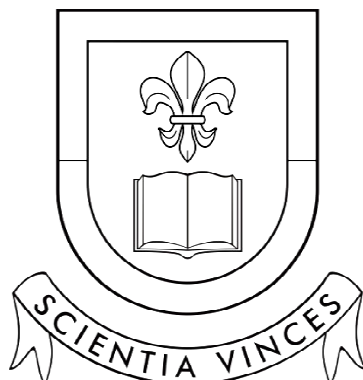


**DAUGAVPILS UNIVERSITĀTE
DAUGAVPILS UNIVERSITY**



***DAUGAVPILS UNIVERSITĀTES
63. STARPTAUTISKĀS
ZINĀTNISKĀS KONFERENCES
TĒZES***

***ABSTRACTS OF
THE 63rd INTERNATIONAL
SCIENTIFIC CONFERENCE OF
DAUGAVPILS UNIVERSITY***

DAUGAVPILS UNIVERSITĀTES
AKADĒMISKAIS APGĀDS „SAULE”
2021

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Daugavpils Universitātē docētāju un studējošo zinātniskās konferences notiek kopš 1958. gada. Konferencēm ir starpdisciplinārs raksturs, tajās piedalās gan studējošie, gan arī ievērojami zinātnieki no dažādām pasaules valstīm. Daugavpils Universitātes 63. starptautiskās zinātniskās konferences pētījumu tematika ir ļoti plaša – eksaktajās, humanitārajās, izglītības, mākslas un sociālo zinātņu jomās.

Krājumā *Daugavpils Universitātes 63. starptautiskās zinātniskās konferences tēzes = Abstracts of the 63rd International Scientific Conference of Daugavpils University* apkopoti materiāli, kas tiks prezentēti konferences darba grupās 2021. gada 15.-16. aprīlī un kas atbilst konferences formālajām prasībām.

Krājuma veidotāji saglabā autoru iesniegto tēžu lingvistisko un gramatisko struktūru.

Par norādītajiem faktiem, izteiktajiem viedokļiem un lietoto terminoloģiju atbild tēžu autori.

The annual scientific conferences at Daugavpils University have been organized since 1958. The themes of research presented at the conferences cover all spheres of life. Due to the facts that the conference was of interdisciplinary character and that its participants were students and outstanding scientists from different countries, the subjects of scientific investigations were very varied – in the domains of exact sciences, the humanities, education, art and social sciences.

The Collection of Abstracts of the 63rd Scientific Conference of Daugavpils University contains the abstracts on researches, which will be presented in the corresponding work groups organized within the framework of the conference in April, 15–16, 2021. In the abstracts published in *Daugavpils Universitātes 63. starptautiskās zinātniskās konferences tēzes = Abstracts of the 63rd International Scientific Conference of Daugavpils University* we have preserved the authors' style (linguistic and grammatical structures), and the authors themselves are responsible for the facts and opinions reflected and the terminology used in their abstracts.

MĀKSLA

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ART

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21ST CENTURY PAINTING: CLOSE-UPS OF THE TECHNIQUE

Key words: contemporary painting, mixed media, materials, concepts

In 21st century painting, artists formulate their ideas, thoughts, comments and stories to the viewer using not only the possibilities of one technique or material, but using two or more or multi-techniques, diverse materials and creative work methods as visual means of artwork. This allows the artist to create a unique form of the painting, individual content, as well as more creatively depict and present the concept contained in the work.

When selecting representatives of world and Latvian contemporary painting and their artistic creative technologies for the research, the case analysis method is used. The aim of the research is to represent the most popular and non-traditional techniques and their synthesis in the space of contemporary painting.

Silvija Ozola

ARRANGEMENT OF LIVONIAN AND LATGALIAN POPULATION CENTRES AND TRAFFIC ROUTES UNTIL THE 13TH CENTURY – THE BASIS OF THE MODERN POPULATION SYSTEM IN NORTH-CENTRAL AND EASTERN LATVIA

The location of settlements and cities in the territory of modern Latvia has not developed by accident. The people who lived here over many thousands of years well acquainted with the local geographical and climatic conditions knew how to install habitats using terrain features and natural resources. Representatives of different ethnic communities developed building skills, architectural structures and cultural traditions, promoted trade links through waterways. Gradually, the representatives of the Finno-Ugric and Baltic tribes, under the influence of various natural processes and historical events, developed the location of population centres and set up earth road tracing for traffic. In the territory of Latvia, until the entry of German crusaders, the basis for a modern population system was created.

Aims of paper: analyzing the impact of the ancient location of population centres and road tracing on economic growth and well-being of local people.

Methodology: analysis of archive documents and cartographic materials, published information, photo fixations.

Research problem: today, various territorial development projects are being developed, ignoring the evolution of settlement development and cultural identity, the historically established hierarchy of settlement centres, which was influenced by the economic activities of local people and traffic routes for communication; unsuccessful and ill-considered solutions cause significant damage to the economy.

Research novelty: analysis of the Livonian and Latgalian settlements and traffic for trade relations and its early development created opportunities for the basis of the modern population system in North-central and Eastern Latvia.

Applications to practice: research will help to find successful solutions for quality improvement of urban spaces and promoting the economic activities of people.

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ARTISTIC LIFE IN THE INTERWAR PERIOD: ACTIVITIES OF KĀRLIS BALTGAILIS (1893–1979) IN JELGAVA

After World War I in Latvia, society understood the need for the development and promotion of cultural life, but these issues were replaced by more important economic, social and political challenges. At the time, artistic life was mostly concentrated in the capital, outside of which there was little interest in fine art exhibitions. The situation improved thanks to the initiative of the artists themselves, a variety of new institutions emerged, contributing to the development of cultural processes.

In 1920, Kārlis Baltgailis (1893–1979) returned to his native land after being a soldier in Omsk and joined Latvia's art life gradually. From 1922 he lived in Jelgava and was a teacher of drawing, art history and drawing methodology at the Jelgava Teachers' Institute, where he taught until its closing in 1944. For Baltgailis the almost non-existent cultural life outside Riga was one of the incentives to encourage the foundation of the artists' and writers' society "Zaļā vārna" ("Green Crow", 1925–1939). Although its official place of foundation was Riga, the chairman of the society's board and the main organiser of events Baltgailis lived and worked in Jelgava. So it became the second most important centre of the society's activities, also most of the exhibitions organised by society took place in Jelgava. In 1928, Baltgailis was one of the initiators for the founding of the Zemgale Museum society, which aimed to create a museum in Jelgava to promote the work of Latvian artists. In 1939, Baltgailis organised a solo exhibition in Jelgava, marking the 25-year anniversary of his creative activities. The goal of the research is to examine Kārlis Baltgailis' contribution to Latvia's artistic life in the interwar period and outline his activities in Jelgava, which in the 20s and 30s could claim to be the second major cultural centre in Latvia.

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CONTEMPORARY ART EXHIBITION RHETORIC: THE CASE OF DAUGAVPILS MARK ROTHKO ART CENTRE

Key words: *contemporary art, exhibition management, exhibition rhetoric, art centre*

Renewal of Latvia's independence came with fundamental shifts in the country's political and socio-economic systems as well as in art. The 1990s saw the emergence of new institutions that altered cultural organisations to the core, a change way more profound than mere fine-tuning of management models and functions. The emergence of creative industries, new media and technologies diversified exhibition spaces and projects and boosted contemporary art. A highlight of 2013 was one of the 21st century's most ambitious cultural projects in Eastern Europe – Daugavpils experienced the opening of a new contemporary art centre named after Mark Rothko, the father of abstract expressionism. From the word go, the aspirations of Daugavpils Mark Rothko Art Centre went beyond displaying the work of the world-renowned artist to include facilitation of new and unique cultural products and services. Eight years into existence, the centre has implemented more than three hundred exhibition projects in various media, a substantial segment for research and analysis. Essentially, robust analysis of contemporary exhibition projects goes beyond examining the basic management principles for culture and art (discover, evaluate, develop, fulfil). A more comprehensive perspective also requires tracing the impact of the art institution in question on the development tendencies of artists' creative outputs and broader artistic processes.

The study aims to analyse the management of contemporary art exhibitions in Daugavpils Mark Rothko Art Centre by establishing its basic principles regarding the making of artistic content. The analysis will involve describing the rhetoric of the implemented art projects and reviewing their impact on the development of artistic processes on regional, national and international levels.

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DIZAINS KĀ METODE POLICIJAS TĒLA DEFINĒŠANĀ

Policijas tēla aizsākumi tiek veidoti vidē, kurā aug un ikdienā uzturas bērns. Pirmo iespaidu par policiju bērni gūst no vecākiem, kas nereti policijas tēlu izmanto bērna iebiedēšanai nepaklausīšanas gadījumā; vēlāk – mācību iestādēs, ja skolotājs nespēj tikt galā ar situāciju; un visbeidzot – pusaudžu vecumā, kad daļa jauniešu gūst pirmo personīgo pieredzi. Liela nozīme ir arī digitālai videi, īpaši tagad, kad valstī un pasaulē esošā epidemioloģiskā situācija ierobežo ierasto dienas gaitu un ieradumus. Skolēni apgūst mācību programmu attālināti, pavadot daudz laika pie datora. Izkontrolēt saturu, kas paralēli mācībām tiek apskatīts tieklī, praktiski nav iespējams, īpaši, ja runājam par bērniem vecumā no 12 līdz 17 gadiem, kas ir pētījuma fokusa grupa.

Sociālie tīkli ir plašsaziņas rīks, kas nodrošina ne tikai savstarpējas saziņas un informācijas apmaiņas iespēju, bet ar to starpniecību sabiedrība tiek arī informēta par valsti un pasaulē notiekošo, savukārt veids, kā tiek pasniegta informācija, var veidot labvēlīgu vai naidīgu sabiedrības viedokli. Vienlaikus sociālo tīklu lietotāji var brīvi paust savu viedokli un situācijas interpretāciju komentāru sadaļā. Līdz ar to var apgalvot, ka policijas tēlu pusaudžu vidū veido vismaz divi komponenti: 1. pirmais iespaids, kas gūts no vecākiem un vecvecākiem un iekļauj stereotipus, kas nāk no pagājušā gadsimta 90. gadiem un ietver korupciju, zemu produktivitāti, ļaunprātīgu dienesta stāvokļa izmantošanu, kā arī vardarbīgas izpausmes pret pārkāpējiem un aizturētām personām; 2. mediju tēls – informācija par policijas darbību un sasniegtajiem rezultātiem, kas tiek publicēta sociālajos tīklos un masu medijos. Savukārt sabiedrības daļas, tostarp pētījuma fokusa grupas, attieksme ir vērojama komentāru sadaļā. Referāts tiks veltīts policijas tēla izpētei un dizaina potenciālai lomai definētas sociālās problēmas risināšanā.

