daily vitamin D intake was $2.2 \pm 4.9 \mu\text{g/day}$ [0.8-3,3] and was insufficient in 91.7% of cases. Unhealthy dietary habits were significantly associated with lower coping ability ($p=0.001$), moderate to severe concentration difficulties ($p = 0.025$), and a history of musculoskeletal disorders ($p = 0.001$; OR = 20.5, 95% CI: 4.98–84.80). Moreover, vitamin D intake deficiency was associated with an inability to enjoy day-to-day activities ($p = 0.014$; OR = 2.96, 95% CI: 1.85–4.73). **Conclusion:** Promoting a healthy diet and lifestyle is essential for reducing morbidity, supporting health, and maintaining work performance among adults in the workforce.

Keywords: Dietary Patterns, Physical Activity, Health conditions, Quality of life

Medical innovations in the 21st century advance the healthcare industry

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Occupational medicine, as a multidisciplinary activity, is aimed at protecting and improving the health of employees, controlling illnesses and injuries at work, assessing risks at work and reducing them, developing the working capacity of workers and enabling the physical, mental and social well-being of employees, all in accordance with current regulations and laws. Current laws on which it is based are: Law on Safety and Health at Work; Healthcare Law; Law on Health Insurance; Law on Pension and Disability Insurance o Labor Law. In accordance with the Law on Occupational Health and Safety ("Official Gazette of Montenegro", no. 34/2014 and 44/2018). In recent years, innovations, achievements in information and nano technologies, and their application have been a radical transformation in medicine. The contribution and benefit of innovative technologies in medicine is evident. Advances in medical technology and technological innovation can significantly improve the chances of a positive surgical outcome. The World Health Organization states that innovations in the digital domain are transforming the global healthcare industry. Five innovations that are pushing the boundaries of healthcare: 1. Artificial intelligence - AI; 2.The use of 3D printing in medicine is on the rise; 3.Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) gene editing technique has the potential to transform the way we treat diseases and could make a huge step forward in the fight against cancer or HIV in just a few years; 4.Virtual Reality (VR) and Augmented Reality (AR) are technologies that are increasingly being used in medicine, such as improving the process of operations, helping to reduce color or treating mental conditions. 5.Smart bandages and patches that use sensors to monitor wound healing help in faster wound healing, increase blood flow to damaged tissue and improve skin healing by significantly reducing scar formation.

Keywords: Occupational medicine, innovations in medicine, digitization

Health status and psychophysical fitness among healthcare workers occupationally exposed to ionizing radiation

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Introduction: Occupational exposure to ionizing radiation represents a health risk for healthcare workers, particularly radiologists and radiologic technologists. The risk is associated with improper use of radiation sources and inconsistent application of protective measures.

Aim: To assess the health status and psychophysical fitness of workers occupationally exposed to ionizing radiation.

Materials and Methods: The study included 30 healthcare workers (radiologists and radiologic technologists) from the Health Center – Skopje. All participants underwent periodic preventive examinations during January–February 2026.

Results: The majority of participants reported being sufficiently informed about the risks and consistently using personal protective equipment. In 20% of participants, exposure to low doses of ionizing radiation was recorded, with an average annual dose of 3 mSv, representing approximately 15% of the maximum permitted occupational limit of 20 mSv (according to the recommendations of the International Commission on Radiological Protection – ICRP). Arterial hypertension was observed in 16.7% of participants, diabetes mellitus in 3.3%, gastrointestinal diseases in 3.3%, and thyroid function abnormalities in 23.3%. Elevated blood glucose levels were recorded in 6.7% of participants, elevated cholesterol in 13.3%, and triglycerides in 10%. Hearing impairment was found in 6.7%, while visual impairment was present in 33.3% of participants. Increased levels of neuroticism were observed in 10% of participants, indicating a higher tendency toward anxiety, tension, and stress reactions. All participants were assessed as fit for work.

Conclusion: Although exposure levels are generally within the prescribed limits, there is a need for continuous monitoring, education, and further improvement of radiation protection measures. Special emphasis should be placed on the consistent use of protective equipment and regular health monitoring to reduce potential risks.

Keywords: ionizing radiation, healthcare workers, radiologists, radiologic technologists, occupational exposure, psychophysical fitness, radiation protection

Influence of Exposure to Pesticides on Biochemical Parameters in Orchard Workers

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Introduction: Organophosphates and Carbamates, frequently used pesticides in agriculture, can cause a variety of adverse health effects. **Aim:** To examine several biochemical parameters in the serum of orchard workers with occupational exposure to pesticides. **Material and methods:** The study included 47 peach orchard male workers from Strumica region in the Republic of North Macedonia, aged from 19 to 60 years with monthly exposure to pesticides from 5 to 20 days. All workers were supplied with protective equipment and were well trained for pesticides use. The control group consisted of 40 healthy age-matched men, without occupational exposure to pesticides. The serum concentration of glucose, total protein, albumin and activities of alanine aminotransferase (ALT), aspartate aminotransferase (AST), gamma glutamyl transferase (GGT), alkaline phosphatase (ALP), acetylcholinesterase (AChE) and creatine phosphokinase (CPK) were measured by using standard spectrophotometric assays. **Results:** There was statistically significant increased serum concentration of glucose and decreased concentration of albumin in orchard workers compared with the control group ($p = 0.00$). Statistically significant increased activities of ALP ($p = 0.00$) and CPK ($p = 0.00$) and significantly decreased AChE ($p = 0.00$) activity were detected in orchard workers in comparison with the control group. The weak negative correlation between AChE and CPK activities ($r = 0.25$, $p = 0.02$) was observed in orchard workers on chronic exposure to pesticides. **Conclusion:** The results have shown that orchard workers with decreased serum AChE activity and increased CPK activity should be monitored as workers with greater risk for severe pesticide poisoning. These findings suggest that chronic occupational exposure to pesticides of lower toxicity elicit biochemical changes of unknown long-term consequences.

Keywords: Pesticides, Orchard workers, Occupational exposure, Serum glucose concentration, Serum albumin, Serum enzymes activities

Predictors of Turnover Intentions among Administrative Workers: The Impact of Family–Work Conflict and Engaging Leadership

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Background: Administrative roles in contemporary work environments face evolving psychosocial stressors, where the boundaries between professional and personal life are frequently blurred. In the context of occupational health, identifying factors that drive workforce instability is crucial for developing targeted organizational interventions. **Aim:** To evaluate how various dimensions of the work–family interface and perceptions of engaging leadership influence turnover intentions among administrative professionals in a Macedonian context. **Methodology:** A cross-sectional study was conducted among 120 administrative workers (55% female, mean tenure 16.9 years). Validated questionnaire assessed work-conflict (WFC), family-work conflict (FWC), work-life balance (WLB), turnover intentions (TOI), and engaging leadership (ELS), with its 4 dimensions. Data analysis included bivariate correlations to establish initial relationships, and hierarchical multiple regression to identify unique predictors of TOI while controlling for demographic variables. **Results:** Psychometric instruments demonstrated high internal consistency (Cronbach alpha= 0.74-0.86). Correlation analysis revealed that FWC was the most significant positive predictor of TOI ($r = 0.24$, $p = 0.007$), while ELS showed a significant negative correlation ($r = -0.26$, $p = 0.005$). Among the leadership dimensions, "Strengthening" ($r = -0.27$, $p = 0.003$) and "Connecting" ($r = -0.24$, $p = 0.010$) demonstrated the strongest negative associations with the intent to leave. Furthermore, hierarchical regression analysis revealed that, after controlling for age, gender, and job tenure, FWC ($\beta = 0.22$, $p = 0.015$) and ELS ($\beta = -0.22$, $p = 0.018$) were the unique significant predictors of TOI. Notably, WFC and the overall work–life balance did not significantly influence the final predictive model. **Conclusion:** The findings suggest that employee retention is a multi-faceted issue driven by both stressors and protective resources. Occupational health strategies should prioritize holistic support systems by fostering high-quality leadership resources that address primary conflict areas and promote work environments that enhance employees' personal well-being to ensure long-term workforce sustainability.

