ANDRIJA STAMPAR
TEACHING INSTITUTE
OF PUBLIC HEALTH

Creating a Healthier Future

REVIEW 2023

SCIENTIFIC ARTICLES IN CURRENT CONTENTS
AND OTHER INDEXED JOURNALS

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Scientific articles
in Current Contents
and other indexed journals

Andrija Stampar Teaching Institute of Public Health

CONTENTS

FOREWORD

The *2023 Review of Scientific articles in Current Contents and other indexed journals* is an annual report of scientific articles published in *Current Contents* journals and other indexed journals by the employees of the Andrija Stampar Teaching Institute of Public Health. The first chapter brings 11 abstracts of original scientific articles, reviews and other articles published in *Current Contents* journals (there were 20 such papers in 2022 and 17 papers in 2021). There are 13 scientific articles published in other indexed journals in the second chapter.

In 2023, there were 210 employees with a university degree (about 50% of the total). Among them were 55 scientists in the Teaching Institute: 43 PhDs and 12 with master's degrees. The number of female scientists dominates the overall number: 45 female scientists and 10 male scientists.

The editorial board congratulates the employees and their external associates for any scientific contribution.

Institute Head

Prof Branko Kolarić, MD, PhD

Review 2023 in digital version is available for download from

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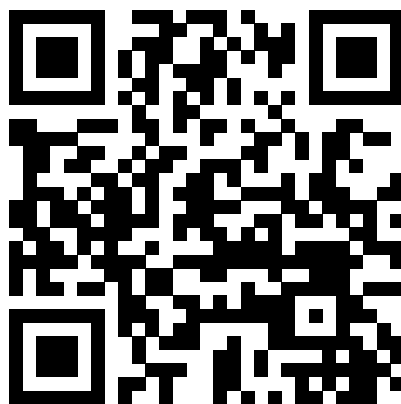
1. Original scientific, review and other articles in Current Contents

1.1. COFFEE SILVER SKIN – HEALTH SAFETY, NUTRITIONAL VALUE, AND MICROWAVE EXTRACTION OF PROTEINS

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Abstract

The aim of this research was to evaluate the health safety (concentrations of pesticide residues and heavy metals) and nutritional parameters (macro- and microminerals and crude fibre) of coffee silver skin (CS), as well to isolate proteins from this by-product using an optimised microwave extraction method. The CS by-product samples showed the highest amount of potassium, followed by calcium, magnesium, and sodium. Iron was found in the highest quantity among the microminerals, followed by copper, manganese, zinc, and chromium. The CS sample showed a large amount of fibre and a moderate quantity of proteins obtained by the optimised microwave extraction method. Four heavy metals (nickel, lead, arsenic, and cadmium) were detected, and all were under the permitted levels. Among the 265 analysed pesticides, only three showed small quantity. The results for the proteins extracted by microwave showed that the total protein concentration values ranged from 0.52 +/- 0.01 mg/L to 0.77 +/- 0.07 mg/L. The highest value of the concentration of total proteins (0.77 +/- 0.07 mg/L) was found in the sample treated for 9 min, using a power of 200 W. Based on these results, it can be concluded that CS is a healthy and nutritionally rich nutraceutical that could be used in the production of new products in the food industry and other industries.

Keywords: coffee silver skin (CS), health safety, nutraceutical, pesticides, heavy metals, fibre, proteins, microwave extraction, food industry

1.2. COMPARISON OF MT-PCR WITH QUANTITATIVE PCR FOR HUMAN BOCAVIRUS IN RESPIRATORY SAMPLES WITH MULTIPLE RESPIRATORY VIRUSES DETECTION

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Abstract

Human bocavirus (HBoV) is an important respiratory pathogen, especially in children, but it is often found in co-detection with other respiratory viruses, which makes the diagnostic approach challenging. We compared multiplex PCR and quantitative PCR for HBoV with multiplex tandem PCR (MT-PCR) in 55 cases of co-detection of HBoV and other respiratory viruses. In addition, we investigated whether there is a connection between the severity of the disease, measured by the localization of the infection, and amount of virus detected in the respiratory secretions. No statistically significant difference was found, but children with large amount of HBoV and other respiratory virus had a longer stay in hospital.

Keywords: human bocavirus, children, respiratory tract, viral load, MT-PCR

1.3. Development of a Pressurized Green Liquid Extraction Procedure to Recover Antioxidant Bioactive Compounds from Strawberry Tree Fruit (*Arbutus unedo* L.)

Bebek Markovinović A[1], Milošević S[2], Teslić N[3], Pavlić B[2], Putnik P[4], Brčić Karačonji I[5,6], Jurica K[7], Lasić D[8], Bursać Kovačević D[1]

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Abstract

Strawberry tree fruits (*Arbutus unedo* L.) are a natural source of valuable biologically active compounds. Therefore, the aim of this work was to develop a green extraction approach using pressurized liquid extraction (PLE) to provide the highest yield of bioactive compounds. Different extraction solvents (distilled water, 50% and 96% ethanol) and different PLE parameters were investigated: temperature (40, 80, and 120 °C), static extraction time (5 and 10 min), and number of cycles (1 and 2). Total phenolic contents (TPC), hydroxycinnamic acids (HCA), flavonols (FL), total flavonoids (TF), condensed tannins (CT), and antioxidant capacity (DPPH and FRAP) were determined in PLE extracts. Solvent type, temperature, static extraction time, and number of cycles had a statistically significant effect on all bioactive compounds and antioxidant capacity ($p \leq 0.05$).