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GRAPHIC DESIGN OF BOOKS IN THE LATGALIAN LANGUAGE

Key words: *graphic design, visual design of books, content and form of the book, art of books, creation elements of books*

Nowadays in the age of globalization and technology, it is very important to preserve the languages and traditions of the ancient people. The Latgalian language is the cultural and historical heritage of Latvia, which has been developed and passed down from generation to generation by our ancestors. Part of this heritage has survived to this day as well. The mother tongue for Latgalians is of great importance, through which the identity of the people is expressing. According to statistics, in 2011 8.8% of the population in Latvia use the Latgalian language every day. In Latgale region 35.5% of the population. The language has been preserved because of communication of people. People communicating with each other language. Reading and writing skills were not previously taught in schools. The authors of the books publish their written books themselves, personally financing the publishing costs of the books. Edition volumes are not big. In order to attract people's interest and give individuality to the book, visual image, design and presentation are important.

Today, when the use and development of the Latgalian language is topical, a lot of resources and work are invested in the preservation of the Latgalian language. Computer games, books, lessons are created, teachers are trained, written language is mastered, teaching methods and tools for learning Latgalian written language in schools are developed.

There is a need for books whose visual image and content attract people to learn their mother tongue. It must be found for the book a high-quality artistic solution.

Aim of the research: To study the principles of book development and graphic design. To develop sketches for book design.

Research methods: Analysis and research of books, literature, internet resources, analysis of analogues.

Valentina Sinakova, Aina Strode

GRAPHIC DESIGN OF COOKBOOKS BY ANTONINA MASILUNE

In Latvia, Antonina Masilune (1921–2019) is known as the author of food recipes. In 80s–90s of the last century, when cookbooks were popular in households, especially the older generation preferred the recipe books by A. Masilune – a culinary born in Latgale. In total, five cookbooks were published during her lifetime. This is a great investment in the field of intangible cultural heritage of the Latvian people, because A. Masilune paid attention to the promotion of both the preparation of Latvian national dishes and the use of products corresponding to Latvian conditions. The first book “For Everyday and Festive Table” was published in 1982. As known, the possibilities of graphic design and printing of books at that time were technologically limited. A period of almost 40 years has also made this publication a bibliographic rarity. This determined the need to get acquainted with the recipe books published by A. Masilune, with the aim to popularize the culinary heritage by developing a new graphic design of the first book.

The aim of the research: to study the graphic design of A.Masilune’s cookbooks, to summarize the modern tendencies of book design, which will be used in the graphic design concept of A.Masilune’s renewed first book.

Research methods: theoretical – analysis of literature and Internet resources, empirical – case studies, analogue research.

Results: The role of graphic design in the layout of cookbooks is very important. Here is formed a combination of different components, from which arises informative, entertaining and attention-grabbing visual and textual communication with the reader.

Silvija Ozola

INNOVATIVE TRANSFORMATIONS OF URBAN SPACE FOR SUSTAINABILITY, STRENGTHENING CULTURAL IDENTITY AND TRADITIONS IN LATVIAN CITIES

Latvian urban spaces preserve the cultural and historical values of previous generations and reflect views, traditions, and understanding of living spaces. It is important for people to adapt the historical environment to new everyday functions and complement it with modern architectural accents that ensure sustainable development, strengthen cultural traditions, and promote economic activities and well-being. Innovative urban transformation not only preserves the identity of the urban environment but also enables local communities to find opportunities to integrate into the global economy. This study analyzes the impact of innovative urban transformations on the economic growth and well-being of local people.

Aims of paper: Analyzing innovative transformations of the environment in historical urban space in different cultural regions of Latvia and the impact on the preservation of identity.

Methodology: An analysis of cartographic materials, urban planning projects, published information, photo fixations is conducted.

Research problem: identification of values created by previous generations and preservation of identity by performing transformations of urban space in ethnographic regions of Latvia.

Findings: Regional differences, interpretations, and novelties in solutions for improving the environment of historical cities, and the functionality of public outdoor spaces, urban identity, artistic, and landscape values in the historical environment must be considered.

Practical implications: The findings would help to find successful solutions for quality improvement of urban spaces and promote the people’s economic activities.

Social implications: Tradition-based sustainable environmental improvements have a direct impact on the health and quality of life in society.

Originality: This study discusses the peculiarity of innovative transformations of Latvian urban space and differences under the influence of local cultural traditions.

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INTERACTIVE PROJECTION MAPPING IMPACT ON DEVELOPMENT AND SUSTAINABILITY OF ARTS

Key words: *art, projection mapping, sustainability, interactive*

Recent progress in video projection techniques leads people in finding new possibilities in expressing creativity. Projection mapping is one of the latest techniques used to demonstrate art-made performances on any surface turning it into a dynamic display. The aim is to enliven traditional art with video-audio elements to create an illusion of physical interaction between the surface and the viewer. Newly this trend is being used in architecture and historical structures in public places presenting awaken art or animated actions of the object or related events. This has become an outstanding way to reach a wider audience to appreciate the historical heritage and art itself.

In the 70s artists searched for new methods to communicate with their audience. Since the development and integration of computers and technology into daily life, artists have been experimenting with various media in the art process. Interactive installations with digital animations and related software engineering can be considered under the framework of art sustainability. This art form has become a collaboration of arts, science, and technologies. Projections have been emerging as an important instrument for presentation and communication for all audiences distinctively.

The goal of the research: to explore the project mapping impact on art development and sustainability.

Methods of the research: theoretical: studying and exploring the literature and the internet resources of a topic, empirical: analyzing analog in similar fields, qualitative and non-experimental: creating a survey to understand people interest in the topic

Results: Understand the impact of technology development on art installations – creating interactive performances with projection mapping. Emphasize the need for digitalization to maintain arts sustainability.

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KĀ APSKATĪT Telpas Interjera Dizaina vērtības

Referātā autore sniedz ieskatu pašizstrādātā vienotu jautājumu sistēmā, kas paredzēta jebkuras iekštelpas vērtības plānveidīgai apskatei un izzināšanai. Sistēma izveidota pedagoģiskā darba vajadzībām, ar šiem jautājumiem topošie interjera dizaineri tika mudināti izanalizēt konkrētu mūsdienu interjera dizaina paraugu dotās kvalitātes, radot pakāpenisku izziņas ceļu un ļaujot nonākt pie visaptverošiem secinājumiem. Šie jautājumi ir izmantojami, lai vispusīgi un profesionāli secīgi izanalizētu visus galvenos interjera dizainu noteicošos faktoros katra gadījuma apskatā, tas tiek referātā uzskatāmi ar piemēriem parādīts.

Visi 15 jautājumi apvienoti trijos blokos, pirmais no tiem sākas ar objekta īsu aprakstu, vispirms nosakot, kas tas ir par arhitektūras objektu, kur tas atrodas, kam tas domāts, kad tas radīts, kas ir tā īpašnieki, autori, realizētāji, attēlotāji. Tālāk tiek vērtēts emocionālais iespaids, ko rada interjers, jo tieši emocionālais iespaids ir vissvarīgākais ikvienas iekštelpas pirmreizējā uztverē, tas rada mūsu sasaisti ar šo telpu. Tad tiek izvirzīti tie aspekti, kas to vispirms veido – krāsu un apgaismojuma jautājumi, kas ir cieši saistīti, tad kompozīcijas paņēmieni, kas noskaņu pastiprina.

Otrais jautājumu bloks attiecas uz interjera telpisko uzbūvi, to ievada apskatāmās telpas izvietojuma vieta, lielums, plānojums, funkcijas, kustību ceļi, apjaušot, kas ir tā lietotāji, to daudzums un kādas to vajadzības, neaizmirstot pieminēt, vai interjerā ir iekļaujošais dizains, kāds ir vides pieejamības risinājums. Turpmāk analizējot sienas, grīdas, griestus – to materiālus, uzbūvi, apdari un interjera uzbūves detaļas – ailas, durvis, aplodas, logus, palodzes, kāpnes, u.c.

Trešajā jautājumu blokā paredzēts stāstīt par mēbelēm un citiem iekārtas priekšmetiem, atkritumu aprites organizēšanu, interjera ilglaicīgumu, tiek skatīts vai ir papildu dekorējums. Nobeigumā vaicājums, kā varētu raksturot interjera stila piederību un noteikt tā novitāti.

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MAKING LATVIAN MYTHOLOGICAL CHARACTERS TOPICAL IN CONTEMPORARY CULTURAL EVENTS

Key words: *mythological characters, cultural events, cultural policy*

Aim of the research is to make contemporary cultural events that represent Latvian mythology and cultural policy topical.

Latvian culture is identified by its folklore. Characters of Latvian folklore recognized as a reflection of this ethnocultural world express social and cultural identity of our nation. This highlights our difference from other nations, reveals our uniqueness. Since childhood and in schools we have been taught and told about Laima, Mothers of Forest, Wind, and Sun, about Jumis, Lietuvēns, Witches, Auseklis, Veļi, and others. Characters of our folklore are made topical and reminded of at annual festivals, and the ones doing it are folklore groups, collectives whose daily life is connected with storage or collection of folklore. However, folklore is a collective work, created not by one, but many people, therefore it is a shared responsibility to pass it on to future generations and preserve its identity.

But how can we actually preserve, cultivate, and pass on this unique part of folklore to future generations? How have folklore characters been integrated into cultural events in the last decade? Are large cultural events being planned based on characters of Latvian folklore? What is the trend in cultural activities today? Have characters of folklore been interpreted in postmodern folklorism in new forms, situations, and contexts? Do other types of pop culture images not suppress our own values and despise our folklore characters?

In Latvian culture, annual festivals like Midsummer, Christmas, Easter are a strong tradition, but late autumn is the silent time of the souls of dead people. How topical are these traditions today and at cultural events?

Are characters of our folklore taken into account when elaborating cultural policy in the regions of Latvia?

The report will be based on a survey conducted by culture institutions of Latvia on cultural events and the importance of using characters of folklore in elaboration of cultural policy.

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PRESENTING THE THREATS AND CONSEQUENCES OF CLIMATE CHANGE IN CONTEMPORARY ART

Key words: *art and climate change, artists and art organizations, contemporary art*

Although climate change is very real, it can also be described as abstract, just like works of art. We know that they are changing the world around us, but it is difficult for us to understand the changes in weather and their impact on the planet and society. And yet most people do not even talk about it, and even less – doing something about it.

Art can also lead to regenerative change having a positive impact on the planet and culture. These changes begin in our art institutions where they enter the art through artists, but through art – the society where it becomes culture.

Artists and art organizations are perhaps some of the most influential change makers in the world since artists are the ones who are increasingly trying to use their works to talk about indifference towards climate change, to visualize the consequences and threats of this change in their works. Their goal is to create a strong voice of art to call for immediate, effective and creative action to ensure secure future for humanity and all life on Earth.

Art can not only show, but it can also make us feel the challenges we face, and it has an important role in fostering transformative thinking needed to move us away from our current destructive practices and head towards environmental sustainability necessary to protect life on our planet.

Aim of this study is to examine presentation of climate change in contemporary art, as well as to learn more about artists and art organizations that use contemporary art as a tool to talk about climate change on the planet.