Keywords: psychosocial stressors, organizational behavior, employee retention, workforce sustainability, workplace well-being

Impact of extremely low frequency electromagnetic fields on the health and workability of workers in high voltage power lines and substations

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Determining the impact of extremely low frequency electromagnetic fields on the health and working ability of workers in high-voltage power grids and substations. The cross-sectional study involves workers from a high-voltage transmission line network and substations, all males aged 25 to 56, classified as electricians, fitters and substation workers. The research methodology includes a specially designed questionnaire for professional exposure to extremely low frequency electromagnetic fields in workers. Respondents spend an average of 6.2 hours a day at a substation or servicing and installing electrical wiring.

All respondents use personal protective equipment during work, and 94% of them said that they have enough personal protective equipment, and 19 respondents had a static electric shock at work. Burns are the most common types of injuries reported in 23%, foreign bodies in the eyes in 21%, and cuts on the hands and fingers were reported in 18% of respondents. Its frequency is dominated by increased blood pressure in 22%, type 2 diabetes mellitus by 4%, as well as musculoskeletal diseases in 2% of respondents. On a monthly basis, the most common symptoms / signs are dry eyes in 11% of respondents, on a weekly basis in 11% there is redness of the skin, difficulty in concentration in 6%, while on a daily basis redness of the skin is registered in 2% of respondents. The frequency of symptoms and signs in the last 12 months is higher in respondents who have an exposure experience of more than 15 years compared to those who have an exposure experience of less than 15 years.

The results indicate the fact that electromagnetic fields with extremely low frequencies affect the health and working ability of workers, as well as the frequency of symptoms / signs on a monthly, weekly and daily basis.

Keywords: extremely low frequency electromagnetic fields, electricians, fitters, substation workers, electrical industry, power lines, substations, biological effects, electromagnetic waves, electric shock, work capacity

Psychosocial Hazards Among Nurses: A Case-Based Analysis of Verbal Abuse and the Role of Psychological Support

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Psychosocial hazards are increasingly recognized as a critical component of occupational health risk among healthcare professionals, particularly nurses exposed to demanding work environments and frequent patient interaction. Verbal abuse constitutes one of the most common forms of workplace violence and is associated with detrimental psychological and occupational outcomes. This abstract presents a case of a 32-year-old nurse employed in a high-volume emergency department, where prolonged waiting times and increased workload contributed to a verbally aggressive incident initiated by a patient. Despite maintaining professional communication and attempting de-escalation, the nurse was subjected to persistent verbal hostility in a public clinical setting. Following the incident, the nurse reported symptoms including emotional distress, reduced concentration, and fatigue. Repeated exposure to similar events contributed to occupational stress and early indicators of Burnout. A multidisciplinary intervention approach was implemented, involving both psychiatric and psychological support. Clinical evaluation identified stress-related symptoms, and short-term therapeutic strategies were introduced to manage anxiety and sleep disturbances. Psychological counseling focused on enhancing coping mechanisms, stress resilience, and emotional regulation. In addition to individual-level interventions, organizational measures such as incident reporting protocols and supportive supervision were applied to address workplace safety and staff well-being. The case highlights the significant impact of verbal abuse as a psychosocial hazard and emphasizes the necessity of early recognition and comprehensive intervention strategies. Integrating mental health support with institutional policies is essential to mitigate adverse outcomes, promote workforce resilience, and maintain high standards of patient care.

Keywords: Psychosocial hazards; nurses; verbal abuse; workplace violence; occupational health

Assessment of Health Status and Work Ability among Electrical Switchgear Operators

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Introduction: The work activities of electrical switchgear operators are associated with exposure to various occupational hazards that may adversely affect their health status and work ability.

Aim: To evaluate the health status and work ability of electrical switchgear operators employed in EVN Macedonia and to identify the most common health risk factors.

Material and methods: This cross-sectional study included 52 electrical switchgear operators employed in EVN Macedonia. Periodic preventive medical examinations were conducted for all participants between May and September 2025, in accordance with the national regulations regarding the type, manner, and scope of occupational health examinations of employees.

Results: The majority of respondents were informed about occupational health risks and reported using personal protective equipment. According to lifestyle data, 76.92% were non-smokers, while 23.07% were smokers. A considerable proportion of respondents (46.15%) had abnormal nutritional status. Arterial hypertension was registered in 57.69% of the respondents, diabetes mellitus in 11.53%, and gastrointestinal diseases in 1.92%. Elevated glycemia levels were detected in 23.07% of the respondents, elevated cholesterol levels in 50%, and elevated triglyceride levels in 26.9%, while both cholesterol and triglyceride levels were simultaneously elevated in 11.53%. Hearing impairment was identified in 61.5% of respondents, while visual impairment was present in 13.46%. Altered ECG findings were recorded in 21.15% of the respondents. Despite the identified health conditions, all workers were assessed as fit to perform their job duties.

Conclusion: The most common health problems among the workers were hyperglycemia, abnormal nutritional status, and elevated blood lipid levels. These findings highlight the importance of regular occupational health monitoring, continuous education, and preventive programs aimed at promoting healthy lifestyle habits among workers.

Keywords: workers, work ability, glycemia, nutritional status, cholesterol, triglycerides

Професионална Астма и Хронична Опструктивна Белодробна Болест Поврзана со Професионална Експозиција

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Вовед: Професионалната астма и хроничната обструктивна белодробна болест претставуваат значајни професионални респираторни заболувања кои се јавуваат како резултат на експозиција на штетни агенси во работната средина. Се проценува дека околу 360 милиони луѓе во светот страдаат од астма, при што приближно една четвртина од астмата кај возрасните е поврзана со работното место. ХОББ е меѓу водечките причини за смртност на глобално ниво и се карактеризира со висок степен на инвалидитет и значителни социоекономски последици.

Целта на трудот е да се елаборираат основните карактеристики на професионалната астма и ХОББ поврзана со професионална експозиција, да се согледаат нивните клинички и дијагностички разлики со цел рано препознавање, како и да се истакнат превентивните мерки и улогата на медицинската сестра во нивната дијагностика, третман и превенција.

Методи: Трудот се базира на дескриптивна анализа на литературата и на преглед на достапните научни и стручни податоци за професионалната астма и ХОББ.

Резултати: Професионалната астма претставува хронично воспалително заболување на дишните патишта со варијабилна и најчесто реверзибилна опструкција, најчесто предизвикана од алергени или иританси на работното место. Наспроти тоа, ХОББ се карактеризира со прогресивна и нереверзибилна опструкција на дишните патишта, која најчесто е поврзана со пушење, но и со долготрајна професионална експозиција на аерополутанти. Дијагностиката се базира на детална работна анамнеза, проценка на професионалната експозиција, функционални белодробни тестови и специфични дијагностички процедури. Превенцијата вклучува примарни, секундарни и терциерни мерки насочени кон контрола на експозицијата, рано откривање и соодветен третман.

Заклучок: Професионалната астма и ХОББ претставуваат најчести професионални респираторни заболувања со значително влијание врз здравјето на работниците и општеството. Раното препознавање на симптомите, соодветната контрола на професионалната експозиција и мултидисциплинарниот пристап, во кој медицинската сестра има важна улога во мониторирањето, едукацијата и превенцијата, се клучни за намалување на товарот од овие заболувања.