All bioactive compounds were positively correlated with temperature, except for TPC and DPPH. For all polyphenols studied, the optimal PLE parameters were a temperature of 120 °C, a static extraction time of 10 min and 2 cycles. The best solvent for most bioactive compounds was 96% ethanol, except for TPC, for which 50% ethanol was better. This study suggests that PLE is a promising tool to intensify the extraction of bioactive compounds from strawberry tree fruits.

Keywords: strawberry tree fruit, phenolic compounds, antioxidant capacity, pressurized liquid extraction (PLE), green extraction, optimization

1.4. Green techniques for detecting microplastics in marine with emphasis on FTIR and NIR spectroscopy – short review

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Abstract

The amount of microplastics (MPs) present in marine ecosystems are a growing concern, with potential impacts on human health because they are associated with an increase in the ecotoxicity of certain foods, such as fish. As a result, there has been a growing interest in developing effective methods for the analysis of MPs in marine waters. Traditional methods for MP analysis involve visual inspection and manual sorting, which can be time-consuming and subject to human error. However, novel methods have been developed that offer more efficient and accurate analyses. One such method is based on spectroscopy, such as Fourier transform infrared spectroscopy (FTIR). Another method involves the use of fluorescent dyes, which can selectively bind to microplastics and allow for their detection under UV light. Additionally, machine learning approaches have been developed to analyze large volumes of water samples for MP detection and classification. These methods involve the use of specialized algorithms that can identify and classify MPs based on their size, shape, and texture. Overall, these novel methods offer more efficient and accurate analyses of MPs in marine waters, which is essential for understanding the extent and impacts of MP pollution and for developing effective mitigation strategies. However, there is still a need for continued research and development to optimize these methods and improve their sensitivity and accuracy.

Keywords: microplastics, marine pollution, health impact, microplastics analysis, ecotoxicological testing, novel methods, machine learning

1.5. Influenza vaccine effectiveness against influenza A subtypes in Europe: Results from the 2021-2022 I-MOVE primary care multicentre study

Kissling E[1], Pozo F[2,3], Martinez-Baz I[3,4], Buda S[5], Vilcu AM[6], Domegan L[7], Mazagatos C[2,3], Dijkstra F[8], Latorre Margalef N[9], Filipović Kurečić S[10], et al, I-MOVE study team (Kosanović Ličina ML[11], et al)

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Abstract

Background: In 2021-2022, influenza A viruses dominated in Europe. The I-MOVE primary care network conducted a multicentre test-negative study to measure influenza vaccine effectiveness (VE).

Methods: Primary care practitioners collected information on patients presenting with acute respiratory infection. Cases were influenza A(H3N2) or A(H1N1)pdm09 RT-PCR positive, and controls were influenza virus negative. We calculated VE using logistic regression, adjusting for study site, age, sex, onset date, and presence of chronic conditions.

Results: Between week 40 2021 and week 20 2022, we included over 11 000 patients of whom 253 and 1595 were positive for influenza A(H1N1)pdm09 and A(H3N2), respectively. Overall VE against influenza A(H1N1)pdm09 was 75% (95% CI: 43-89) and 81% (95% CI: 45-93) among those aged 15-64 years. Overall VE against influenza A(H3N2) was 29% (95% CI: 12-42) and 25% (95% CI: -41 to 61), 33% (95% CI: 14-49), and 26% (95% CI: -22 to 55) among those aged 0-14, 15-64, and over 65 years, respectively. The A(H3N2) VE among the influenza vaccination target group was 20% (95% CI: -6 to 39). All 53 sequenced A(H1N1)pdm09 viruses belonged to clade 6B.1A.5a.1. Among 410 sequenced influenza A(H3N2) viruses, all but eight belonged to clade 3C.2a1b.2a.2.

Discussion: Despite antigenic mismatch between vaccine and circulating strains for influenza A(H3N2) and A(H1N1)pdm09, 2021-2022 VE estimates against circulating influenza A(H1N1)pdm09 were the highest within the I-MOVE network since the 2009 influenza pandemic. VE against A(H3N2) was lower than A(H1N1)pdm09, but at least one in five individuals vaccinated against influenza were protected against presentation to primary care with laboratory-confirmed influenza.