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SADZĪVES ŽANRA INTERPRETĀCIJAS DAUDZVEIDĪBA 20. GS. PIRMĀS PUSES LATVIEŠU GLEZNICĪBĀ

Atslēgvārdi: *sadzīves žanrs, glezniecība, Jēkabs Bīne*

Konferenci pieteiktā tēma paredz apskatīt sadzīves žanra daudzveidību un interpretācijas iespējas 20. gs. pirmās puses latviešu glezniecībā. Pētījumā tiks atklātas šim žanram raksturīgākās iezīmes attiecīgajā periodā un to veidošanās procesu, kā arī izsekot atsevišķu mākslinieku darbībai šajā periodā, koncentrējoties uz žanra glezniecības attīstības iezīmēm to darbos. 20. gadsimta 20.–30. gadu periodā, bija sākusies iepriekš nedaudz piemirstā lauku dzīvei veltītā sadzīves žanra attīstība. Pamatā tas saistījās ar nepieciešamību aktualizēt latviešu mākslas nacionālo savdabību, vietējiem māksliniekiem arvien biežāk piedaloties ārvalstu izstādēs. Īpaša uzmanība pievērsta mākslinieka Jēkaba Bīnes (1895–1955) sadzīves žanra kontekstam kopējā daiļradē, tās tematiskai daudzveidībai un iespējamai saistībai ar politisko varu un apstākļu diktētajiem noteikumiem.

Sadzīves žanra glezniecība skaitliski Jēkaba Bīnes daiļradē ir pārstāvēta visplašāk. Šī žanra darbos mākslinieks centies līdzsvarot bezproblēmu omulību ar noskaņas vēstījumu, personāžu raksturu un apkārtējās vides izjustu tēlojumu. Tomēr, jau pāris gadus vēlāk 40. gadu vidū vairākās gleznās, iespējams, ir ierakstīta klusināta un biedējoša sava laika apzinātā traģēdija. Var tikai interpretēt, ko gleznotājs patiesībā domājis, sajūtot iekšējo pretestību notiekošajam, neizpratni vai bailes, un ļaudams to paust atklāti vienīgi krāsu un toņu noskaņai. Padomju gados tapušie darbi atbilst tobrīd valdošā socreālisma prasībām, tajos uz skatītāju veras smaidoši un monumentalizēti darba darītāji. Bīnes glezniecības stils atbilst tā laika prasībām, jo reālisms tiek atzīts. Māksliniekam tikai jāspēj savos Darbos mainīt saturu un ideoloģijas izpratni.

Iveta Feldmane

THE CONCEPT OF BODY IN THE PORTRAITS OF ILMARS BLUMBERGS

Key words: *affect, corporeality, body, self-portrait, Ilmārs Blumbergs*

The paper is based on the Author's doctoral research, which is focused on the semantics of the human figure and corporeality in Latvian art in the late soviet and post-soviet period. Until now, the representation of the human figure in its bodily expression has been studied by Latvian art historians mainly by applying formal research methods, where the body and its representation are viewed as an aesthetic category with diverse iconography. Over the last three decades, the theoretical approach has been related to the problem of figure's individualisation and typology in the genre of portraiture, as well as to the social and ideological context of the particular artwork. It can be agreed the portrait painting undeniably requires the extensive and profound inquiry of the individual, but a portrait or

self-portrait is only one of the ways to articulate a person as an individual in art. Latvian contemporary art has been manifesting itself in non-traditional media and articulating a new artistic language since the mid-1980s, in some cases at least a decade earlier. The human representation in Latvian contemporary art transcends the boundaries of formal research, because the object of research itself – the human body – begins to perform another function in the work of art. From a mere object of representation it becomes a sign or the material for conceptual message, existential ideas and personal, often exaggerated and intimate bodily experiences. How to define the concept of body and corporeality in Latvian art? Is Latvian art bodily at all? In order to substantiate the topic of corporeality in Latvian art, the author offers an insight into the concept of the body – conceptualized by painter, graphic artist and scenographer Ilmārs Blumbergs (1943–2016). On the one hand, Blumbergs thematized the body as his intimate space affected by mortality; on the other hand, he treats the body as an absolute stable form. Author aims at offering a discursive and theoretical interpretation of this topic.

Katriona Luīze Rožlapa

THE RUSSIAN NORTH ARCHITECTURE AESTHETIC ADAPTATION IN LATGALE

In the second half of 19th century in Russian Empire, after a major impact by the Slavophilism movement, Russian style flourished in the architectural scene, as a reminiscence and glorification of the Russian historical artistic aesthetics and ethnographical wooden architecture.

After finishing studies at the Department of Architecture of the Riga Polytechnic Institute and the successfully lead reconstruction works of the iconostasis of Saint Alexei monastery, architect Vladimir Shervinsky (1894–1975) received an invitation from Archbishop Jānis Pommers (1876–1934) to become the Synod architect of the Latvian Orthodox church.

Being in the position of the architect of Synod, Shervinsky was eager to create designs for new churches, as well as to participate in the completion of previously started new construction works, which were suspended due to war, and he led the restoration works.

During the years of independent Latvia, more than 20 new Orthodox churches and prayer houses of Old Believers were built after designs of Shervinsky, shaping this period as the second significant upswing of the new construction of Orthodox churches in Latvia after the Russification policy of the second half of the 19th century.

Shervinsky fulfilled his theoretical concept of the adaption of traditional Russian Northern ethnographic wooden architecture and transferring its decorative aesthetics to the cultural environment of the Orthodox Church in the eastern part of Latvia. Impetus for his inclination is found in the architect's emotional attitude towards the atheist policy pursued by Soviet Russia as they initiated demolition works of many holy places, together with his deep professional interest in the examples of the Russian North and the expressive decorative constructions of the so-called Narishkin Baroque.

The designs of Vladimir Shervinsky are comparable to the Russian style and Neo-Russian style aesthetics that is a peculiar approach in the architectural scene of Latvia.

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TRENDS IN LATVIAN CONTEMPORARY ART: EXAMPLES OF SOCIO-POLITICAL CRITICISM FROM 1980–2020

The relevance of the subject matter is dictated by the fact that Latvia still does not have its own contemporary art museum and information about current processes in today's visual art is fragmentary. The collections of the Latvian National Art Museum and the future Latvian Museum of Contemporary Art will serve as the basis for the analysis of the subject matter.

In the context of contemporary art research, the problem of its classification is often emphasised. Whereas modernist art is defined with the help of its so-called “-isms” (e.g. surrealism), which usually denote artists' groups united by style, ideology, social and professional links, the complexity and dynamism of the development of contemporary art dictates that critics and art theoreticians describe it in broader thematic and conceptual extrapolations, which they try to define and describe. Whereas in modernist art, an important approach to analysing art was research into specific media and approaches, as well as traditional aesthetic language (e.g. colour, composition), in contemporary art this body of approaches to the interpretation of art is no longer adequate. New theoretical methods are required that would make it possible to describe and systematize contemporary art. In Latvian contemporary art, little research has been conducted into such trends.

In discussion among Latvian art professionals, one often hears about the movement of Latvian contemporary art towards the highlighting of aesthetic and poetic as opposed to socio-political categories, compared, for example, with neighbouring countries or the Eastern European region. The objective of the study is to define the socio-political structure of Latvian contemporary art criticism and to demonstrate by means of examples that Latvian contemporary artists are translators and intermediaries of society's problems including race and gender equality, civil rights, sexual politics, cultural and social identity, as well as globalization. They reflect on these subjects, facilitating our understanding of the world we live in. Examples of this in our contemporary art can be found in the works of Kristaps Ģelzis, Andris Breže, Ojārs Pētersons, Juris Utāns, Mētra Saberova, Frančeska Kirke, Andrejs Prigičevs, Līga Spunde, Ēriks Bozis and other artists.

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CRISIS MANAGEMENT: POSSIBILITIES FOR THE IMPLEMENTATION OF THE CULTURAL PROJECT “DAUGAVPILS UNIVERSITY HISTORY NOW”

Key words: crisis management, cultural project, performance, exhibition, Daugavpils University history

Cultural management combines both the manager's artistic/cultural competencies and his organizational skills with creative activity in promoting cultural development in any circumstances, even during an unforeseen crisis. Such situations determine a larger investment of time, resources and diversity of communication, require technologically creative solutions, innovative experiments and original ideas in the implementation of a cultural project.

A professional cultural manager must be flexible and have thinking in the context of specific situations, providing a “platform” for the development of culture both in the face of unexpected crisis and in terms of the future perspective. There are opportunities in every crisis.

The aim of the research is to theoretically study crisis management strategies and experiences in the cultural environment, to develop a concept and implementation plan for the cultural project “DAUGAVPILS UNIVERSITY HISTORY NOW”, including the exhibition and performance as the dominant art events.

BIOLOĢIJA

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BIOLOGY

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APPLICATION OF GENETIC NON-INVASIVE SAMPLING FOR FISH GENETIC STUDY

Genetic non-invasive sampling (gNIS) plays an important role in preserving biodiversity and population genetic research, especially for endangered species because it is not harming the animals in the process. This method may provide valuable information for population monitoring, as it allows inferences of population density and key behavioral traits such as dispersal, kinship and reproduction. But non-invasive collection methods suffer from low DNA yields, quality. Molecular biology and genetic laboratory of DU has used different gNIS methods for population genetic studies: DNA extraction from scales, buccal swabs, and others.

In this investigation we used the fins of European eel (*Anguilla anguilla*).

In process of evaluating non-invasive DNA sampling methods, three different DNA extraction methods were used to compare their effectiveness and overall application: DNA phenol-chloroform method, which helps removing the unnecessary proteins from the DNA solution, the salt-out method, which was adapted to be used with harder tissue, increasing the incubation time to allow better DNA extraction and the QIAGEN Spin column protocol which is essentially matrix based DNA isolation. DNA was quantified spectrophotometrically at OD_{260}/OD_{280} , OD_{260}/OD_{230} and quality checked by electrophoresis using the 1% agarose gel. Successful DNA extraction was achieved by all the methods and further checked for viability to be used for mtDNA analysis and proved to be PCR inhibitor free. The successful DNA amplification was performed using *Ang1* and *Ang2* primers of mtDNA. The PCR products were separated in 2% agarose gel.

The most effective method turned out to be salting out as it showed higher DNA concentration yield and DNA purity. This shows that genetic non-invasive sampling methods are effective and necessary working with endangered species or any species for that matter as they can successfully reach the needed results without endangering the target species.

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REVISION OF K. SZAFNAGEL'S HISTORICAL DATA ON THE DISTRIBUTION OF MIRE SPECIES

Historical data of mire bryoflora are important for assessing the impact of anthropogenic activity on the structure of bryoflora of the habitats and can answer a wide range of research questions in future investigations.

Botanist K. Szafnagel is known for the book of botanical studies "Zapiski bryologiczne" (1908). He has presented the results of bryological investigations in seven regions, which recently are in Belarus, Lithuania, Poland and Ukraine. More than 25% among about 240 bryophyte species recorded in the book are characteristic species of mire habitats. Recently discovered K. Szafnagel's collection at the

Herbarium of Vilnius University provided an opportunity to review species listed in “Zapiski bryologiczne”. The study covered more than 150 herbarium specimens collected in mire habitats. Following the revision, about 80% of mire species were confirmed by herbarium specimens. However, more than 50 specimens were re-determined. So, we found no specimens available to confirm 12 mire species provided in the book (e.g. *Brachythecium mildeanum* (Schimp.) Schimp., *Palustriella decipiens* (De Not.) Ochyra, *Scorpidium revolvens* (Sw. ex anon.) Rubers.). Nevertheless, the collection of K. Szafnagel remains a significant source of evidence for the occurrence of rare mire bryophyte species in Europe. It provides data on the species of the European Habitat Directive Annex 2 (*Hamatocaulis vernicosus* (Hedw.) Hedenäs,) (Council of the European Communities, 1992) and species Red-listed in many countries of Europe (*Catoscopium nigratum* (Hedw.) Brid., *Drepanocladus lycopodioides* (Brid.) Warnst., *Meesia triquetra* (L. ex Jolycl.) Ångstr., *M. uliginosa* Hedw.) (Hodgetts, 2015). This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-LIP-19-62.