Клучни зборови: професионална астма, ХОББ, респираторни заболувања

Ears Condition in Candidates for Motor Vehicle Drivers in the Function of Security

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Aim: Presentation of the status with the ears conditions on candidates for motor vehicle amateur and professional drivers.

Material and Methods: We used the driver's medical record, ambulance evidence, for a period of 1-year 2025. The evaluation was done according to the actual legislation. Evaluation of ear conditions was done with Tonal Audiogram - MAICO ST20 aparate. We did hearing examinations and we analysed them.

Results: Commission for Driving Ability Evaluation has examined 3654 driver candidates, 16 to 79 years old. The tested candidates were 1171 (21 %) females, 2483 (79 %) males. Professional driver candidates reach the number of 975 for and masters driver candidates exactly 2679. From the professional drivers which needed tools for ear condition correction (hearing amplifier) there were only 3 drivers.

From the amateur drivers, 26 candidates needed to carry hearing amplifier correction.

From the candidates with the time period of 1-5 years of driving, 87 were proclaimed amateur drivers and professional drivers were 8.

Conclusion: The most common reasons for evaluation with ear condition correction tools are hypoacusis, affection nervus cochlearis, presbyacusis and trauma acusticum acutum. All of this is very important for traffic safety and stability. The otorhinolaryngological supervision and control are of great importance for a fair and justice selection of the driving candidates.

Keywords: Driving candidates, ears conditions, security.

Health Status and Work Ability of Teaching and Scientific Staff and Collaborators at a Higher Education Institution

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Introduction: The work activities of teaching and scientific staff and collaborators at higher education institutions are associated with exposure to various occupational risks that may affect their health status and work ability.

Aim: To determine the health status and work ability of teaching and scientific staff and collaborators at a higher education institution.

Material and methods: The study included 66 respondents consisting of teaching and scientific staff and collaborators. All participants underwent systematic preventive medical examinations between October and November 2024, in accordance with the national Regulation on the type, manner and scope of health examinations of employees.

Results: The majority of respondents were informed about health risks and reported using prescribed protective measures. According to lifestyle data, 72.7% were non-smokers, while 27.3% were smokers. The largest proportion of respondents belonged to the BMI group 25–30, indicating overweight (48.5%). Arterial hypertension was registered in 25.8% of the respondents, diabetes mellitus in 14.5%, gastrointestinal diseases in 4.8%, and skin changes in 1.6%. Elevated glycemia levels were detected in 28.8% of respondents, elevated cholesterol levels in 57.6%, and elevated triglyceride levels in 13.6%, while simultaneously elevated cholesterol and triglyceride levels were recorded in 10.6%. Hearing impairment was identified in 62.21% of respondents, while visual impairment was present in 54.5%. Altered ECG findings were registered in 18.2% of the respondents. All respondents were assessed as fit for work.

Conclusion: The most common health problems identified among the respondents were elevated cholesterol levels, overweight, and hyperglycemia. The results indicate the need for continuous education, preventive measures, and promotion of healthy lifestyle habits among teaching and scientific staff and collaborators.

Keywords: teaching and scientific staff, work ability, glycemia, BMI, overweight, cholesterol

The Role of Mandatory Occupational Check-ups as a Diagnostic Tool: Early Detection of Acute Myeloid Leukemia in an Asymptomatic Worker - a Case Report

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Introduction: Occupational medicine plays a critical role in safeguarding workers' health through preventive measures, early detection of diseases, and monitoring work ability in relation to occupational hazards. In North Macedonia, preventive health examinations are mandatory for employees, as regulated by national laws. While these examinations are primarily designed to monitor work ability and possible health effects of exposure to occupational hazards, they also serve as a critical diagnostic bridge for detecting early health abnormalities and systemic diseases. Pancytopenia - the simultaneous reduction in red blood cells, white blood cells, and platelets - is a significant hematological finding that can indicate underlying bone marrow disorders, such as acute leukemia. Early detection of such conditions, even in the absence of obvious symptoms, is crucial for prompt diagnosis and treatment.

Case Presentation: A 46-year-old female worker, working as a cleaner in a pharmaceutical company, comes in for a routine occupational health check-up in February 2026, with no significant previous medical history. As part of the standard assessment, a physical examination and laboratory tests including a complete blood count were performed. The laboratory findings revealed suspicion for a possible hematologic disorder, indicating pancytopenia, with significant leukopenia, anemia, and thrombocytopenia. Upon physical examination, spontaneous ecchymoses, which the patient had previously overlooked, were identified. Due to these findings, the patient was urgently referred to a hematologist, where further tests, including coagulation tests, biochemical analyses and bone marrow biopsy, confirmed the diagnosis of acute myeloid leukemia (AML).

Conclusion: This case highlights the indispensable role of routine occupational health assessments in the early detection of life-threatening malignancies. By identifying hematological abnormalities in the pre-symptomatic phase, occupational medicine facilitates timely intervention and improves patient prognosis. The systematic application of national health regulations thus provides a vital "safety net" for public health beyond the scope of workplace safety.

Keywords: occupational medicine, workability assessment, pancytopenia, hematological malignancies, diagnostic bridge

Prevalence on burnout syndrome among healthcare professionals in North Macedonia

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Introduction: Burnout syndrome is a state of emotional exhaustion resulting from long exposure to chronic workplace stress. Due to the demanding nature of their work, responsibility, and continuous interaction with patients, healthcare professionals constitute one of the primary occupational groups at an increased risk of developing this syndrome. **Objective:** The study aimed to assess the prevalence of burnout syndrome among healthcare professionals in North Macedonia. **Design:** A cross-sectional analytical study. **Setting and participants:** The study sample included doctors, nurses, dentists, lab technicians, and physiotherapists employed in healthcare institutions in Bitola, Ohrid and Kumanovo.

Materials and Methods: This study included a sample of 117 healthcare professionals. The group consisted of 79.5% women and 20.5% men. Regarding employment status, 94.9% of participants were employed, while 5.1% were unemployed. In terms of educational attainment, 82.9% held a university degree, 6.8% had secondary education, 9.4% held a master's degree, and 0.9% held a doctoral degree. Night shifts were performed by 37.6% of the respondents. Mean age of was 36.28 years.

Results: The distribution of burnout levels among the participants revealed that the majority experienced low to moderate levels of burnout. Among those working night shifts (n=43), 51.16% reported low levels (1.0–1.99), 39.53% reported low-to-moderate levels (2.0–2.49), and 9.30% exhibited moderate levels (2.5–2.99) of burnout. In comparison, of the respondents working day shifts (n=66), 56.06% reported low levels, 42.42% reported low-to-moderate levels, and 1.52% showed moderate levels. Notably, no participants in either group scored in the moderate-to-high (3.0–3.49) or high (3.5–4.0) burnout ranges.

Conclusion: Healthcare professionals mostly experienced low to moderate burnout. Factors such as shift and night work, plus emotional engagement, may contribute to its development. Results highlight the need for organizational interventions and preventive strategies.

Keywords: Burnout syndrome, healthcare professionals, occupational stress, night shifts, psychosomatic disorders

The Persistent Phantom: Tracking Subclinical lead toxicity in a post-industrial landscape

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Introduction: Current systemic exposure is driven by the persistence of anthropogenic "hotspots" and the resuspension of technogenic dust, which facilitate a state of chronic, low-level intoxication within the general population.

Methodology: A retrospective analysis was conducted utilizing longitudinal data from the Institute of Public Health and the Institute of Occupational Health. The study monitored lead levels through atomic absorption spectrometry, supplemented by an evaluation of specific biomarkers for renal and hematological impairment.