Keywords: Europe, influenza, influenza vaccine, multicentre study, vaccine effectiveness

1.6. PHYSICAL ACTIVITY OF CHILDREN AND ADOLESCENTS IN CROATIA: A GLOBAL MATRIX 4.0 SYSTEMATIC REVIEW OF ITS PREVALENCE AND ASSOCIATED PERSONAL, SOCIAL, ENVIRONMENTAL, AND POLICY FACTORS

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Abstract

Background: The previous review of physical activity (PA) among Croatian children and adolescents was conducted a decade ago. Therefore, the aim of this study was to summarize recent evidence on PA of Croatian children and adolescents and associated personal, social, environmental, and policy factors. Methods: Eighteen experts reviewed the available evidence and provided ratings (from the lowest grade 'F' to the highest grade 'A+') for the 10 Global Matrix indicators. A systematic search with 100 keywords was conducted in Hrcak, PubMed/MEDLINE, Scopus, SPORTDiscus, and Web of Science for documents published from January 01, 2012, to April 15, 2022. We also conducted internet searches and secondary analyses of data (relative frequencies) from 6 studies. Results: After assessing 7562 references, we included 90 publications in the review and 18 studies (83.3% of medium-to-good quality) in evidence synthesis. We found a high prevalence of insufficient PA (especially among girls) and excessive screen time (especially among boys). PA participation of children and adolescents in Croatia has declined over time. The following grades were assigned to the indicators for Croatia: B- for overall PA, C- for organized sport and PA, C for active play, C- for active transportation, D+ for sedentary behavior, inconclusive for physical fitness, D+ for family and peers, B- for school, B- for community and environment, and D+ for government. Conclusions: Coordinated actions are needed across sectors to improve PA promotion, with a focus on increasing PA among girls, reducing sedentary screen time among boys, improving parental support for PA, and further development of national PA policies.

Keywords: sport, active travel, sedentary behavior, primary school, secondary school

1.7. Psychosocial risks emerged from COVID-19 pandemic and workers' mental health

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Abstract

This paper examines the impact of work in a pandemic context on workers' mental health. Psychosocial risks have always been a challenging aspect of workplace health and safety practices. Moreover, the COVID-19 pandemic has affected workplaces in all sectors causing unexpected changes in work organization and working conditions, leading to the emergence of new psychosocial risks for health and wellbeing of workers. This mini-review aims to identify the main work stressors during pandemic period and related mental health problems to suggest recommendations and adjust health and safety practices regarding workplace mental health. A literature search has been performed using MEDLINE/PubMed, ResearchGate and Google Scholar databases, selecting articles focusing on work-related stressors and workers' mental health problems related to the pandemic. Specific psychosocial risks have been identified, including fear of contagion, telework-related risks, isolation and stigmatization, rapid digitalization demands, job insecurity, elevated risk of violence at work or home, and work-life imbalance, among others. All those risks can lead to elevated levels of stress among workers and affect their mental health and wellbeing, especially in terms of psychological distress, anxiety, and depression. As one of the social determinants of health, the workplace has an important and moderating role in workers' health. Therefore, in the pandemic context more than ever health protection practices at the workplace should be devoted to mental health problems. Recommendations provided in this study are expected to contribute to workplace practices to preserve and promote workers' mental health.

Keywords: COVID-19, mental health, pandemic, psychosocial risks, workplace stress

1.8. Self-reported HPV vaccination status and HPV vaccine hesitancy in a nationally representative sample of emerging adults in Croatia

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Abstract

Introduction: The aim of this study was to determine self-reported human papillomavirus (HPV) vaccination status among emerging adults in Croatia, intention to get the HPV vaccine among unvaccinated individuals and correlates of HPV vaccine hesitancy.

Methods: Data were collected via a cross-sectional survey based on a probabilistic national sample. The sample included 1,197 individuals aged 18-25 years (50.6% were women) who were recruited from November 2021 to February 2022 as part of the commercial online panel. Analyses included 981 participants who correctly answered two "attention trap" questions using descriptive statistics and multivariate analyses. The data were post-hoc weighted for gender and age and adjusted for clustering effect. To adjust standard errors for the sampling design, multivariate analyses were carried out using the complex samples module in the IBM SPSS 27 statistical software package.

Results: Overall, 18.3% of participants (25.0% of women and 11.7% of men) reported that they were HPV vaccinated, while 21.9% did not know their HPV vaccination status. Of those vaccinated, 65.6% were women. The odds of being HPV-vaccinated were significantly higher among female participants. Among the unvaccinated, 35.4% expressed a willingness to get the vaccine. The odds of vaccination hesitancy were significantly lower among women, participants who reported a higher

perceived risk of STIs, those who recognized that HPV could result in cervical cancer, and significantly higher among those who were more religious.

Conclusion: Our findings suggest a need to increase HPV vaccination uptake in Croatia through raising awareness about HPV vaccine effectiveness and also through the implementation of strategies to make vaccination more available.

Keywords: Croatia, HPV, HPV vaccination, emerging adults, self-reported HPV vaccination status, vaccine hesitancy

1.9. SEROPREVALENCE AND MICROSCOPY DETECTION RATES OF STRONGYLOIDIASIS IN CROATIAN PATIENTS WITH EOSINOPHILIA

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Abstract

Infection with the parasitic nematode *Strongyloides stercoralis* is characteristic for tropical and subtropical regions of the world, but autochthonous cases have been reported in European countries as well. Here we present the first nation-wide survey of *S. stercoralis* seroprevalence in Croatian individuals presenting with eosinophilia, and evaluate the fraction of positive microscopy rates in stool specimens of seropositive individuals. In our sample of 1407 patients tested between 2018 and 2021, the overall prevalence of strongyloidiasis was 9.31%, with significantly higher rates in those older than 60 years of age ($P = 0.005$). Of those, one-quarter (25.95%) were also positive following microscopy examination of faeces after using the Merthiolate-iodine-formaldehyde concentration method. Our findings reinforce the notion of endemic strongyloidiasis transmission in Croatia, particularly in older individuals, and highlight the need to consider the presence of *S. stercoralis* in patients with eosinophilia.