References

- Council Directive of the European Communities. 1992. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of fauna and flora. – *Official Journal of the European Community*, L 206: 7–50.
- Hodgetts, N.G. 2015. Checklist and country status of European bryophytes – towards a new Red List for Europe. – *Irish Wildlife Manuals*, 84.
- Szafnagel, K. 1908. Zapiski bryologiczne. – Wilno.

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APPLIED BRYOTECHNOLOGY

Bryophytes are the second-largest group of plants on the world. However, there is no major economic use of moss, except peat. A literature analysis has been carried out to understand whether moss can be used in the economy. Moss substances have antifungal and antimicrobial activity. Bryophytes are used also as indicator species, erosion control, bioindicators of heavy metals in air pollution, aquatic bioindicators, radioactivity indicators, and others. Environmental quality is increasingly accentuated in all areas of biology. The role of bryophytes as bioindicators is therefore considerable. One Patent has been obtained to cure fungal infections of horses with bryophyte extract. This same extract shows antifeedant effects against slugs. Lots of unexplored opportunities show literature studies.

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DATA ON RARE INSECT SPECIES FOUND IN LITHUANIA IN 2020 USING A HEADLAMP

The use of light at night is a common practice in insect research. Insects observation at night with head lamp is being discussed here. Walking around insect habitats at night with a headlamp and observing various plants can be very successful in insect research, eligible to species who do not come to light traps. Some of insects feed on, migrate or are active as predators predominantly at night. A larvae of some species appears on surfaces of leaves or on tip of branches at night. With the help of lighting, you can easily see the larvae or adults sitting on flowers, bushes, etc. When exploring open and forest habitats at night in 2020, we discovered interesting species of insects that are not visible during the day. When lighting the bushes of *Salix rosmarinifolia* at night, we observed about 20 individuals of a very rare species *Filatima ukrainica* Piskunov, 1971 (Lepidoptera, Gelechiidae) flying around them. Six specimens of *Euroleon nostras* (Fourcroy, 1785) (Neuroptera, Myrmeleontidae) were observed in

Curonian spit at the edge of pine forest. Six specimens of rare grasshopper *Podisma pedestris* Linnaeus, 1764 (Orthoptera, Acrididae) (Lithuanian Red Data Book) were observed on the tip of *Calluna vulgaris* in Rūdinkai biosphere polygon. Three specimens of *Barbitistes constrictus* Brunner von Wattenwyl, 1878 (Orthoptera Phaneropteridae) were observed on *Salix* sp. bushes in Pirčiupiai forest. Three nymphs and five adults of *Mantis religiosa* (Linnaeus, 1758) (Mantodea, Mantidae) were observed in Rūdinkai biosphere polygon at 15 08 2020, 25 adult mantis were found in Perloja at 17 08 2020, 20 08 2020 and 22 08 2020, all on *Calluna vulgaris* and *Sarothamnus scoparius*. *Carabus coriaceus* Linnaeus, 1758 (Coleoptera, Carabidae) (10 spec.) (Lithuanian Red Data Book) were observed in 60–80 year age pine forest on its pathway, and *Ergates faber* Linnaeus, 1761 (Coleoptera, Cerambycidae) (4 spec. and 3 pairs of elytra) (Lithuanian Red Data Book) were found in the same forest on quarter line.

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DEVELOPMENT OF POTENTIAL OXIDATIVE STRESS RELATED BIOMARKERS FOR MULTIPLE SCLEROSIS

Previous studies indicate various possible reasons for multiple sclerosis (MS). DNA damage and products of lipid peroxidation are some of the most potent biomarkers for oxidative stress. Overproduction of nitric oxide synthases (NOS) is associated with many disorders, including inflammation and MS. The most potent way to detect NOS activity is by evaluating levels of nitrites and nitrates in physiological fluids. Some studies also correlate MS with polymorphisms in ATM, PARP1, XPC, XPA, and XRCC1 genes.

This study aimed to evaluate different potential biomarkers in whole blood, plasma, and serum of patients with MS.

25 randomly selected patients with MS and 25 healthy subjects were chosen for this study. Nitrates and nitrites were analysed by chemiluminescence on Sievers NOA 280i in plasma and serum samples. Enzymatic alkaline comet assay was performed on isolated PBMNC samples. Levels of MDA were measured with TBARS assay. Polymorphisms were evaluated by genotyping ATM, PARP1, XPC, XPA, and XRCC1 genes of 96 patients, including 25 patients from the initial selection.

Patients with MS had a significant increase in nitrate, nitrite, and MDA concentrations in plasma and serum. Single-strand DNA breaks evaluated by conventional and enzymatic comet assay were higher in isolated PBMNCs of patients with MS. On the other hand, genotyping results have shown a typical polymorphism pattern compared to the European population. Few correlations between genotype and other parameters were also observed. One-way ANOVA statistical analysis was performed after each experiment, and statistical significance ($p < 0.05$) was proved.

This work was supported by the European Regional Development Fund project No. 1.1.1.1/16/A/016; UL research project "Research of biomarkers and natural substances for acute and chronic diseases' diagnostics and personalized treatment".

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DO NATURA2000 SITES PLAY A KEY ROLE IN THE PROTECTION OF EC 92/43 FISH SPECIES IN LATVIA?

Protected Nature territories are one of tools for preserving natural values of a territory. In the Europe 18% of land surface with its waters is included in Natura2000, while in Latvia it is 12%. Surface area of freshwater habitats only known for lakes. That is why fish occurrence and distribution is assessed relatively as presence in the waterbody.

Fourteen fish species included in the EEC 92/43 are present in Latvia. Of these, 10 species occur in regularly but some of them (ziege Pelecus cultryatus, twite shad Alosa fallax) have been identified only as bycatch in commercial fisheries, or acclimatized from different sources (whitefish Coregonus spp.). Some of them occur only in rivers, such as salmon Salmo salar, grayling Thymallus thymallus, river lamprey Lampetra fluviatilis, brook lamprey Lampetra planeri, or only in lakes like vendace Coregonus albula.

Fish monitoring data based on GIS processing data of species analyzed in relation of their presence within and outside of the Natura2000 territories. Sampling data represents 457 the lentic (riverine) 379 lithic (lakes, reservoirs) habitats, were fish sampling carried out respectively 2180 and 379 times. Statistical significance assessed with X² test at p<0, 05.

Species such as bullhead Cottus gobio, salmon, grayling and vendace have been identified more frequently in Natura2000 areas, more likely these differences are determined by higher sampling effort. Brook lamprey and pond loach Misgurnus fossilis are more frequently identified outside them, indicating the steady distribution of these species in the territory of Latvia. More often grayling is represented in the rivers flowing through the Natura2000 territories, while a brook lamprey – outside of them. Largest part of EC92/43 fish species are widespread, protecting them does not play a crucial role for Natura 2000 sites.

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EFFECT OF FE₃O₄ NANOPARTICLES ON VARIOUS LATVIAN ORIGIN BARLEY (HORDEUM VULGARE L.) VARIETIES WITH DIFFERENT GENETIC BACKGROUND AGAINST POWDERY MILDEW UNDER HIDROPONIC CONDITION

Presently, nanotechnology opens a great possibility of novel application in the fields of biotechnology and agricultural industries, as far as nanoparticles (NPs) have unique physicochemical properties, whereas research in the field of plant nanobiotechnology has a great potential for practical application in obtaining new genotypes for breeding purposes.

Cereals is known to be the most relevant food component since they have high carbohydrate content, provide vitamins, trace minerals, dietary fiber and bioactive compounds. Barley (*Hordeum vulgare* L.) is among the major cereals grown in all over the world including Latvia. It has a high economic value and is used in food and industry, such as the beer industry, malting, and animal feed.

The aim of the research was to develop and approbate the innovative methodological approach based on using of Fe₃O₄ NPs for expression of resistance-related molecules in different Latvian origin barley genotypes 'Quench' (presence of mlo 11), 'Sencis' (presence of mla 13) and 'Abava' (lack of resistance genes) against barley powdery mildew *in vivo*. For this purpose, Fe₃O₄ NPs concentrations of 1 mg/L, 10 mg/L and 20 mg/L were used as well as comet assay, confocal laser scanning microscopy and

RT-qPCR were applied. Barley seedlings were grown in hydroponic conditions with addition of NPs for 2 weeks.

The obtained results demonstrate the possibility of utilization Fe₃O₄ NPs for breeding of barley, increasing of amount of resistance related molecules and utilization Fe₃O₄ NPs for the regulation of plant resistance associated molecules by blocking of microRNAs. The future research of barley grown in the field conditions is needed to verify Fe₃O₄NP capability to increase barley crop productivity, quality and to improve crop breeding and conservation strategies.

This study was supported by Daugavpils University internal grant No. 14-95/2021/8.

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EFFECT OF SEED TREATMENT WITH MOLLUSK MUCUS ON SEED GERMINATION AND GROWTH OF SEEDLINGS IN SWEET PEPPER

The development of new methods of crop production is the most promising field of research in agriculture. There are numerous chemical techniques of seed treatment before sowing; however, mollusc mucus had not been considered as a natural alternative of seed treatment yet. The mollusc mucus may be used as a beneficial treatment before sowing to improve germination or seedling growth. In this study, we have treated sweet pepper seeds with *Arion vulgaris* and *Achatina fulica* mucus before sowing. Seed germination success and growth rate, as well as a performance of seedling growth were compared between experimental and control groups. Chromate-mass spectra studies were carried out to determine the biochemical composition of mollusk mucus. The main result showed that seeds treated with slug mucus require significantly fewer days to germinate than seeds without treatment. Although treated seeds exhibit faster germination, seedlings showed slower growth rate than the control group. The difference of seeds germination success between control and experimental group was not recorded.

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GENETIC DIVERSITY IN MEMBRANE STABILITY AND TOLERANCE TO THE WATERLOGGING STRESS IN WINTER WHEAT VARIETIES

Wheat plants are very sensitive to waterlogging stress and suffers from hypoxia and anoxia, intoxication, oxidative stress, root dysfunction, water and nutrient deficiencies, respiratory depression and photosynthesis depression, and finally limited the quantity and quality of the crop. Waterlogging tolerance is a complex trait, but wheat varieties have some genetic diversity. Tolerant wheat genotypes can adapt to waterlogging by developing a mechanism related to morphology and metabolism, to combat unfavourable environments and survive for perspective regrowth. One of these mechanisms is a protection the membranes: enhancing antioxidant system activity and scavenging reactive oxygen species – protection membranes from lipid peroxidation process.