Clinical Presentation: Data analysis revealed that while the 2022 implementation of EU-aligned safety protocols successfully reduced overt clinical saturnism in the mining sector to under 5%, subclinical manifestations remain pervasive. In the Veles, persistent soil contamination in 2023 was directly linked to >12% prevalence of microcytic erythrocytic alterations and pathognomonic basophilic stippling in pediatric population Clinically, the chronic burden during this period manifested primarily through a rise in secondary hypertension and early-stage tubulointerstitial nephropathy among adults > 50. These patients frequently presented with non-specific gastrointestinal distress, including the classic *colica saturnina*, and a notable incidence of "saturnine gout" due to impaired urate clearance. Furthermore, subclinical radial nerve weakness and executive cognitive deficits were identified in cohorts residing near legacy slag heaps, even when BLL remained below traditional toxic thresholds.

Conclusion: The 2020–2024 observations confirm that North Macedonia is navigating a "silent" epidemic of low-level lead exposure. The transition from obvious poisoning to subtle, multi-organ dysfunction necessitates an urgent revision of national biological limit values and a finalized strategy for soil remediation to prevent irreversible cardiovascular and neurological impairment.

Keywords: Chronic Saturnism, Secondary Hypertension, secondary hypertension tubulointerstitial nephropathy

Assessment of Cardiovascular Risk Among Police Officers Using the Score 2 Mode

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Prevention of cardiovascular diseases consists of promoting healthy lifestyles and influencing risk factors. In June 2021, the European Society of Cardiology (ECS) published SCORE 2 as a new model for assessing cardiovascular risk in healthy individuals aged 40-69, taking into account gender, age, cigarette consumption, systolic blood pressure, total and HDL cholesterol. European countries are classified into 4 risky geographical regions according to the mortality rate from cardiovascular diseases. Serbia belongs to a geographical region with a very high risk. The aim of the work was to assess the occurrence of fatal and non-fatal cardiovascular events in the next ten years among police officers employed in the PU for the city of Belgrade. The SCORE 2 algorithm was used for risk assessment, and the assessment was made for all police officers who met the criteria required by the model, and who were examined as part of the periodic review of the PU for the city of Belgrade at the Institute for Health Protection of MUP Workers in the period from 19 June 2023 to July 18, 2023. In the mentioned period, 856 workers were examined, and 225 of them met the criteria required by the SCORE 2 algorithms. The average age of the respondents was 45.7 years. In the largest number of respondents, 67.8%, a moderate cardiovascular risk of 1-5% was calculated. Low risk was calculated for 12.9%, high risk for 18.7%, and very high risk for 0.9% of respondents. Taking into account that the examined group is relatively young, and that a fifth of the respondents belong to a high and very high risk for the occurrence of cardiovascular disease, we should work intensively on the prevention of risk factors in general medicine offices and during periodic examinations of employees.

Keywords: cardiovascular diseases, risk factors, police officers, SCORE 2

Silent Crisis in Healthcare: High Rates of Depression and Anxiety Among Hospital Workers in Mexico

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Introduction: Mental health disorders among healthcare workers represent a growing global concern, particularly after the COVID-19 pandemic. Occupational stressors and psychosocial risks may significantly impact their well-being and performance.

Objective: To determine the prevalence of depression and anxiety among healthcare workers in a second-level hospital in Mexico and to identify associated occupational factors.

Methods: A cross-sectional study was conducted in 2025 among 1,771 healthcare workers at a second-level gyneco-pediatric hospital. Mental health screening was performed using validated tools, including the Beck Depression Inventory and Beck Anxiety Inventory, as part of a workplace health program. Additional data on occupational and psychosocial factors were collected through standardized questionnaires.

Results: A total of 765 workers received individual psychological assessment. Among them, 55% presented depressive disorders and 24% anxiety disorders. Women showed a higher prevalence of depression, while substance use was more frequent in men. Only 3% of participants completed the full therapeutic intervention, indicating low adherence to mental health care. Identified risk factors included high workload, long commuting times, and organizational factors such as leadership and workplace relationships.

Conclusions: There is a high burden of depression and anxiety among healthcare workers in this setting, with significant barriers to treatment adherence. These findings highlight the need for strengthened workplace mental health strategies, early detection programs, and organizational interventions to reduce psychosocial risk factors and improve workers' well-being.

Keywords: Mental health; Healthcare workers; Depression; Anxiety; Occupational health; Mexico

Diseases of the Musculoskeletal System Related to Occupational Exposure Author(s):

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Вовед: Мускулоскелетните нарушувања поврзани со работата претставуваат значаен јавно-здравствен проблем со висока застапеност кај работната популација и сериозно влијание врз работната способност и квалитетот на животот. Тие опфаќаат воспалителни и дегенеративни состојби на мускулите, тетивите, зглобовите, лигаментите и периферните нерви, при што најчести се тендинитис, епикондилитис, синдром на карпален тунел и лумбален синдром.

Цел: Да се прикаже значењето на професионалната експозиција како фактор во настанувањето на мускулоскелетните нарушувања, како и улогата на превентивните мерки и превентивните прегледи во нивната рана детекција и контрола.

Материјал и метод: Истражувањето е направено со преглед на релевантна литература и теоретски податоци за мускулоскелетните нарушувања поврзани со работата, со посебен осврт на ризик факторите, клиничката слика, превенцијата и улогата на здравствените работници.

Резултати: Резултатите укажуваат дека мускулоскелетните нарушувања имаат мултикаузална етиологија, при што физичките фактори (повторувачки движења, примена на сила, нефизиолошка положба), организациските фактори (високо работно оптоварување, временски притисок) и индивидуалните карактеристики значајно придонесуваат за нивниот развој. Клиничката слика најчесто се манифестира со болка, ограничени движења и вкочанетост, при што болката е доминантен симптом. Раната детекција со спроведување на редовните превентивни медицински прегледи и проценка на ризик факторите овозможува навремена интервенција и намалување на последиците.

Заклучок: Мускулоскелетните нарушувања поврзани со работата претставуваат комплексен здравствен проблем кој бара интегриран пристап. Примената на ергономски принципи, адаптацијата на работните услови и редовните здравствени превентивни прегледи се клучни за нивна превенција. Медицинската сестра има значајна улога во раната идентификација, едукација и контрола на ризиците, што придонесува за намалување на здравствените, социјалните и економските последици.

Keywords: мускулоскелетни нарушувања, ергономија, превентивни прегледи

Ноќната работа и метаболните параметри: независна поврзаност со вкупниот холестерол, но не и со TyG индексот по прилагодување

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Вовед: Ноќната работа е поврзана со зголемен кардиометаболен ризик, но не е јасно кои метаболни параметри се независно засегнати и колкава е улогата на конфаундерите.

Методи: Спроведена е пресечна опсервациска студија кај 108 испитаници (58 работници во обезбедување, со ноќна работа и 50 канцелариски работници без ноќна работа). Анализирани беа гликемија на гладно, триглицериди, вкупен холестерол и триглицерид-гликозен (TyG) индекс. Групните разлики беа проценети со t-тест или Mann–Whitney U тест, според распределбата на податоците, и χ^2 тест за категориjsки варијабли. Мултиваријантни линеарни регресии беа прилагодени за возраст, Индекс на телесна маса, пол, пушење, алкохол, семејна историја на дијабетес и исхрана во ноќна смена. Дополнително, беше спроведена стратифицирана анализа кај мажи поради нерамномерна распределба по пол.