1.10. Telework-related risk factors for musculoskeletal disorders

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Abstract

Telework has become considerably more common during the ongoing pandemic. Although working remotely may have numerous advantages, negative impacts on workers' health and safety should also be considered. Telework is a major contributor to the development or aggravation of work-related musculoskeletal disorders where unsuited workstation ergonomics, sedentary behavior, as well as psychosocial and organizational factors play a role. This paper aims to identify telework-related risks and their impact on musculoskeletal health as well as provide recommendations that may be useful in constructing future preventive measures. A comprehensive literature search regarding the topic has been performed. Teleworkers experience musculoskeletal pain and discomfort mostly in low back area, neck, shoulders, arms, and hands. Poor ergonomic solutions when it comes to workstation design resulting in prolonged sitting in non-neutral positions contribute to the development and aggravation of musculoskeletal disorders in teleworkers. Working with inadequately placed screens and laptops and sitting in maladjusted seats without usual functionalities and ergonomic support is associated with musculoskeletal pain and discomfort. Extended working hours with fewer rest periods to meet increased work demands, social isolation, and lack of support from work colleagues and superiors as well as blurred work-home boundaries and omnipresence of work are commonly stated psychosocial and organizational

factors associated with musculoskeletal disorders. Environmental factors such as poor lighting and glare, inadequate room temperature, and ventilation or noise, are frequently overlooked remote workstation risk factors. For a certain part of workers, telework will remain a common way of work in the post-pandemic period. Therefore, it is essential to identify telework-related risk factors for musculoskeletal disorders and address them with timely preventive measures tailored to each remote workstation's risks and individual workers' needs.

1.11. Ten golden rules for optimal antibiotic use in hospital settings: the WARNING call to action

Worldwide Antimicrobial Resistance National/International Network Group (WARNING) Collaborators (Vraneš J[1,2] et al)

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Abstract

Antibiotics are recognized widely for their benefits when used appropriately. However, they are often used inappropriately despite the importance of responsible use within good clinical practice. Effective antibiotic treatment is an essential component of universal healthcare, and it is a global responsibility to ensure appropriate use. Currently, pharmaceutical companies have little incentive to develop new antibiotics due to scientific, regulatory, and financial barriers, further emphasizing the importance of appropriate antibiotic use. To address this issue, the Global Alliance for Infections in Surgery established an international multidisciplinary task force of 295 experts from 115 countries with different backgrounds. The task force developed a position statement called WARNING (Worldwide Antimicrobial Resistance National/International Network Group) aimed at raising awareness of antimicrobial resistance and improving antibiotic prescribing practices worldwide. The statement outlined is 10 axioms, or "golden rules," for the appropriate use of antibiotics that all healthcare workers should consistently adhere in clinical practice.

Keywords: antibiotic therapy, antimicrobial resistance, antimicrobial stewardship programs, hospital-acquired infections, infection prevention and control, systemic antibiotic prophylaxis, surgical site infections

2. ORIGINAL SCIENTIFIC AND REVIEW ARTICLES IN OTHER INDEXED JOURNALS

2.1. A PILOT SENTINEL SURVEILLANCE SYSTEM TO MONITOR TREATMENT AND TREATMENT OUTCOMES OF CHRONIC HEPATITIS B AND C INFECTIONS IN CLINICAL CENTRES IN THREE EUROPEAN COUNTRIES, 2019

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Abstract

Background: The World Health Organization European Action Plan 2020 targets for the elimination of viral hepatitis are that > 75% of eligible individuals with chronic hepatitis B (HBV) or hepatitis C (HCV) are treated, of whom > 90% achieve viral suppression.

Aim: To report the results from a pilot sentinel surveillance to monitor chronic HBV and HCV treatment uptake and outcomes in 2019.

Methods: We undertook retrospective enhanced data collection on patients with a confirmed chronic HBV or HCV infection presenting at one of seven clinics in three countries (Croatia, Romania and Spain) for the first time between 1 January 2019 and 30 June 2019. Clinical records were reviewed from date of first attendance to 31 December 2019 and data on sociodemographic, clinical history, laboratory results, treatment and treatment outcomes were collected. Treatment eligibility, uptake and case outcome were assessed.

Results: Of 229 individuals with chronic HBV infection, treatment status was reported for 203 (89%). Of the 80 individuals reported as eligible for treatment, 51% (41/80) were treated of whom 89% (33/37) had achieved viral suppression. Of 240 individuals with chronic HCV infection, treatment status was reported for 231 (96%). Of 231 eligible individuals, 77% (179/231) were treated, the majority of whom had received direct acting antivirals (99%, 174/176) and had achieved sustained virological response (98%, 165/169).

Conclusion: Treatment targets for global elimination were missed for HBV but not for HCV. A wider European implementation of sentinel surveillance with a representative sample of sites could help monitor progress towards achieving hepatitis control targets.