The aim of our investigations was to study genetic diversity of some Latvian wheat varieties, based 21 microsatellites loci, and associated with such characters: membrane stability, chlorophyll content, stay-green trait, seedling biomass, roots length and weight, grain yield; heat, salt and drought stress tolerance. The experiment was carried in the climatic chambers under controlled conditions. Soil

environment for experimental group of 7-days seedlings were flooded during 7 days. First leaf of seedlings of five wheat varieties were used for measurements. PCR reaction products were analysed by electrophoresis in 1,5% agarose gel and obtained results were compared with a biochemical characteristics of membrane stability: electrolyte leakage and malondialdehyde concentration (MDA). We found significant differences between five wheat varieties on six microsatellites loci. All the experimental plants showed arising of MDA concentration and electrolyte leakage elevation under the stress. But, wheat cultivars Fredis, Edvins and Brencis had the smallest changes in MDA concentration and membrane injury index. We are expecting that these varieties should be more tolerant to the waterlogging stress. Wheat cultivars Brencis, Edvins and Fredis have a potential to protect membranes from oxidative stress and lipid peroxidation, and to survive in extremely watered soils.

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GIS-MODELLING OF THE RANGE SHIFTS OF THE EUROPEAN POND TURTLE (*EMYS ORBICULARIS*) IN EASTERN EUROPE IN THE HOLOCENE

After the glaciers' melting in the early Holocene, the European pond turtle *Emys orbicularis* experienced a rapid expansion of its range, and there are also findings of subfossil records of *E. orbicularis* in the Northern and Baltic seas, including the United Kingdom, Baltic countries, Sweden, Finland, Belarus, and Russia. The expansion of the *E. orbicularis* range coincided with the Holocene climatic optimum about 10,100–5700 years ago.

The study of the dynamics of the *E. orbicularis* range and distribution as an indicator of climate change in the past, present, and future is most relevant in connection with the protected status of this species in Europe. Based on our original finds, 25 archaeological sites yielding 1623 remains of 1504 individuals of subfossil *E. orbicularis*, current marginal distribution in Latvia, Ukraine, Russia, and literature data, we analyzed 437 records of Holocene turtles and 2847 current records of pond turtles. We identified areas that could serve as refugia for *E. orbicularis*, as a result of GIS modeling, while using 19 bioclimatic variables from the Worldclim and PaleoClim data bases. The data obtained confirm current hypotheses regarding the origin of more than 10 mtDNA lineages of *E. orbicularis* and the existence of multiple glacial refugia, and considerable Holocene home range dynamics.

We thank for cooperation the project "Pond aquaculture production and ecosystem service innovative research with modelling of the climate impact to tackle horizontal challenges and improve aquaculture sustainability governance in Latvia" (Nr. lzp-2020/2-0070), financed by Fundamental and Applied Research Projects (FLPP).

References

Nekrasova O., Yanish Y., Tytar V., Pupins M. (2019): GIS-modeling of the range shifts of the sub-fossil and extant European pond turtle (*Emys orbicularis*) in Eastern Europe in the Holocene. – Diversity, 11 (8): 121 (11 pp). ISSN 1424-2818. doi: 10.3390/d11080121.

IMPACT OF WATER POLLUTION ON THE FORMATION OF OXIDATIVE STRESS IN HYDROBIONTS

Water pollution is the cause of problems with the development of organisms living in water, hydrobionts. The possible causative agents get into the aquatic ecosystem with incompletely treated waste water or washing out from the soil under the influence of precipitation. The most significant groups of contaminants are biogenic compounds, heavy metals and organic substances with high biological activity, such as hormones, various drugs and their metabolites. In turn, these substances fit into the trophic net, thereby causing damage to hydrobionts as well as living organisms that consume them. Increased amount of antioxidants or their high activity in living organisms indicates oxidative stress

The activity of antioxidant catalase (CAT) and the amount of malondialdehyde (MDA) in *Perca fluviatilis* (L.), found in the river Daugava were studied. Perch was chosen as the object of the study because it occupies a higher place in the trophic net compared to other fish found in the river Daugava. The obtained data were compared with the results obtained by studying the same indicators for specimens encountered in the Lielupe. 1.5 to 2-year-old specimens were selected for the study.

The results show the increased MDA levels and CAT activity in perch found at separate sampling points, indicating point-to-point pollution of the river. This is also confirmed by the analysis of biogenic compounds (nitrates and total phosphates) in the water from perch sampling points. The highest antioxidant rates were in the vicinity of large cities – Daugavpils, Riga. This suggests of oxidative stress in the studied organisms, consequences of which can cause serious problems for the existence of certain populations.

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META-ANALYSIS AND BIOINFORMATICS EXPLORATION OF VITAMIN D RECEPTOR GENE POLYMORPHISMS AS POSSIBLE MOLECULAR MARKERS FOR MULTIPLE SCLEROSIS IN CASE/CONTROL STUDY IN LATVIAN POPULATION

Background. Vitamin D is a nutrient and hormone that has a critical role of calcium and phosphate metabolism. It plays an important role in pathogenesis of different allergic diseases, such as asthma and food allergy. Vitamin D acts through binding to special vitamin D receptors (VDRs), which are expressed in a variety of tissues. Genetic variants of VDR have also been studied as a potential factor of autoimmune diseases and allergic diseases since they may affect VDR activity. Among the known VDR polymorphisms, the most common that influence VDR expression within the immune system are Bmsl (rs1544410), ApaI (rs7975232), TaqI (rs731236) and FokI (rs10735810) (Kamel et al. 2014).

Aim. To determine the prevalence of VDR genetic polymorphisms in Latvian population and to evaluate its possible functionality of in order to analyse their applicability as molecular markers.

Methods. Literature and sequence data on VDRs genetic polymorphisms (Bmsl (rs1544410), ApaI (rs7975232) and TaqI (rs731236) were analysed using meta-analysis and bioinformatical tools for DNA and RNA secondary structure, DNA bending and transcription factor binding sites. Genotyping of 253 samples of Latvian population was made using allele specific PCR and restriction enzyme site polymorphism method.

Results. The majority of studied SNPs demonstrated allele-dependent alternative secondary structures. Differential structures of DNA and/or RNA were found. Marked differences in simulated DNA curvature and bendability depending on allele were observed. In European population, the prevalence of all SNPs is at least 34%, and there is information on their associations or linkage with different diseases in different populations. Minor allele frequencies in Latvian population are close to data of European population in average.

Conclusion. Meta and bioinformatic analysis of selected VDRs genetic polymorphisms (Bmsl (rs1544410), ApaI (rs7975232), TaqI (rs731236), and FokI (rs10735810) illustrate the potential of using them as possible molecular markers by genotyping in association study. Interactions of these polymorphisms with the gut microbiome and vitamin D levels in various disease cohorts in Latvians are planned in future studies.

Acknowledgements. The study was funded by the LU projekts 1.1.1.2/VIAA/4/20/718 “The role of vitamin D and its receptor gene polymorphisms in the modulation of intestinal inflammation in patients with recurrent and progressive multiple sclerosis”.

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NEUROTRANSMITTER SEROTONIN ACTS AS A SUPPRESSOR OF PHOTOTACTIC CHOICE VARIABILITY IN DROSOPHILA MELANOGASTER

Living organisms inhabit areas with changing conditions. However, the inconsistency of conditions can vary depending on the climatic zones of the Earth: environmental conditions in the tropics are more predictable than in the boreal zone. Consequently, the role of environmental factors in natural selection processes can vary from population to population. Thus, phenotypic differences between individuals, including the personal components of behaviour, can have a significant impact on the response to environmental uncertainty, which affects adaptation (sensory fitness).

Fruit flies (*Drosophila melanogaster*) are characterized by variability in behaviour and are among the best model species not only in genetics, but also in the study of the molecular mechanisms of animal personality. Our study demonstrates that in the northern populations of fruit flies, individuals are less predictable in their choice of phototactics than flies living in stable conditions. We have experimentally shown that the neurotransmitter serotonin acts as a suppressor of the variability of phototactic choice in *D. melanogaster* flies. Thus, a reduced amount of serotonin in the brains of flies living in the northern climates may be a mechanism of an adaptive bet-hedging strategy.

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ONE NEW SPECIES OF THE GENUS CELEBIA THOMSON, 1857 (COLEOPTERA: CURCULIONIDAE: EUPHOLINI) FROM LEYTE ISLAND, PHILIPPINES

Beetle taxonomy research in the Oriental region has become a hot topic of research over the last decade, mainly because of the rapid extinction of tropical beetle species due to rapid climate change, deforestation and biodiversity loss.

The genus *Celebia* Thomson J, 1857 is one of the genera that is still poorly studied and the potential number of new species in the genus is high. The genus *Celebia* currently contains 23 species, 9 of which are known from the Philippine Islands. The last taxonomic studies of the genus *Celebia* date back to the early 20th century. It should be noted that since then the number of sites from which new material is available has multiplied. The genus *Celebia* includes non-flying species of reduced dispersal capacity and a high level of endemism, which further increases the possibility that new species may be found in science from new territories.

Three new species of: *C. barsevskisi* Leitāne & Rukmane, 2019, *C. mindanaoensis* Leitāne & Rukmane, 2019, *C. negrosensis* Leitāne & Rukmane, 2019 have already been described. One new species of the genus *Celebia* Thomson, 1857 from Leyte island was newly described and further genus revision will be a major investment in exploring and enhancing biodiversity in the Oriental region.

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RARE EPIPHYTIC BRYOPHYTE AND LICHEN MODEL SPECIES ENVIRONMENTAL DEMANDS IN BOREO-NEMORAL FOREST LANDSCAPE OF LATVIA

Forest landscape contributes to significant amount of rare epiphytic bryophyte and lichen species presence in Latvia. Many epiphytic bryophytes and lichens are used widely as forest habitat indicators showing the degree of habitat naturalness. Due to the development of global industrialization, the amount of the suitable forest habitats for the presence of rare epiphytic bryophyte and lichen species are decreasing. Therefore the importance to understand environmental conditions affecting rare species population existence is crucial today. We compiled data about three rare epiphytic bryophyte and three rare epiphytic lichen model species in Latvia from the Ozols database with aim to understand the selected model species occurrence relationship with forest stand variables. We analyzed model species records in 190 forest stands in model species concentration areas in forest landscape of Latvia. Our study results revealed that forest stand age was significant variable for all studied model bryophyte and lichen species occurrence, but the importance of other variables differed among model species.

The study was financially supported by project: "Epiphyte metapopulation dynamics in boreo-nemoral forest landscape" (Nr. 1.1.1.2/VIAA/3/19/469).

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RESULTS OF ESTIMATION OF MINIMUM ADULT BOMBINA BOMBINA POPULATIONS DENSITY IN LATVIA USING ORIGINAL METRICS IN A LARGE-SCALE AUDIAL SURVEY

Audial surveys of *Bombina bombina* distribution are cost-effective and allow for the coverage of large areas, but they are usually regarded as unsuitable for *B.bombina* population size estimations due to imperfect detection. For this survey we used an original method (Čeirāns et al. 2020) for obtaining minimum adult population size estimates from vocalising *B.bombina* males counts by using sex ratios, life history and vocalising behaviour parameters from other studies. We collected data from 2016 to 2018 on 5 plots (each 25 km²) representing the *B.bombina* distribution area in Southern Latvia (Čeirāns et al. 2018). Territorial behaviour, associated with 'lek-mating', is found in *B.bombina*. The taxa had high CMPS estimates (having close to maximum scores during the most productive survey) and good waterbody detection probabilities.