Резултати: Во неприлагодени анализи, ноќната работа беше поврзана со повисоки вредности на вкупен холестерол ($p = 0.036$), триглицериди ($p = 0.004$), гликемија ($p = 0.048$) и TyG индекс ($p < 0.001$). По прилагодување за конфаундери, само вкупниот холестерол остана независно поврзан со ноќната работа ($B = 0.641$, $p = 0.014$). Во машката подгрупа, поврзаноста со TyG индексот не беше статистички значајна ($p = 0.201$), додека ефектот врз холестеролот остана изразен ($B = 0.811$, $p = 0.003$). Не беше утврден доза-одговор ефект според години ноќна работа (сите $p > 0.05$). Ниту исхраната во ноќна смена, ниту бројот на оброци не беа независни предиктори на метаболните параметри.

Заклучок: Ноќната работа е независно поврзана со повисок вкупен холестерол, што укажува на селективен липиден ефект, додека поврзаноста со TyG индексот не останува значајна по прилагодување за конфаундери. Овие резултати ја нагласуваат потребата за рана детекција и интервенции насочени кон липидниот профил кај работници со ноќна работа.

Клучни зборови: Ноќна работа, холестерол, триглицерид-гликозен (TyG) индекс, кардиометаболен ризик

Превентивни прегледи и здравје при работа кај пожарникарите

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Вовед: Пожарникарите се изложени на екстремни температури, чад, токсични гасови, значителен физички напор и психолошки стрес. Овие фактори ја зголемуваат веројатноста за хронични заболувања, особено кардиоваскуларни, и може да влијаат врз работната способност. Редовните систематски прегледи се клучни за рана детекција на ризик-фактори и превенција на професионален морбидитет. **Цел:** Да се анализира редовноста и опфатот на систематските прегледи кај пожарникарите, нивното задоволство од здравствените контроли, како и присуството на хронични заболувања и работни ограничувања. **Материјал и методи:** Пресечна студија е спроведена кај 53 пожарникари со просечна возраст од 45.4 години (опсег 31–64 години). Податоците беа прибрани со структуриран прашалник кој опфаќаше редовност и периодичност на систематските прегледи, видот на извршените испитувања, преглед пред вработување, присуство на хронична болест, работни ограничувања и степен на задоволство. Анализата е извршена со дескриптивна статистика. **Резултати:** 75% од испитаниците редовно се прегледуваат, додека 25% тоа го прават нередовно. Повеќето (57%) се прегледуваат еднаш годишно, 9% на секои две години или повеќе, а 34% поретко. Од нив, 53% се задоволни од прегледите, 28% делумно задоволни, а 19% сметаат дека прегледите не ги опфаќаат сите потребни аспекти. Основни клинички прегледи имале 85%, лабораториски испитувања 70%, специјалистички 30–35%, а функционални или дополнителни тестови 15–20%. Преглед пред вработување имале 81%, а 19% не биле опфатени. Работно ограничување пријавиле 11%, додека хронична болест имале 28% од испитаниците. **Заклучок:** Потребно е стандардизирање и унапредување на систематските прегледи преку задолжителни, периодични и сеопфатни здравствени проценки, со проширен дијагностички опфат. Дополнително, се препорачува изготвување на посебен Правилник за здравствена проценка и следење на пожарникарите, со цел зачувување на работната способност, превенција на професионален морбидитет и подобрување на безбедноста при интервенции.

Keywords: пожарникари; систематски прегледи; професионално здравје; хронични заболувања; работна способност; превенција.

Климатски промени, ментално здравје и алергии кај работниците на отворено: резултати од прегледот на литературата

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Вовед: Климатските промени сè повеќе се препознаваат како главна детерминанта на здравјето при работа, особено кај работниците на отворено кои се изложени на екстремни температури, загадување на воздухот и аероалергени. Сè повеќе докази ја поврзуваат професионалната изложеност на климатските промени со негативните последици по менталното и на физичкото здравје.

Цели: Да се даде приказ на научната литература за поврзаноста помеѓу изложеноста на климатските промени, последиците по менталното здравје и алергиските или респираторните тегоби кај работниците на отворено во Европа.

Методи: Спроведено е пребарување на литературата во базата PubMed/MEDLINE и дополнителни извори според упатствата на PRISMA 2020. Вклучени се студиите во кои што: иследувани се возрасни работници на отворено, проценувана е изложеноста на климатските промени (на пр. топлина, екстремно временски настани, загадување на воздухот, полен) и анализирани се ефектите на менталното здравје и/или алергиските или респираторните тегоби. Во анализата се вклучени и квантитативни студии и систематски прегледи на литературата.

Резултати: Девет студии ги исполнија критериумите за вклучување. Квантитативните податоци покажуваат поврзаност помеѓу изложеноста на топлина и негативните ефекти на менталното здравје (стрес, анксиозност и согорување кај работниците на отворено, особено во земјоделството и градежништвото). Квантитативните податоци укажуваат и на асоцијацијата помеѓу изложеноста на топлотните бранови, загадувањето на воздухот и поленот со респираторните и алергиските симптоми кај работниците на отворено. Но, ниту една студија истовремено не ги проучува ефектите на менталното здравје и алергиските симптоми во иста аналитичка рамка. Европските податоци се фрагментирани и ретко се фокусираат на меѓунационални споредби.

Заклучоци: Актуелните квантитативни студии упатуваат на ефектите на климатските промени врз менталното здравје, како и врз алергиските и респираторните тегоби кај работниците на отворено. Постои критичен јаз во интегрираните, европски истражувања што го испитуваат комбинираниот ефект врз менталното здравје и алергиските тегоби како последица на изложеноста поврзана со климатските промени на работното место.

Keywords: медицина на трудот, безбедност при работа, еко-анксиозност, изложеност на топлина, професионален ризик

The Relationship between Distress, Food and Dietary Habits: A Review

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According to scientific results regarding the association between distress, diet, and eating habits, the risk of developing obesity was discovered. This review presents a conceptual framework for understanding the relationship between diet and eating habits with an emphasis on health and distress. Distress increases the desire for sweet foods and saturated fatty acids, hedonism, which is associated with unhealthy eating habits and excess weight. These patterns are more pronounced in women than in men. A good choice of nutrients, vitamin C and E, zinc, selenium, carotenoids, polyphenols, and flavonoids, reduced stress. Magnesium is rich in: leafy vegetables, oranges, kiwi, strawberries, grapefruit, meat, dairy products, soybeans, pumpkin seeds, sunflower seeds, wheat germ, and nuts. When a person is exposed to stress, yogurt with fruit is a good choice, while it is best to avoid chips and carbonated and colored juices. Alcohol, caffeine, and sweets could adversely affect hydration and metabolism. Proper hydration with enough water, fresh juices, and unsweetened herbal tea helps a person in distress. It is recommended to establish good eating habits that reduce distress. Eating meals every 3-5 hours in order and a daily breakfast to regulate blood sugar levels. Success lies in stress management techniques, based on positive living habits and food choices.

Keywords: distress, diet, eating habit, unhealthy eating habits, good choice of nutrients, management of distress

Night Shift as a Risk Factor: Effects on Physical and Mental Health Among Emergency Medical Service Personnel

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Introduction: Night shift represents a significant occupational risk factor, especially among healthcare professionals engaged in emergency medical services, where working conditions are characterized by high stress, fast pace, and substantial disruption of biological rhythms. Disruption of the daily biological rhythm affects sleep quality, metabolism, and cardiac function, and may lead to various health problems.

Methodology: The study included 40 healthcare workers employed in emergency medical services, aged between 30 and 60 years, exposed to shift work with night shifts. Participants varied in terms of years of work experience and number of night shifts per month. Parameters related to physical and mental health were analyzed, including sleep quality, fatigue, stress level, symptoms of disrupted biological rhythm, and presence of chronic diseases.