Keywords: hepatitis B, hepatitis C, surveillance, treatment.

2.2. ADHERENCE TO THE MEDITERRANEAN DIET RELATED TO THE HEALTH RELATED AND WELL-BEING OUTCOMES OF EUROPEAN MATURE ADULTS AND ELDERLY, WITH AN ADDITIONAL REFERENCE TO CROATIA

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Abstract

With the increase in life expectancy, expectation of a longer healthy life is also increasing. Importance of consumption of certain foods is confirmed to have a strong effect on quality of life. One of the healthiest dietary patterns consistently associated with a range of beneficial health outcomes is the Mediterranean diet (MD). The aim of this study was to assess MD adherence in the population over 50 years of age, in Europe, with special reference to Croatia, and to assess regional differences and investigate the association with health-related indicators (disease incidence, body mass index (BMI), grip strength measure, control, autonomy, self-realization, and pleasure scale (CASP-12)). This research uses data from the SHARE project for the population over 50 years of age. The frequency of individual responses was analysed (frequencies, cross tables, and appropriate tests of significance, depending on the data set), and logistic regression was used to connect adherence to the Mediterranean diet with health indicators. The results of the study indicate a positive correlation between adherence to the principles of the Mediterranean diet with CASP and self-perception of health, which the

followers of the MD pattern predominantly rate as "very good" or "excellent" (37.05%) what is significantly different ($p < 0.05$) from individuals which do not follow the patterns of MD (21.55%). The regression models indicate significant changes in the measure of maximum grip strength also among MD followers ($OR_{MEDIUM} = 1.449$; $OR_{HIGH} = 1.293$). Data for EU countries are also classified by regions (Central and Eastern; Northern, Southern and Western Europe), additionally allocating Croatia, and the trends in meat, fish and egg consumption showed the greatest differences for Croatian participants (39.6% twice a week) versus participants from four European regions. Data for Croatia deviates from the European average also in terms of the proportion of overweight and obese persons in all observed age groups, of which the largest proportion is in the 50–64 age group (normal BMI: only 30.3%). This study extended the currently available literature covering 27 European countries, placing the findings in a wider geographical context. The Mediterranean diet has once again proven to be an important factor related to health-related behaviour. The presented results are extremely important for public health services, indicating possible critical factors in preserving the health of the population over 50 years old.

Keywords: health-related behaviours (HBR), food intake, well-being, elderly, Mediterranean diet

2.3. COMBINED APPROACH: FFQ, DII, ANTHROPOMETRIC, BIOCHEMICAL AND DNA DAMAGE PARAMETERS IN OBESE WITH BMI ≥ 35 KG M^{-2}

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Abstract

Although obesity with its comorbidities is linked with higher cancer risk, the data on genome stability in the obese/severely obese are scarce. This is the first study with three DNA damage assessment assays (Fpg-modified and alkaline comet assays and micronucleus cytome assay) performed on a severely obese population (n = 53) where the results were compared with daily intake of food groups, nutrient intake, dietary inflammatory index (DII), and anthropometric and biochemical parameters usually measured in obese individuals. Results demonstrated the association between DNA damage levels and a decrease in cell proliferation with anthropometric measurements and the severity of obese status, together with elevated levels of urates, inorganic phosphates, chlorides, and hs troponin I levels. DII was connected with oxidative DNA damage, while BMI and basal metabolic rate (BMR) were associated with a decrease in cell proliferation and DNA damage creation. Measured daily BMR and calculated daily energy intake from the food frequency questionnaire (FFQ) demonstrated no significant difference (1792.80 vs. 1869.86 kcal day^{-1} mean values). Groups with higher DNA damage than expected (tail intensity in comet assay >9% and >12.4%, micronucleus frequency >13),

consumed daily, weekly, and monthly more often some type of food groups, but differences did not show a clear influence on the elevated DNA damage levels. Combination of all three DNA damage assays demonstrated that some type of damage can start earlier in the obese individual lifespan, such as nuclear buds and nucleoplasmic bridges, then comes decrease in cell proliferation and then elevated micronucleus frequencies, and that primary DNA damage is not maybe crucial in the overweight, but in severely obese. Biochemically changed parameters pointed out that obesity can have an impact on changes in blood cell counts and division and also on genomic instability. Assays were able to demonstrate groups of sensitive individuals that should be further monitored for genomic instability and cancer prevention, especially when obesity is already connected with comorbidities, 13 different cancers, and a higher mortality risk with 7–10 disease-free years loss. In the future, both DNA damage and biochemical parameters should be combined with anthropometric ones for further obese monitoring, better insight into biological changes in the severely obese, and a more individual approach in therapy and treatment. Patients should also get a proper education about the foodstuff with pro- and anti-inflammatory effect.