B.bombina is only found in south and south-eastern Latvia and has a species range of ~470 km². In the study *B.bombina* was recorded in all surveyed plots within its range, and minimum its population size in Latvia could be estimated as only 3.7 ± 0.5 thousand adult *B.bombina*. All the main methods currently used in vocalising *B.bombina* monitoring are variations of the registration of calling intensity, not male counts, and they can be weakly related to true population sizes.

We thank for cooperation the project "Pond aquaculture production and ecosystem service innovative research with modelling of the climate impact to tackle horizontal challenges and improve aquaculture sustainability governance in Latvia" (Nr. lzp-2020/2-0070), financed by Fundamental and Applied Research Projects (FLPP).

References

Čeirāns A., Pupiņš M., Pupiņa A. (2018): Abinieku un rāpuļu fona monitorings un monitorings Natura 2000 teritorijās (2016.-2018. gadam). – Daugavpils Universitāte: 81 lpp.

Čeirāns A., Pupins M., Pupina A. (2020): A new method for estimation of the minimum adult frog density from a large-scale audial survey. – Scientific Reports: 10:8627.

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SHORT-TERM EFFECTS OF NITROGEN AND WOOD ASH ADDITION TO FOREST SOIL ON GROUND VEGETATION

Key words: forest fertilization, ground vegetation, ammonium nitrate, wood ash

The demand for woody biomass as a renewable energy source is increasing. Boreal and temperate forests are limited by nitrogen (N) availability and addition of N-containing fertilizers to forest soil significantly improve conditions for tree growth, thus increasing timber output. Ammonium nitrate is one of the most widely used N fertilizers in Europe. Wood ash is residue of biomass combustion, which contains major nutrients required for plant growth, except for nitrogen. Ash is alkaline, therefore it is also used as liming material. However, the side-effects of fertilization are possible changes species composition of in ground vegetation and loss of biodiversity.

In this study we investigated a short-term impact of ammonium nitrate and wood ash on species diversity and floristic composition of forest ground vegetation. The study was conducted in 28 forest stands representing different forest types. DCA ordination was performed and Shannon diversity index was calculated for control and treatment plots. Species composition, species richness and species diversity were analyzed. Results show species composition has not changed significantly and in both control and treatment plots it corresponds to the respective forest types. Addition of ammonium nitrate might have resulted in increased occurrence of several nitrophilous species. A repeated vegetation assessment will show, if changes persist longer.

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SOME ASPECTS OF SOIL FUNGAL COMMUNITIES IN NORWAY SPRUCE MONOCULTURES OF BALTICS

Afforestation of former agricultural lands and early forest thinning as forestry practices are applied in several countries. Those management strategies are beneficial to increase wood production potential and expand forest areas. However, the knowledge of the impact of those practices on abundance of forest diseases and resilience of soil microorganism communities are scatter. This study presents data of soil fungal community composition of young (21–40 years-old) Norway spruce (*Picea abies*) stands located in Baltics (territory of Latvia and Estonia). In total, study includes data from 61 location and 2440 soil cores. Soil samples for DNA sequencing and soil chemical analysis were collected according to Tedersoo et al. (2014 and 2020). Fungal internal transcribed spacer amplicons (*ITS1-5.8S-ITS2* rDNA region) of DNA extracted from forest floor and fine soil fractions were sequenced using PacBio sequencing platform. The soil fungi (including ectomycorrhizal fungi) abundance differed strongly among countries, which was related to regional soil differences (especially soil pH level). From higher taxonomic units, larger relative abundance of ascomycetes and lower of basidiomycetes was observed in samples from Latvia in comparison to samples from Estonia. From ectomycorrhizal fungi, dominant genus were *Amphinema*, *Russula*, *Tomentella* and *Inocybe*. Analyzing fungal ecological and functional groups, we detected that some ectomycorrhizal genus and extension types were more abundant in Estonia (p.e. *Piloderma*; ectomycorrhizal extension types: medium distance fringe and contact). Regarding saprotrophic fungi, there were some of the dominant genus more abundant in former agricultural lands (p.e. *Cadophora*). In conclusion, our research shows differences among communities of ectomycorrhizal fungi marked by countries (including soil differences). On more local scale, the forest management has an impact on several fungal groups.

Funding: European Regional Development Fund's Post-doctoral Research project No. 1.1.1.2/VIAA/2/18/298.

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THE NATTERJACK TOAD, EPIDALEA CALAMITA IN LATVIA: MAIN THREATS AND ONGOING SHRINKAGE AND FRAGMENTATION OF THE RANGE

The Natterjack Toad, *Epidalea calamita*, is a medium sized, largely nocturnal toad, which mostly inhabits open lowlands with loose soil, and spawns in shallow, open waterbodies, that may be temporary and (or) brackish. Its geographic range includes large areas of Western and Central Europe eastwards to the Baltic States and Belarus.

Historical data indicate the presence of two *E.calamita* population groups in Latvia in the past, one in western Latvia and another connecting populations from Estonia and Lithuania – in central Latvia (Čeirāns, Pupins 2019). Both groups have experienced local extinctions that started after the Second World War in the coastal habitats around developing cities, where there were possible bottlenecks limiting population connectivity.

Presently *E.calamita*'s range in Latvia has become split into four small- to medium-sized population groups with only two of them having connections with populations in neighbouring states, and this has produced major range gaps in Latvia dividing the once variably connected East Baltic *E.calamita* populations. The process of *E.calamita* range shrinkage continues, and we suggest that

the main risk for population sustainability in the region is a combination of adverse local factors or occasional climate events with poor population connectivity and dispersal barriers.

We thank for cooperation the project "Pond aquaculture production and ecosystem service innovative research with modelling of the climate impact to tackle horizontal challenges and improve aquaculture sustainability governance in Latvia" (Nr. Izp-2020/2-0070), financed by Fundamental and Applied Research Projects (FLPP).

References

Čeirāns A., Pupins M. (2019): Ongoing shrinkage and fragmentation in the geographic range of the Natterjack Toad, *Epidalea calamita*, in Latvia and the East Baltic Region. – *Zoology and Ecology*, 29 (1): 65–70.

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MULTIPLE ANTIMICROBIAL RESISTANCE (MAR) INDEX DESCRIPTION FOR STAPHYLOCOCCUS AUREUS AND ESCHERICHIA COLI

Objectives. Multiple antimicrobial resistance or MAR index is calculated as the ratio of number of antibiotics to which organism is resistant to total number of antibiotics to which the organism is exposed. Bacteria having MAR index > 0.2 originate from a high risk source of contamination. Aim of this research was to describe contamination risk patterns of two common bacteria species.

Methods. Research included 178 bacteria samples taken from random regional hospitals in Latvia, from those 93 samples were *Escherichia coli* (*E. coli*) and 85 were *Staphylococcus aureus* (*S. aureus*). Sample resistance was measured and analysed from 2015 to 2018. MAR index was determined to every sample and then analysed through the years. Antimicrobial susceptibility was performed according to CLSI 2010 (*Clinical and Laboratory Standards Institute*) guidelines, data collection was performed in Microsoft Excel 2012 and data statistical analysis in IBM SPSS (Kruskal-Wallis test, Fisher's exact test).

Results. Highest MAR index observed was 0.78 in *E. coli* group and 0.64 in *S. aureus* group. *S. aureus* samples from 2018 showed overall lower MAR index values than those from 2015 and 2016 ($p \leq 0.005$). When MAR indexes were assigned into groups: 1) ≤ 0.2 and 2) > 0.2 , there was no statistically significant difference through the years for both bacterial groups ($p > 0.05$). There were no samples in both groups that had a MAR index of 1. Mean MAR index in *E. coli* group was 0.28, *S. aureus* group 0.14.

Conclusions. Samples sent to BIOR laboratory from 2015 to 2018 did not demonstrate a statistically significant differences, when grouped into high risk and low risk groups in any particular year, but *E. coli* samples showed a stable pattern of being more of an environmental contamination risk. None of the samples obtained from 2015 to 2018 were resistant to all of the tested antimicrobials. In 2018 *S. aureus* samples showed lower overall MAR index numbers, than in the previous years.

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DETECTION OF EXTENDED SPECTRUM BETA LACTAMASES IN ENTEROBACTERIACEAE FAMILY

Background. *Enterobacteriaceae* causing a wide variety of infections in both-the community and the nosocomial infection. Its representatives – *E.coli* and *K.pneumoniae*, are among the most common cause of severe nosocomial infections all over the world. *E. coli* is the most frequent cause of bloodstream infections and urinary tract infections in the Europe. In addition, it is associated with intraabdominal infections and causes neonatal meningitis. *K. pneumoniae* is mainly found in the human gastrointestinal tract, the skin and the respiratory tract. Infections include urinary tract infections, lower respiratory tract infections, intra-abdominal infections and bloodstream infections. Similar to *E. coli*, *K. pneumoniae* can be resistant to multiple antimicrobial agents.

Aim. The aim of the current study was to isolate, identify and determine *K.pneumoniae* and *E.coli* resistance to antibacterial agents, to determine frequency of resistance and number of ESBL producing *K.pneumoniae* and *E.coli*.

Methods. The study was performed in Riga East University Hospital, "The Centre of Tuberculosis and Lung diseases", Laboratory of Mycobacteriology. The specimens of *K.pneumoniae* and *E.coli* were summarized and analysed in the period of 01.01.2018.–31.12.2018. There were used the following methods: Kirby-Bauer disc diffusion tests, E-test and for ESBL determination-double disc method. Overall, there were 234 *K.pneumoniae* and 136 *E.coli* isolates and antimicrobial resistance was detected to the following antimicrobial agents – amikacin, ceftazidime, ciprofloxacin, imipenem, meropenem, piperacillin / tazobactam.

Results. The most common *K.pneumoniae* resistance was determined to ceftazidime – 9.83%, the next most common to ciprofloxacin – 8.55%. Amikacin resistant was 0.85% of analyzed samples. There were no resistance to carbapenems – imipenem and meropenem, so there was 100% susceptibility determined. The total number of ESBL cases (n-23), compiling 9.83%. The most common *E.coli* resistance was determined to ciprofloxacin – 16.91%, next one to ceftazidime – 11.03%. Amikacin resistant was 1.47% of analyzed specimens. There were no resistance determined to piperacillin/tazobactam and carbapenems-meropenem and imipenem, compiling 100% susceptibility. The total number of ESBL cases 11.03% (n-15).

Conclusion. The antimicrobial resistance in *Enterobacteriaceae* remains problematic. Although the detected resistance was moderate, we still need continuous monitoring and greater effort to avoid this increase. An increasing threat is carbapenem resistance mediated by a range of carbapenemases, which may confer resistance to all beta-lactam antibacterial drugs. In other Europe countries, carbapenem resistance was almost always combined with resistance to several other antimicrobial groups, limiting the treatment options for infections caused by *E.Coli* and *K.pneumoniae*.

Acknowledgements. The authors declare the absence of conflict of interest.