Results: The results obtained from the 40 participants show that 22.5% have arterial hypertension, 15% have hyperglycemia, 7.5% report palpitations, and 10% present psychological disorders. These findings indicate a significant association between night shift work and increased prevalence of cardiovascular, metabolic, and psychological disorders. Additionally, chronic stress and poor sleep quality are key contributing factors in the development of occupational burnout syndrome, leading to reduced work efficiency and functional capacity.

Conclusion: Night shift work represents a significant risk factor for the health of medical personnel in emergency medical services. Systemic measures are required, including optimization of shift schedules, regular health screening, and psychological support, in order to reduce adverse effects and improve quality of life and work efficiency.

Keywords: night shift work, emergency medical services, stress, fatigue, insomnia, hypertension, burnout syndrome, cardiovascular health

Prediabetes among Serbian railway workers

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Introduction: Prediabetes is a reversible metabolic condition where glycemic values are above normal but below the threshold for diabetes mellitus. The cause is either pancreatic β cell dysfunction or insulin resistance in peripheral tissues. People with prediabetes are at greater risk for diabetes mellitus, cardiovascular, cerebrovascular disease and have higher all cause mortality. Risk factors for developing prediabetes are overweight, positive family history of diabetes, inactivity, and age over 45. Railway workers have 1.5 to 2 times higher risk for prediabetes than the general population due to psychosocial factors at work. The prevalence of prediabetes among railway workers worldwide varies from 12 to 20%.

Aim: To assess the prevalence of prediabetes among railway workers in Serbia. We analysed whether there was a difference between railway occupation category and mean fasting blood glucose levels (FBG).

Methods: The research was designed as a cross-sectional study. The target population were railway workers who accessed a periodic fitness examination at the Institute for Healthcare of Workers of "Serbian Railways" in the period from 18 February to 18 March 2026. The diagnostic criterion was the value of fasting blood glucose according to WHO criteria. Data were obtained from laboratory testing, anamnesis, anthropometric measurements and physical examination during the periodic examination. SPSS 25 was used to analyse the data.

In this research 25,19 % of railway workers had FBG above normal. There was a significant difference in mean FBG between certain categories of occupation.

Conclusion: This study revealed that the prevalence of prediabetes among Serbian railway workers is significant. Further research is needed in order to generalize results to entire population of Serbian railway workers. By identifying workers with prediabetes, measures can be taken to prevent the development of disease and maintain the long-term fitness for work.

Keywords: prediabetes, railway workers, fasting glucose levels, fitness for work

Health Status and Work Ability of Teaching and Scientific Staff and Collaborators at a Higher Education Institution

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Introduction: The work activities of teaching and scientific staff and collaborators at higher education institutions are associated with exposure to various occupational risks that may affect their health status and work ability. **Aim:** To determine the health status and work ability of teaching and scientific staff and collaborators at a higher education institution. **Material and methods:** The study included 66 respondents consisting of teaching and scientific staff and collaborators. All participants underwent systematic preventive medical examinations between October and November 2024, in accordance with the national Regulation on the type, manner and scope of health examinations of employees. **Results:** The majority of respondents were informed about health risks and reported using prescribed protective measures. According to lifestyle data, 72.7% were non-smokers, while 27.3% were smokers. The largest proportion of respondents belonged to the BMI group 25–30, indicating overweight (48.5%). Arterial hypertension was registered in 25.8% of the respondents, diabetes mellitus in 14.5%, gastrointestinal diseases in 4.8%, and skin changes in 1.6%. Elevated glycemia levels were detected in 28.8% of respondents, elevated cholesterol levels in 57.6%, and elevated triglyceride levels in 13.6%, while simultaneously elevated cholesterol and triglyceride levels were recorded in 10.6%. Hearing impairment was identified in 62.21% of respondents, while visual impairment was present in 54.5%. Altered ECG findings were registered in 18.2% of the respondents. All respondents were assessed as fit for work. **Conclusion:** The most common health problems identified among the respondents were elevated cholesterol levels, overweight, and hyperglycemia. The results indicate the need for continuous education, preventive measures, and promotion of healthy lifestyle habits among teaching and scientific staff and collaborators.

Keywords: teaching and scientific staff, work ability, glycemia, BMI, overweight, cholesterol

Occupational Risk Exposures and Adverse Health Findings Among Farmers

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Introduction: Pesticides are widely used in the agricultural sector to increase production by cutting costs and improving product quality. This study aimed to identify the health symptoms and physical assessment findings affecting farmers from their repeated occupational exposure to pesticides. **Methods:** This research study used a cross-sectional design, and samples were drawn based on a multistage sampling of 387 agricultural workers. Survey questionnaires were given to the respondents, and a physical assessment was conducted by medical doctors and trained registered nurses. **Results:** The farmers used pesticides in their farms with an average of 2.3 days per week (SD: ± 2.13). The mean total spraying time was 3.07 hours (SD: ± 14.76) per day. The average amount of pesticide used in an application was 1.33 L per application (SD: ± 6.53). Sixty-three percent (63%) had spills while spraying, and 47% reported having spilled pesticides while mixing. Farmers were assessed and found to have experienced symptoms and exhibited physical assessment findings surrounding the following body systems: general, EENT, neurologic, gastrointestinal, respiratory, cardiovascular, and integumentary systems. Abnormalities in laboratory parameters were also observed among the respondents. The mini-mental state examination was done to test if the respondents showed signs of cognitive impairment. The results showed that most respondents (93.95%) had normal cognitive function, while 6.05% of respondents had some level of cognitive impairment. Associations were also tested using Phi Coefficient, and certain pesticide exposure variables were associated with farmers' physical findings and symptoms experienced by farmers. **Conclusion:** This study translates pesticide's health impact by identifying the common symptoms experienced by farmers and concerning physical assessment findings.

Keywords: Farmers, agricultural workers, occupational health and safety, pesticides

A Review of the Workability and Social Burden Generated by Primary Open-angle Glaucoma (POAG) in Workers

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Цел: Цел и интерес на истражувањето ни беа да ги согледаме социјалниот товар и влијанието на слабовидноста врз работоспособноста кај работници заболени од ПОАГ. **Материјал и методи:** Трудот е дизајниран како обсервациона студија со квантитативен аналитички пристап на реално добиени податоци во амбулантски услови при офталмолошки и периодични систематски прегледи. Во иследувањето се вклучени 112 работници со ПОАГ, кај кои дијагнозата и клиничките стадиуми се определени спрема ICD-10 (H40.1) во согласност со класификацијата на European Glaucoma Society. Статистичката обработка на податоците е направена со SPSS software v.22.0.

Резултати: 47.3% од заболените се во иницијален, 34.8% во умерен, а 17.9% во напреднат клинички стадиум, имаат просечна возраст 56.2±5.15 год., 53.5% се од женски пол, 18.7% имаат фамилијарна офталмолошка анамнеза, а 14.3% не се информирани со суштината за болеста. Намалената видна острина беше значајно асоцирана со намалена работна способност и продуктивност, заради што 6.25% од заболените претежно во напреднат клинички стадиум биле на боледување, 37.5% не ги исполнуваат целосно, 20.5% имаат потреба од помош при извршување на работните задачи, а 10.7% заради неквалитетно исполнување на работните задачи се преместени на пониски работни позиции. Заради намалената работна способност 20.5% од заболените со острина на видот пониска од 0.3 примаат понизок доход или се преместени на пониско платени работни места. Кај 35.7% од заболените, скапите лекови и ниските приходи предизвикуваат социјално-економско индивидуално и фамилијарно оптеретување, заради што 24.1% од нив се лекувани неадекватно со нередовно примање терапија или користеле алтернативни поевтини антиглаукоматозни лекови.