2.4. CUTANEOUS MANIFESTATIONS OF THE COVID-19 PANDEMIC IN SCHOOLCHILDREN AND ADOLESCENTS

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Abstract

This review article focuses on cutaneous manifestations in schoolchildren and adolescents 6 to 18 years old connected with various aspects of the Severe Acute Respiratory Syndrome CoronaVirus 2 (SARS-CoV-2) pandemic, including personal protective equipment (PPE), SARS-CoV-2 infection, and the SARS-CoV-2 vaccine. The use of PPE has been associated with mask-related acne due to microbiome dysbiosis and disruption of skin homeostasis, leading to the emergence of new acne or exacerbation of pre-existing acne. Chilblain-like lesions, erythema multiforme-like eruptions, and cutaneous manifestations of multisystem inflammatory syndrome related to SARS-CoV-2 are the most commonly described skin manifestations of SARS-CoV-2 infection. The proposed mechanisms involve either the direct interaction of the virus with the skin through cutaneous receptor angiotensin-converting enzyme 2 in the epidermal basal layer or hyperactive immune responses. The impact of SARS-CoV-2 infection has also been described on adnexa, including hair changes such as alopecia areata and telogen effluvium, as well as nail changes presenting as onychomadesis and periungual desquamation. Cutaneous adverse effects of the SARS-CoV-2 vaccine have been described in case reports and differ from those in adults. Therefore, there is a need for increased awareness regarding the most prevalent cutaneous manifestations associated with COVID-19 in children because they tend to be mild or nonspecific in nature.

Keywords: SARS-CoV-2 pandemic, COVID-19, cutaneous manifestations, adolescents, children

2.5. Exploring adherence in patients with advanced breast cancer: focus on CDK4/6 inhibitors

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Abstract

Treatment adherence is crucial for optimal outcomes in advanced breast cancer, but can be challenging due to various factors, *i.e.* patients' attitudes and behavior upon diagnosis, and complex therapies with high adverse effect rates. Our aim was to explore the adherence to oral anticancer medications (OAM) in women with advanced breast cancer, focusing on cyclin-dependent kinase 4 and 6 inhibitors (CDKI), and identify factors associated with the adherence. We conducted a cross-sectional study at the University Hospital Centre Zagreb, Croatia, involving women with stage IV advanced breast cancer receiving OAM. Data collection included a questionnaire assessing socio-demographic and clinical information, Beck Depression Inventory-II for depressive symptoms, Medication Adherence Report Scale (MARS-5) for adherence to OAM, and Beliefs about Medicines Questionnaire. Plasma concentrations of CDKI were confirmed by LC-MS/MS in three randomly selected participants. A total of 89 women were included. The most prescribed OAMs were anti-estrogen (71.3%) and CDKI (60.9%). MARS-5 scores (mean: 24.1 ± 1.6) correlated with CDKI plasma concentrations. Forgetfulness was the primary reason for non-adherence (25.9%). Women receiving CDKI ($p = 0.018$), without depressive symptomatology ($p = 0.043$), and with more positive beliefs about medicines were more adherent ($p < 0.05$). This study enhances understanding of medication adherence in advanced breast cancer and identifies influential factors.

Keywords: advanced breast cancer, oral anticancer therapy, CDK 4/6 inhibitors, adherence, depressive symptoms, beliefs about medicine

2.6. Genetic scores for predicting longevity in the Croatian oldest-old population

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Abstract

Longevity is a hallmark of successful ageing and a complex trait with a significant genetic component. In this study, 43 single nucleotide polymorphisms (SNPs) were chosen from the literature and genotyped in a Croatian oldest-old sample (85+ years, sample size (N) = 314), in order to determine whether any of these SNPs have a significant effect on reaching the age thresholds for longevity (90+ years, N = 212) and extreme longevity (95+ years, N = 84). The best models were selected for both survival ages using multivariate logistic regression. In the model for reaching age 90, nine SNPs explained 20% of variance for survival to that age, while the 95-year model included five SNPs accounting for 9.3% of variance. The two SNPs that showed the most significant association (p ≤ 0.01) with longevity were *TERC* rs16847897 and *GHRHR* rs2267723. Unweighted and weighted Genetic Longevity Scores (uGLS and wGLS) were calculated and their predictive power was tested. All four scores showed significant correlation with age at death (p ≤ 0.01). They also passed the ROC curve test with at least 50% predictive ability, but wGLS90 stood out as the most accurate score, with a 69% chance of accurately predicting survival to the age of 90.

Keywords: single nucleotide polymorphisms, genetic risk score, longevity, nonagenarians, oldest-old, Croatia

2.7. INTERIM 2022/23 INFLUENZA VACCINE EFFECTIVENESS: SIX EUROPEAN STUDIES, OCTOBER 2022 TO JANUARY 2023

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Abstract

Background: Between October 2022 and January 2023, influenza A(H1N1)pdm09, A(H3N2) and B/Victoria viruses circulated in Europe with different influenza (sub)types dominating in different areas.

Aim: To provide interim 2022/23 influenza vaccine effectiveness (VE) estimates from six European studies, covering 16 countries in primary care, emergency care and hospital inpatient settings.

Methods: All studies used the test-negative design, but with differences in other study characteristics, such as data sources, patient selection, case definitions and included age groups. Overall and influenza (sub)type-specific VE was estimated for each study using logistic regression adjusted for potential confounders.

Results: There were 20,477 influenza cases recruited across the six studies, of which 16,589 (81%) were influenza A. Among all ages and settings, VE against influenza A ranged from 27 to 44%. Against A(H1N1)pdm09 (all ages and settings), VE point estimates ranged from 28% to 46%, higher among children (< 18 years) at 49–77%. Against A(H3N2), overall VE ranged from 2% to 44%, also higher

among children (62–70%). Against influenza B/Victoria, overall and age-specific VE were ≥ 50% (87–95% among children < 18 years).