KĪMIJA

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CHEMISTRY

Elina Sedlionoka, Jelena Kirilova

3-ISOTHIOCYANATOBENZANTHRONE AS NOVEL FLUORESCENT MARKER FOR AMINOACIDS

Nowadays are widely used luminescent markers for labelling different biomolecules, such as proteins. Proteins are amino acid polymers containing several side circuits. These side chains are used in active groups to add colorants and fluorochromes. Therefore, protein/antibody reactivity will be determined by the amino acid composition and the individual sequence in the three-dimensional structure of the amino acid molecule. Normally, polar groups (glutamine, serine, treonine) are presented on protein surfaces, which are available for modification. Protein modification reactions are nucleofield substitution reactions.

As an example, one of the most familiar protein colorants is the FITC, which is widely used to label antibody proteins. The FITC is labelled with isotiocyanate in the presence of a reactive group, must have a high temperature, pH, high protein concentration.

The study analyzes several methods for the visualization of proteins with 3-isothiocyanatobenzanthrone. The best conditions for the brighter visualization of molecules and new synthesis techniques for new fluorescent markers are identified.

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ANALYSIS OF THE COMPOSITION OF BIO-OIL OBTAINED IN THE PROCESS OF TIRE AND PLASTIC PYROLYSIS

Thermal disposal of plastic waste and tires is usually associated with the emission of several pollutants (e.g., Cl, N, S, Br, etc.). With regard to the potential for reducing pollutant emissions, the focus is on in situ methods. Usually "in situ" methods are realized by using catalysts, adsorbents or adsorbents with a catalytic effect in the pyrolysis process, which in turn increases the quality of the obtained bio-oil. Pyrolysis liquid or bio-oil is a product obtained from the pyrolysis process of biomass, and compared to other pyrolysis products, it is given more attention by scientific research. Bio-oil, obtained from various types of waste, consists mainly of water, organic acids, various hydrocarbon compounds and other components. It is known that the most complex and expensive part of the production process is the refining of bio-oil, so there is an increased demand from operators to determine the regularities between the chosen type of waste and pollutants from its pyrolysis process, as well as sensitive analytical methods for pyrolysis products.

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BIOGAS PRODUCTION POSSIBILITY FROM AQUACULTURE WASTE

The current global energy supply depends on fossil fuels (oil, coal, natural gas). Fossil fuels are a non-renewable resource and their reserves are declining very rapidly.

Unlike fossil fuels, biogas is a fully renewable resource because it is produced from biomass. Biogas will not only improve the country's energy balance, but will also make a major contribution to conserving natural resources and improving the environment.

Another major environmental challenge for modern society is the growing amount of waste. Controlled landfilling or incineration of organic waste is not a best practice, as environmental standards have now become much stricter.

According to the "Multiannual Strategic Guidelines for Aquaculture 2014–2020" it is known that the two biggest problems of fisheries (aquaculture) are the large amount of waste from fish life processes, as well as the large amount of energy required for economic activity.

The production of biogas by anaerobic fermentation is considered to be the optimal solution for the recycling of various types of organic waste, converting this waste into renewable energy and organic fertilizers.

The use of biogas in Latvia is at a crossroads. Experience in biogas production in landfills and wastewater treatment plants, as well as attempts to produce biogas on farms and farms. In turn, the production of biogas from aquaculture residues has not been studied and is currently not used in Latvia.

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COMPARISON OF DIFFERENT FLUORESCENT DYES FOR TREMATODA PROTOTOCUS CONFUSUS IMAGING

Genus *Prostotocus* (Digenea; Pleurogenidae) consists of a number of species, which are obligate parasites. *Prostotocus confusus* lives in definitive host's stomach or small intestine. The parasite commonly is found in green frogs (genus *Pelophylax*) and brown frogs (genus *Rana*). *P. confusus* is distributed in Palearctic. As there are no available information that parasite is causing any life-threatening disease for his host, it is not extensively studied. Nowadays, more and more qualitative data are demanded and use of modern microscopic methods such as confocal laser scanning microscopy (CLSM) can give high-resolution optical images. Benzanthrone dyes have a wide range of applications in chemical and biological research. Improvements in microscopy approaches gives essential advance in studies of digeneans. The aim of this study is to compare different fluorescent benzanthrone dyes for *P. confusus* imaging. Overall, eight different benzanthrone luminophores were used to label *P. confusus*. The present study resembled and corresponded morphologically to *P. confusus* described and visualized previously by other authors. Based on obtained results, it was concluded that benzanthrone dyes are appropriate for *P. confusus* staining. Results reaches the conclusion that AM1, P7 and AZM benzanthrone dyes are the most convenient dyes to imaging *P. confusus* organ systems by CLSM. Results confirmed: AZM is the most appropriate dye for excretory system labelling, AM1 – for digestive system labelling and AM1 – for muscle and reproductive system visualization.

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DEVELOPMENT OF A METHOD FOR THE ANALYSIS OF CO-PRODUCED GAS OBTAINED IN THE PYROLYSIS PROCESS FOR THE DETERMINATION OF POLLUTANTS

Pyrolysis-derived biofuels and co-gases are products obtained from the biomass pyrolysis process and, compared to other products, are receiving more attention from scientific research because they are used as feedstocks in the production of second-generation biofuels. It has been scientifically proven that the most difficult part of the production process is the cleaning of co-gases. Purification of pyrolysis co-gases from tars and other pollutants is a complicated and expensive process, therefore there is an increased demand from operators to determine the regularities between the chosen type of biomass and the pollutants arising from its pyrolysis process. The resulting co-gases require extremely low levels of contamination (less than ppm) to reduce the negative impact on expensive and sensitive catalysts used in the Fisher-Tropsch synthesis process, which tend to poison in the presence of contaminants and the subsequent destruction process. Currently, there are producers of bio-oils and co-gases in Latvia, from which there is also an extremely high demand for new and sensitive analytical methods for the determination of contaminants in their products. However, there is still a lack of practical research at national level to meet this demand.

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DEVELOPMENT OF A SPA ANALYSIS METHOD FOR THE MEASUREMENT OF NITROGEN ORGANIC COMPOUNDS IN PRODUCER GAS

Gasification is considered to be one of the most promising uses for biomass. The biosyngas is unique such that it can be catalytically converted into Fischer-Tropsch oils or other chemical products. However, in thermo-chemical biomass conversion processes, especially gasification, the tar content and its composition is a major subject. Nitrogen-containing tar compounds can strongly affect the performance of cobalt and iron catalysts and may cause irreversible deactivation of Fischer-Tropsch catalysts. Therefore, the analysis of nitrogen-containing tar compounds in biosyngas plays an important role. Adsorption efficiency of pyridine, pyrrole, aniline, benzonitrile, quinoline, and indole on the amino phase adsorbent and on the activated coconut charcoal were analysed. Aniline, benzonitrile, quinoline, and indole get practically completely adsorbed on amino phase adsorbent with any amount of tested compounds, with any volume of air drawn through and different air temperatures. Pyridine and pyrrole are also practically completely adsorbed on amino phase adsorbent with any temperature of the tube and with any volume of air drawn through, but only with the small mass of injected compound. The total sum of the pyridine and pyrrole adsorbed on both sorbents, when a comparably dominant mass of compounds is injected, allows for the assessment of the entire amount of these compounds in synthesis gas. The research has proven that use of a standard sampling device (500 mg of amino phase adsorbent +100 mg of activated coconut charcoal) allows for assessing nitrogen-containing tar compounds in synthesis gas.

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DEVELOPMENT OF AN ANALYTICAL METHOD FOR THE DETERMINATION OF POLLUTANTS IN INDUSTRIAL WATER USED FOR COOLING OF CO-PRODUCED GASES IN THE WASTE PYROLYSIS PROCESS

Recently, pyrolysis equipment is often used in various types of waste disposal processes, thus reducing the amount of waste disposed in landfills. As pyrolysis takes place at elevated temperatures, the co-gases formed in this process need to be cooled. The most convenient method of cooling is the use of process water. As the process water comes into contact with the co-gases during the cooling process, part of the co-pollutants passes into the water phase (soluble or mixed). It is necessary to utilize the technological water, therefore, before the utilization process, it is necessary to make sure that the water composition complies with the wastewater parameters, which are formulated in the Cabinet Regulation No. 34 "Regulations on the Emission of Pollutants into Water" (22.01.2002). Therefore, it is vital to control in the pyrolysis process, as well as to analyze the technological water composition for the determination of pollutants before utilization. Pollution control is also needed to monitor ongoing pyrolysis process parameters that can be changed to reduce pollutant emissions. Qualitative and quantitative analysis of pollutants also helps to choose more suitable technological water treatment methods before disposal.

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DEVELOPMENT OF STAINING PROTOCOL USING BENZANTHRONE LUMINOPHORES FOR TREMATODES MUSCLE RESEARCH

Trematodes are parasitic flatworms, also called as flukes, and they are found worldwide, Parasite belongs to Trematoda class in the phylum Platyhelminthes. Liver fluke *Parafasciolopsis fasciolaemorpha* is a parasite of moose (*Alces alces*), mostly found in Europe and Russia, and it is causative agent of parafasciolopsosis. Well developed musculature for parasitic flatworms has essential role in feeding, reproduction and movement. Flatworm musculature consists of three major muscle systems: somatic muscles (circular, longitudinal, diagonal muscle fibres), muscles of reproductive tract and muscles of adhesive organs. Confocal laser scanning microscopy is an essential technique in biology to discover parasite's gross anatomy of the muscle systems. The aim of this study is to develop staining protocol for somatic and adhesive organ muscles of *P. fasciolaemorpha*. Confocal laser scanning microscope was used to visualize whole-mount specimens using two lasers: green laser – absorption $\lambda = 488$ nm, with filter FITC; fluorescence $\lambda = 500$ –550 nm and red laser – absorption $\lambda = 638$ nm, with filter Cy5; fluorescence $\lambda = 650$ –700 nm. *P. fasciolaemorpha* was stained in parallel with various benzanthrone luminophores including benzanthrone dyes with amino acids. Comparing obtained results, it was confirmed that body wall's circular, longitudinal and diagonal arrays of muscle-fibre bands were observed. After several experiments it was concluded that the most suitable dyes for further staining protocol development are AZPP and AZP5. Our investigations into this area are still ongoing.

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SYNTHESIS OF NEW CONDENSED AZAHETEROCYCLIC COMPOUNDS

The work is based on the production of luminophores – new heterocyclic substances. Substances that were mainly used was Benzantrone, which is synthesized to obtain new substances, should be mentioned that luminescent substances are being studied a lot nowadays. However, diaminobenzanthrone is obtained by synthesis and has a dark reddish-brown color. during the synthesis process was performed Thin-layer chromatography (TLC) to show that a new substance had been released.

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KRĀSVIELU POTENCIĀLAS EKOTOKSISKAS IETEKMES IZVĒRTĒŠANA

Tagad liela uzmanība tiek veltīta apkārtējās vides piesārņojuma kontrolei. Vides ekoloģiskajā monitoringā ir prioritāri izstrādāt jaunas un jūtīgas metodes rūpniecībā un sadzīvē lietotu ķīmisku vielu ekotoksiskuma novērtēšanai. Mūsdienās krāsvielas bieži izmanto dažādās nozarēs un vēl biežāk – ķīmijā, bioloģijā, medicīnā un zinātniskos pētījumos. Krāsvielu izmantošana ir atkarīga no to ķīmiskām un fizikālām īpašībām, tāpēc ir ļoti svarīgi izvērtēt toksiskumu krāsvielām ar atšķirīgām īpašībām. Līdz šim tādu pētījumu skaits ir mazs un pārsvarā tas balstas uz mikroorganismu un dzīvnieku pētījumiem.