Заклучок: Сочувувањето на работната способност е во инверзна, а зголемувањето на социјалниот товар, во пропорционална корелација со напредувањето на ПОАГ. Спроведувањето на периодични систематски прегледи и скрининг програми за рано откривање на ПОАГ, редовни офталмолошки контроли и адекватна терапија се од суштинско значење за одржување на работната способност.

Keywords: примарен глауком со отворен агол (ПОАГ), работна способност, социјален товар, скрининг програми

Health-related quality of life (HRQL) and work ability in visually impaired people

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Цел: Целта на истражувањето беше да се процени квалитетот на живот поврзан со здравјето (HRQL) кај лица со слабовидост и да се анализира неговата поврзаност со работната способност.

Материјал и методи: Спроведена беше студија на пресек во која беа вклучени 600 испитаници. Испитуваната група се состоеше од 450 лица со слабовидост предизвикана од глауком, дијабетична ретинопатија и рефракциони аномалии со видна острина од 0.05-0.3, додека контролната група опфати 150 лица со сочувана видна острина поголема од 0.5. Квалитетот на живот поврзан со здравјето (Health related quality of life -HRQL) беше проценет со стандардизиран мерен инструмент EuroQol-5 Dimension self-classifier (EQ-5D), самопроцената на моменталната здравствената состојба со визулена аналогна скала EQ-VAS, додека работната способност беше испитувана со Work Ability Index (WAI).

Резултати: Испитаниците со слабовидост покажаа намалени вредности на HRQL во споредба со контролната група. Највисоки вредности на HRQL беа утврдени кај испитаниците со глауком, додека најниски кај лицата со дијабетична ретинопатија. Самопроцената на здравствената состојба на EQ-VAS скалата кај слабовидните лица во просек изнесуваше околу 60%, при што најдобра самопроцена на здравјето имаа заболените лица со рефракциоони аномалии, а најлоша, заболените од дијабетична ретинопатија. Анализата покажа дека пониските вредности на HRQL и EQ VAS се поврзани со пониски вредности на индексот на работна способност и со поголеми ограничувања во секојдневните активности.

Заклучок: Слабовидоста значително влијае врз квалитетот на живот поврзан со здравјето (HRQL) и врз функционалната способност на лицата со оштетен вид. Проценката на HRQL може да биде важен индикатор за здравствената состојба и за рана идентификација на лица со ризик од намалена работна способност.

Keywords: Health-related quality of life (HRQL), EQ-VAS, слабовидост, Work Ability Index, квалитет на живот

Проценка на работната способност кај слабовидни лица со користење на Work Ability Index

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Цел: Целта на истражувањето беше да се процени работната способност кај лица со слабовидност со користење на индексот на работна способност (Work Ability Index – WAI) и да се анализира влијанието на социо-демографските и професионалните карактеристики врз работната способност.

Материјал и методи: Истражувањето беше спроведено како студија на пресек во која беа вклучени 600 испитаници. Испитуваната група се состоеше од 450 лица со слабовидност предизвикана од глауком, дијабетична ретинопатија и рефракциони аномалии со видна острина од 0.05-0.3, додека контролната група опфати 150 лица со видна острина поголема од 0.5. Работната способност беше проценета со стандардизираниот инструмент Work Ability Index (WAI).

Резултати: Просечната вредност на индексот на работна способност кај лицата со слабовидност изнесуваше 30.1 ± 4.1 , што се наоѓа на долната граница на категоријата добра работна способност. Кај 35.8% од испитаниците беше утврдена лоша, кај 58.7% добра, а кај 5.5% многу добра работна способност. Во споредба со испитаниците со слабовидност, контролната група имаше повисока просечна вредност на WAI (34.7 ± 3.4), што представува горна граница на добра работна способност, со статистички сигнификантна разлика на WAI во прилог на подобра работна способност во однос на заболените лица. Анализата покажа варијации на индексот на работна способност кај слабовидните лица во зависност од полот, возраста, образовниот статус и видот на професијата, при што работната способност има тенденција на намалување со возраста и со зголемување на здравствените ограничувања.

Заклучок: Работната способност кај лицата со слабовидност е условена од повеќе фактори и не зависи само од степенот на оштетување на видот. Покрај здравствената состојба, значајна улога имаат социо-демографските карактеристики, професионалната подготовка и барањата на работните активности.

Keywords: Work Ability Index, работна способност, слабовидност, работна средина, хронични очни заболувања

Occupational Trauma after a Fall from a Height - A Case Report

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Вовед: Падот од висина претставува значаен професионален ризик и една од водечките причини за тешки повреди и смртни случаи на работното место, особено кај работници ангажирани во електродистрибутивни дејности. Според податоците на Бирото за трудова статистика (Bureau of Labor Statistics-BLS), стапката на фатални повреди кај електротехничарите е повисока од просекот за сите занимања, при што падот од висина е втора најчеста причина по електричен удар. Освен акутните повреди, можни се и трајни невролошки последици кои значително ја намалуваат работната способност.

Цел: Да се прикаже случај на работник со трајна периферна пареза на n. facialis по повреда при работа - пад од висина и да се направи оценка на работната способност.

Приказ на случај: Маж на возраст од 58 год., електроинженер со 16 год. работен стаж, паднал од 1,5m висина при извршување на работните задачи. Дијагностицирана е фрактура на десната темпорална коска со последователна периферна пареза на n. facialis dex. Клинички се манифестира со асиметрија на лицето, неможност за целосно затворање на десното око, синкинезии и контрактури на лицевата мускулатура, како и сензонеурална редукција на слухот. И покрај физикалната терапија, две години по повредата перзистираат трајни невролошки дефицити. Присутни се и коморбидитети (артериска хипертензија и хипергликемија). Пациентот е оценет како способен за работа со ограничувања, со препорака да не работи на висина и во неповолни микроклиматски услови, како и да се изврши промена на работното место.

Заклучок: Случајот потврдува дека и пад од релативно мала висина може да доведе до трајни функционални последици и ја нагласува потребата од строга примена на мерките за безбедност и мултидисциплинарен пристап во рехабилитацијата и оценката на работната способност.

Клучни зборови: пад од висина; повреда при работа; работна способност.

Distribution of Breast Cancer According to Age, Occupation, and Histopathological Type: A Retrospective Study

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Background: Breast cancer is the most common malignancy among women worldwide and a major public health concern. Its etiology is multifactorial; in addition to genetic and hormonal factors, occupational exposure, lifestyle, and socioeconomic conditions may influence disease risk. **Materials and methods:** We conducted a retrospective, observational single-center study at the Department for Thoracic and Vascular Surgery, University Clinical Center “Mother Teresa” in Skopje, North Macedonia. The study included a total of 100 patients (aged 18-65 years) surgically treated for breast cancer between January 1 and December 1, 2025.

Demographic characteristics, occupation, and histopathological tumor type were analyzed.

Patients were grouped by occupation: unemployed, administrative workers, manual labor/physical workers, industrial workers, healthcare workers, and agricultural workers.

Patients were stratified into three age groups: 18–35 years (young patients), 36–50 years (middle-aged), and 51–65 years (postmenopausal). **Results:** Breast cancer was most frequent in patients aged 51–65 years (50%), and least common in those aged 18–35 years (4%).

Unemployed patients comprised the largest group (33%), followed by administrative (21%) and physical workers/manual labor (19%). Industrial workers accounted for 15%. The lowest number of cases was observed among healthcare workers and agricultural workers. The most common histopathological tumor type was invasive breast carcinoma of no special type (IBC-NST). No clear occupational predisposition was identified; however, a trend toward higher prevalence was observed among patients with sedentary occupations. Conclusion: Breast cancer predominantly affects older patients, with IBC-NST as the most common subtype. Occupational distribution suggests a potential influence of lifestyle and socioeconomic factors. Further multicenter studies are warranted.