Conclusions: Interim results from six European studies during the 2022/23 influenza season indicate a ≥ 27% and ≥ 50% reduction in disease occurrence among all-age influenza vaccine recipients for influenza A and B, respectively, with higher reductions among children. Genetic virus characterisation results and end-of-season VE estimates will contribute to greater understanding of differences in influenza (sub)type-specific results across studies.

Keywords: influenza, vaccine effectiveness, multicentre study, test-negative design, Europe

2.8. INVESTIGATION OF SARS-CoV-2 DETECTION METHOD APPLICABILITY AND VIRUS OCCURRENCE IN FOOD AND FOOD PACKAGING

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Abstract

Research background: While it is clear that SARS CoV-2 coronavirus is the primary respiratory virus, there are no entirely clarified ways of transmission. Foodborne transmission has remained an unexplained path. Therefore, the goals of this paper are to examine and present an assessment of the most appropriate of the four selected kits for RNA extraction for the testing and detection of SARS-CoV-2 on food packaging surfaces, food surfaces, and in food. This will enable to indicate the possibility of infection through contact or direct food consumption.

Experimental approach: Finding the best technique is vital as RNA extraction is one of the essential elements in detecting SARS-CoV-2. This was achieved through an experiment with four commercial kits following the original manufacturers' protocols, and with a modification of the original protocols that included the use of ethanol and isopropanol. The selected kit was used for RNA extraction from the swabs of packaging surfaces, food surface, and ready-to-eat food samples. The coronavirus was then identified using real-time reverse transcription-polymerase chain reaction (RT-PCR) assays to determine whether the SARS-CoV-2 virus or viral particles are present in the food chain with the overall purpose of demonstrating the possibility that food can contribute as a vehicle for the transmission of the virus.

Results and conclusions: The findings of this investigation made the most effective extraction kit and protocol stand out. The results of the applicability of the kit indicated

a significant share of positive samples of viral SARS-CoV-2 virus particles on surfaces from the environment where infected persons with 'silent' COVID-19 infection, with mild symptoms or no symptoms, were present. However, according to the findings of the second part of the study, the virus was not detected on the examined samples of food packaging surfaces, food surfaces, and food.

Novelty and scientific contribution: The presented results distinguished one of the most suitable protocols for isolating RNA from environmental surface samples. The main contribution of the study is in the presentation of the results, that is, the examination of samples that are primarily related to the food chain, food packaging, food surfaces, and ready-to-eat food. The results of this study could also be helpful for further determination of the potential of food as a vector for the transmission of coronaviruses.

2.9. Knowledge about and prevalence of *Chlamydia trachomatis* in a population-based sample of emerging Croatian adults

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Abstract

To determine the prevalence of genital *Chlamydia trachomatis* (chlamydia) infection, knowledge about chlamydia and experience of previous testing for chlamydia, we carried out a national probability-based survey in emerging adults aged 18–25 years in Croatia in 2021–2022. Participants ($n = 1197$), members of a national online panel, completed a web-based questionnaire that collected information on socio-demographics, sexual behaviours and knowledge about sexually transmitted infections (STIs). Urine specimens from a sample of sexually experienced participants were self-collected and tested for chlamydia using Cobas 4800 CT/NG test. To achieve broad representativeness of the emerging adult population in the country, we applied post-hoc weighting for gender and age. Multivariable ordinary least squares linear regression was used to determine correlates of knowledge about chlamydia infection and binomial logistic regression to assess correlates of the willingness to test for chlamydia. Among 448 participants who sent in their urine specimens chlamydia prevalence was 2.5% (95% CI 1.2–5.1) in women and 1.0% (0.3–3.2%) in men. A total of 8.0% of women and 4.7% men reported testing for chlamydia prior to the survey. About a quarter of the sample was characterized by not answering correctly any of the six

questions related to knowledge about chlamydia, while only 9.6% had five or six correct answers. In the multivariable analysis, significantly higher odds of willingness to test for chlamydia were found in females compared to males ($OR = 1.34$, $p = 0.024$), those with better knowledge about the infection ($OR = 1.11$, $p = 0.005$), and those with lower religiosity ($OR = 0.91$, $p = 0.017$). In conclusion, prevalence of chlamydia in emerging adults in Croatia is considerable. Efforts to control this infection should focus on primary prevention and targeted testing combined with effective case management strategies.