Keywords: breast cancer; occupational factors; demographic characteristics; retrospective analysis; single-center

The Role of Healthcare Facility Visits as a Source of COVID-19 Transmission in Kosovo

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Introduction: During the early phases of the COVID-19 pandemic, healthcare facilities worldwide became potential sites of SARS-CoV-2 transmission due to high patient flow, limited infection control capacity, and evolving clinical protocols. Kosovo faced similar challenges. This study examines the extent to which healthcare facility visits contributed to COVID-19 exposure and transmission among patients during 2020–2021.

Aim: The aim of this paper is to analyze the epidemiological, demographic, and clinical characteristics of COVID-19 patients in Kosovo during the period 2020–2021, with a particular focus on assessing individual vulnerability through the ALAMA COVID-19 Medical Risk Score. The study seeks to identify how age, gender, comorbidities, and healthcare-related exposure influence the severity and risk of COVID-19 infection in the Kosovan population.

Methods: A cross-sectional study was conducted including 200 participants: 150 COVID-19 positive individuals confirmed by RT-PCR and 50 hospitalized patients treated at the Clinical Center of Pristina. Data were collected using the WHO standard COVID-19 epidemiological questionnaire. Variables assessed included recent healthcare facility visits (within 14 days), demographic characteristics, comorbidities, and symptom onset. Statistical analysis used Chi-square tests and non-parametric methods, with significance set at $p < 0.05$.

Results: A notable proportion of COVID-19 cases reported visiting a healthcare institution in the 14 days prior to diagnosis. These individuals showed higher frequency of symptomatic presentation—including fever, fatigue, body aches, and headache—compared with those tested due to contact exposure. Healthcare workers also demonstrated increased vulnerability due to occupational exposure. The ALAMA COVID-19 risk assessment revealed that patients visiting healthcare facilities tended to belong to higher-risk categories, often with underlying comorbidities that necessitated more frequent medical care.

Conclusion: Healthcare facility visits played a measurable role in COVID-19 transmission in Kosovo. Strengthening infection prevention measures, reducing unnecessary in-person visits, and improving triage.

Keywords: COVID-19; healthcare-associated infection; healthcare facilities; transmission risk; ALAMA score; Kosovo

The Republic of North Macedonia and the Strategic Eminence of Skopje

The Republic of North Macedonia is a sovereign state located in Southeast Europe, occupying an important position on the Balkan Peninsula. It is characterized by a rich historical and cultural development shaped by a blend of diverse civilizational influences and varied natural landscapes. Its capital, Skopje, serves as the main administrative, cultural, and educational center of the country, and represents an important hub for regional connectivity and socio-economic development.

Historical Stratigraphy and Cultural Heritage

Skopje possesses a multifaceted historical narrative rooted in antiquity, exemplified by the proximity of the Roman archaeological site of Scupi. Over the centuries, the city's urban morphology and cultural identity have been meticulously sculpted by Byzantine and Ottoman legacies. This enduring heritage is most tangibly preserved within the **Old Bazaar**—one of the most significant cultural-historical complexes in the Balkans—where traditional craftsmanship and ancestral customs seamlessly converge with contemporary urbanity.

A preeminent landmark of the cityscape is the **Skopje Fortress (Kale)**. Overlooking the central urban core, it stands as a perennial testament to the city's strategic and defensive exigency throughout the epochs. Presently, the Fortress functions as a paramount cultural-historical site and a venue for prestigious intellectual and artistic discourse, bridging historical continuity with modern societal dynamics.

Ecological Assets and Recreational Paradigms

In the city's immediate periphery lies the **Matka Canyon**, a singular natural reserve of exceptional biodiversity and ecological significance. Matka is distinguished by its hydrographic features, speleological formations, and medieval monastic architecture, constituting a rare symbiosis of natural aesthetics, spiritual heritage, and serenity. It remains a critical site for specialized tourism, scientific inquiry, and environmental conservation.

Mount Vodno, ascending above the Skopje valley, represents the city's premier recreational landscape. Characterized by dense silvicultural expanses, an intricate network of hiking trails, and the monumental Millennium Cross at its zenith, Vodno symbolizes the contemporary identity of the capital while offering a panoramic vantage point of the entire Skopje basin.

The Modern Urban Synthesis

In the current era, Skopje functions as a dynamic metropolitan center that harmonizes historical preservation with progressive urban development. It is a city where monumental heritage, natural capital, and advanced infrastructure exist in a complementary state, fostering

a distinctive urban identity. This multifaceted integration of cultural assets and modern functionality establishes Skopje as a prominent Balkan center of scholarly, educational, and cultural significance.

About Us

The Macedonian Society of Occupational Medicine (MSOM), a constituent of the Macedonian Medical Association (MLD), is the premier professional body for specialists in occupational medicine (OM) and occupational safety and health (OSH) in North Macedonia, with more than 80 active specialists at the moment. The Society is dedicated to:

- **Developing the national legal framework for workplace safety and health.**
- **Advancing occupational medicine services and clinical practice.**
- **Promoting high-level education, training, and research within the field.**

A Legacy of Professional Resilience

Founded in **1967** as the Section for Occupational Medicine, the Society has evolved alongside the industrial and political landscape of North Macedonia.

- **Early Development:** Following WWII, the first professional nuclei were founded at the Republic Institute for Health Protection and some industrial settings (e.g., "Rudnici i Železarnica"). This was followed by the establishment of occupational medicine dispensaries, which applied curative-preventive approach, and were organizationally located either in health institutions or in factories.
- **The Transition Era:** During the critical transition period (1991–2005), the Society played a historical role in preserving occupational medicine as a distinct specialty, resisting pressures to merge the discipline into general family medicine.
- **Modernization:** Since the early 2000s, the Society has transitioned from a traditional focus to a proactive participant in national policy-making and international partnerships.

Institutional Pillars

The success of the Society is deeply integrated with two key national institutions:

- **The Institute of Occupational Health of RNM:** Established as an independent, national reference institution in 2008. Since 2003, it has served as a **WHO Collaborating Center**, the only one of its kind in the country.
- **Department of Occupational Medicine:** Formed as an independent department at the Faculty of Medicine in Skopje in 2001. It serves as the primary educational base, offering modern residency programs and advanced academic degrees.

International and National Leadership

MSOM is a recognized leader on the international stage, maintaining active membership in the **International Commission on Occupational Health (ICOH)** and collaborating closely with the **WHO** and **ILO**.

- **Regional Partnership:** Since 2006, the **South-East European Network on Workers Health (SEENWH)**, involving experts from nine SEE countries, supported by WHO Euro, was established at the Institute of Occupational Health of RNM.
- **Legislative Partner:** The Society is a vital partner to the Ministry of Health and the Ministry of Labor and Social Policy, contributing to the Law on OSH (2007) and the Law on Health Care (2013).

Current Milestone: 2026 Congress

Continuing its tradition of scientific excellence following the successful congresses of 2003 and 2016, MSOM is proud to host the Third Macedonian Congress on Occupational Health with International Participation and the Fourth International Conference of the ICOH Scientific Committee from May 7–10, 2026, in Skopje.

Current Leadership:

- **President:** Prof. Dr. Dragan Mijakoski
- **Past Leadership Highlights:** The Society honors its founders and past presidents, including Dr. Dimitar Kavadarkov, Prof. Dr. Trajko Orušev, Prof. Dr. Vladimir Cvetanov, Dr. Roza Naumoska and Dr. Stefan Todorov.