Keywords: sexually-transmitted, infections, interventions, attitudes

2.10. Migration of BPA from food packaging and household products on the Croatian market

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Abstract

BPA is a plasticizer for the production of polycarbonate plastics and epoxy resins and is widely used in the production of household goods, including food packaging. Free BPA is known to migrate from packaging to food, and its uptake has been associated with adverse health effect, particularly the disruption of endocrine activity. The presence and migration of BPA from plastic consumer products are subject to strict regulation in the EU. The aim of this study is to analyse the migration of BPA from different packaging items and household products sold on the Croatian market. To simulate real life exposure, we treated samples with a food simulant. The analytical performance was confirmed with the EU requirements. BPA levels were assessed in 61 samples by HPLC-FLD and the LOQ of the method was $0.005 \, \mathrm{mg \, kg^{-1}}$ for the food simulant. These results showed that the levels of BPA that migrated to the food simulant were below LOQ and in accordance with the specific migration limit into food, which was defined as $0.05 \, \mathrm{mg \, kg^{-1}}$ for all samples. None of the analysed products presented a health hazard. However, these regulations do not refer to products intended for children's use, in which BPA is banned. Furthermore, regulations require testing before putting products on the market, and previous research shows that possible BPA migration occurs due to various uses, along with a cumulative effect of exposure from even very small concentrations. Therefore, for accurate BPA consumer exposure evaluation and possible health risks, a comprehensive approach is needed.

Keywords: BPA, household products, food packaging, health, Croatia

2.11. Prevalence of chronic HCV infection in EU/EEA countries in 2019 using multiparameter evidence synthesis

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Abstract

Background: Epidemiological data are crucial to monitoring progress towards the 2030 Hepatitis C Virus (HCV) elimination targets. Our aim was to estimate the prevalence of chronic HCV infection (cHCV) in the European Union (EU)/European Economic Area (EEA) countries in 2019.

Methods: Multi-parameter evidence synthesis (MPES) was used to produce national estimates of cHCV defined as: $\pi = \pi_{rec}\rho_{rec} + \pi_{ex}\rho_{ex} + \pi_{non}\rho_{non}$; π_{rec}, π_{ex}, and π_{non} represent cHCV prevalence among recent people who inject drugs (PWID), ex-PWID, and non-PWID, respectively, while ρ_{rec}, ρ_{ex}, and ρ_{non} represent the proportions of these groups in the population. Information sources included the European Centre for Disease Prevention and Control (ECDC) national operational contact points (NCPs) and prevalence database, the European Monitoring Centre for Drugs and Drug Addiction databases, and the published literature.

Findings: The cHCV prevalence in 29 of 30 EU/EEA countries in 2019 was 0.50% [95% Credible Interval (CrI): 0.46%, 0.55%]. The highest cHCV prevalence was observed in the eastern EU/EEA (0.88%; 95% CrI: 0.81%, 0.94%). At least 35.76% (95% CrI: 33.07%, 38.60%) of the overall cHCV prevalence in EU/EEA countries was associated with injecting drugs.

Interpretation: Using MPES and collaborating with ECDC NCPs, we estimated the prevalence of cHCV in the EU/EEA to be low. Some areas experience higher cHCV prevalence while a third of prevalent cHCV infections was attributed to PWID. Further efforts are needed to scale up prevention measures and the diagnosis and treatment of infected individuals, especially in the east of the EU/EEA and among PWID.

Keywords: chronic hepatitis, elimination, Europe, HCV, hepatitis C, prevalence

2.12. RHINOVIRUS – A TRUE RESPIRATORY THREAT OR A COMMON INCONVENIENCE OF CHILDHOOD?

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Abstract

A decade-long neglect of rhinovirus as an important agent of disease in humans was primarily due to the fact that they were seen as less virulent and capable of causing only mild respiratory infections such as common cold. However, with an advent of molecular diagnostic methods, an increasing number of reports placed them among the pathogens found in the lower respiratory tract and recognized them as important risk factors for asthma-related pathology in childhood. As the spread of rhinovirus was not severely affected by the implementation of social distancing and other measures during the coronavirus disease 2019 (COVID-19) pandemic, its putative pathogenic role has become even more evident in recent years. By concentrating on children as the most vulnerable group, in this narrative review we first present classification and main traits of rhinovirus, followed by epidemiology and clinical presentation, risk factors for severe forms of the disease, long-term complications and the pathogenesis of asthma, as well as a snapshot of treatment trials and studies. Recent evidence suggests that the rhinovirus is a significant contributor to respiratory illness in both high-risk and low-risk populations of children.

Keywords: rhinovirus, respiratory pathology, common cold, community-acquired pneumonia, bronchiolitis, wheezing, asthma, virology

2.13. WATER FOR HUMAN CONSUMPTION IN ZAGREB CITY AS A POSSIBLE SOURCE OF SOME CONTAMINANTS

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Abstract

In the Zagreb city area extensive monitoring of water for human consumption has been carried out for years, which includes several dozen different chemical, biological and physical parameters. Given the daily water intake in our bodies, the possibility of ingesting certain contaminants via water has a significant role. This especially applies to nitrates, which are in the second place of importance, since it has been found that the water is their source. In this paper, we present results of the presence for the following contaminants: aluminium, cadmium, chlorate and chlorite, nitrate and mercury in water that can be consumed via water in the City of Zagreb for the period 2016-2020. The results indicate stable average annual values of monitored contaminants, except for aluminium and chlorates, for which it was found that the values of annual averages differ several times. However, even in cases of higher values, their contribution to water intake does not pose a risk to the health of consumers, nor it significantly contribute to their overall intake. Still, given the assumption that this is a specific exposure, to which the consumer is tied to the place of residence, it is important to constantly monitor trends, so that each exposure is kept to a minimum.

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