Dotais darbs ir vērsts uz jaunu ekotoksiskuma novērtēšanas metožu izstrādi, pielietojot augus (graudaugi u.c.) kā testa organismus. Tika pētīta krāsvielu iedarbība uz augiem to augšanas laikā. Augi tika kultivēti klimata kamerās, variējot krāsvielas un pievienoto krāsvielu šķīdumu koncentrācijas, tālāk veikta krāsvielu iedarbībai pakļauto augu morfofizioloģisku rādītāju (dīgstu garums, svars, šūnu membrānu stabilitāte u.c.) noteikšana un analīze.

Darbā iegūtie rezultāti par augu morfofizioloģisko parametru izmaiņām atkarībā no izmantotām krāsvielām un koncentrācijām sniedz svarīgu informāciju par krāsvielu bioloģiskām īpašībām, kā arī novērtē to pielietošanas iespējas vairākās nozarēs.

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LUMINISCĒJOŠU AMINOSKĀBJU ATVASINĀJUMU IZPĒTE

Fluorescējošās krāsvielas vien biežāk iegūst savu popularitāti dažādās nozarēs, tāpēc turpinās jaunu benzantrona savienojumu izstrādi un sintēzi. Aminoskābes, kuri bija izmantoti darbā, dabā piedalās olbaltumvielu biosintēzē, tāpēc luminofora krāsvielas uz aminoskābju pamata veido savienojumus ar izteiktu luminiscenci, kurus varēs pielietot kā organisku, luminiscējošu krāsvielu dzīvām šūnām.

Dotajā darbā galvenais uzdevums bija sintezēt jaunas luminiscējošās krāsvielas, lai iegūtu jaunus benzantrona savienojumus ar amīda grupējumiem un heterocikliskiem atlikumiem, kurus nākotnē varēs izmantot medicīnā vai dabaszinātnēs noteiktu biomolekulu krāsošanai. Tālākie pētījumi palīdzēs izstrādāt drošas diagnostikas metodes dažādām slimībām.

Darba mērķa sasniegšanai tika pielietotas organiskās sintēzes metodes – nukleofilās aizvietošanas reakcijas, alkilēšanas, halogēšanas, nitrēšanas un acilēšanas reakcijas, pateicoties tām, bija iegūti jauni benzantrona savienojumi ar amīda grupējumiem un heterocikliskiem atlikumiem.

Jaunieģūtājiem savienojumiem ķīmiskās un fizikālās īpašības tika pierādītas ar KMR un IS spektroskopijas un masspektrometrijas metodēm, kā arī bija izņemti absorbcijas un luminiscences spektri dažādos apstākļos (vairākos šķīdinātājos un dažādās pH vidēs).

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PREPARATION OF NOVEL EMISSIVE COPOLYMERS

Today luminescent polymers have gained wide interest for their applications because of useful chemical, mechanical, electronic, and optical properties. In this regard, at present, intensive research is being carried out on methods for obtaining new fluorescent polymers, mainly by copolymerization reaction under various conditions. The scientific literature describes many interesting classes of emitting polymers containing different atoms in the polymer backbone, but the search for more stable and brightly emitting polymers remains relevant.

The present work focuses on the synthesis of benzantrone substituted aminoderivatives with polymerizable chemical groups (allyl, vinyl, etc.) and their further copolymerization reaction in the presence of radical polymerization catalysts. Synthesized derivatives have from yellow to red fluorescence in organic solvents. The structure of obtained compounds was confirmed by NMR, MS and IR spectroscopy. In addition, chemical and optical properties of prepared polymeric compounds have been investigated in details. The obtained results show that synthesized copolymers may be considered as efficient fluorescent emitters for electroluminescent applications.

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SPIRTA RAŽOŠANAS TEHNOLOĢISKA PROCESA UN PIELIETOTU IEKĀRTU MODERNIZĒŠANAS IESPĒJU ANALĪZE

Graudaugu kultūras un to ķīmiskais sastāvs. Bioloģiski aktīvie savienojumi graudos. Raugu šunu uzbūve. Tehnoloģijas.

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SYNTHESIS OF BENZANTHRONE-3-CARBOXYLIC ACID AND ITS DERIVATIVES

Benzantrone derivatives bearing great luminescent properties have ubiquitous uses, a few of such being fluorophores in cell imaging, fluorescent polymers, probes for metal ions and compounds for production of thin films and liquid crystal systems.

Recently our group has synthesized 3-cyanobenzantrone, which has been proven to be good starting compound for obtaining other new fluorescent benzantrone derivatives, such as amide and heterocyclic compounds.

Thus, it has been decided to extend the research and we have explored the synthesis of benzantrone-3-carboxylic acid through acidic hydrolysis of the nitrile and subsequent basic hydrolysis of amide, reaction essentially being one pot synthesis. Further research has been focused on the synthesis of more reactive species – corresponding acid chloride, that has been obtained separately using oxalyl chloride and in situ using thionyl chloride for the synthesis of substituted amide, namely 3-(morpholine-4-carbonyl) benzantrone. Addition of methanol to the acid chloride immediately results

into the according ester. These reactions can now be further employed for the synthesis of other esters and N, N-substituted amides.

For the characterization of obtained compounds thin layer chromatography and mass-spectrometry has been utilized.

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SYNTHESIS OF NEW BENZANTHRONE DERIVATIVES WITH IMINE AND AMINE GROUPS

Benzanthrone and its derivatives are widely known dyes with bright fluorescence and high photostability. These dyes are luminophores, that emit from yellow-green to red-purple. In the literature are described a lot of monosubstituted benzanthrone derivatives with various functional groups. Despite the fact that some benzanthrone derivatives are widely used as fluorescent dyes and probes it is still needful to obtain new stable benzanthrone luminescent derivatives and to study their chemical properties. In this connection our work is dedicated to study new heterocyclic benzanthrone derivatives with imine functional groups, with potential luminescent properties. New substituted azomethines of benzanthrone were synthesized by condensation reaction of 3-aminobenzanthrone with appropriate heterocyclic aromatic aldehydes. The resulting imines were reduced with sodium borohydride to the corresponding amines, the luminescence of which is more pronounced in comparison with the initial azomethines. As a result 3 new benzanthrone aminoderivatives were synthesized: I9AH, IFH and IP2CH. The obtained compounds have been characterized by spectroscopic and chromatographic methods. The solvent effect on photophysical behaviors of synthesized imines and amines was investigated, and the results showed that Stokes shift increased, but emission efficiency decreased with the increase of the solvent polarity. The achieved results testify that emission of the aimed dyes is sensitive to the solvent polarity showing negative fluorosolvatochromism for azomethines and positive fluorosolvatochromism for prepared amines. The results obtained indicate that the synthesized compounds are promising as luminescent dyes. Synthesized benzanthrone derivatives in future will be used for biological researches.

DOKTORANTU SEKCIJA „LITERATŪRZINĀTNE”
≈
DOCTORAL STUDENT SECTION “LITERARY STUDIES”

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**THE IMAGE OF “LITTLE PEOPLE” IN CHILDREN’S LITERATURE:
ON THE EXAMPLE OF THE FAIRY TALES OF
L. AND I. TYUKHTYAEVS “ZOKI AND BADA”**

The “little people” in children’s literature is popular image. The presence of these creatures and other fantastic creatures is characteristic of a child’s worldview, since for a child they may well coexist in the real world and represent the “world of little inhabitants”. They characterized by a kind of diminutive model of the real world, in which we can find the modern life of people with their own economic and social problems. Fairy tales and stories about “little people” undoubtedly arouse the interest of the little reader. This type of characters bears a direct resemblance to the child and the world around him is great and incomprehensible for the child’s thinking. Despite this, the child does not lose his individualism and reproduces various ideas, which often turn into an exciting adventure. The child develops his worldview and an amazing ability to invent and fantasize. We can find all this in children’s art books, on the pages of which “little people” live. Fairy tales about small and fantastic people combine the features of everyday and fairy tales, to some extent also of myth. The author of fairy tales about Zoki and Bada, L. Tyukhtyaev, in the process of creating the story, also adhered to the idea that heroes like “little men” would be more attractive to the child, as this brings their image closer to the child and his understanding. In fairy tales, little characters are very reminiscent of blots, which painted in different colors. For a child, they presented as restless little creatures who do not want to obey the laws of adults and are constantly trying to resist this. These fictional characters are the creation of the authors. Like many other fairy tales, in the tales of Zoki and Bada, you can find some similarities with other stories and heroes.

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**THE PROBLEMATICS OF FEMALE SEXUALITY
IN ALICE MUNRO’S SHORT STORIES**

The present research discerns the concept of *female sexuality* suggested by Luce Irigaray as exemplified in Alice Munro’s short stories. A. Munro is widely recognized to have been among the first authors, especially in her breakthrough *Lives of Girls and Women* (1971), to portray the desire of young women for sexual autonomy. Nevertheless, the majority of female protagonists in her stories experience the denial, oppression and negation of female sexuality.

The reasearch aslo contains the debate of a French feminist’s Luce Irigaray’s ideas with Freud’s and Lacan’s understanding of female sexuality. In her “This sex which is not one” (1977) she defies Freud’s and Lacan’s analyses of sexual relations and proposes a female sexuality which is self-referential and disconnected from “masculine parameters” of sexual conceptualization.

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ВАРИАНТЫ СТЕРЕОТИПОВ О МИГРАНТАХ В СОВРЕМЕННОЙ ЛИТЕРАТУРЕ НА РУССКОМ ЯЗЫКЕ (ЧУДИНОВА, МУРАТАЛИЕВ, ПЕТРОВА)

Варианты стереотипов о мигрантах в современной литературе на русском языке на примере романа Елены Чудинова “Мечеть Парижской Богородицы”, романа Мусы Мураталиева “Идол и Мария” романа Александры Петрова “Аппендикс”)

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ВАРИАТИВНОСТЬ И ЖАНРОВОЕ СВОЕОБРАЗИЕ РОМАНА Е. ВОДАЛАЗКИНА «БРИСБЕН»

The article examines the concept of “variability” and analyzes the usage of this concept as a literary method in E. Vodolazkin’s novel “Brisbane”.

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ВОДНЫЕ ИСТОЧНИКИ В ЛИТЕРАТУРЕ ИНФЛЯНТСКИХ ПОЛЯКОВ

Весьма узкие временные рамки польско-инфлянтской литературы определяют и ее достаточно однородный характер в том, что касается тематики, пространственно – временных, аксиологических и жанровых моделей. В центре большинства текстов оказывается патриархальный мир, который чаще всего обращен в прошлое, в постсарматский 18 век, который в свою очередь предстает как некая идеальная модель.

Ориентированность на патриархальную модель предполагает четкое разделение практически всех элементов инфлянтского мира по оси свое-чужое. Свой мир образован во-первых определенными пространственными границами. В системе инфлянтского мира данные границы определены чаще всего природными объектами, в том числе водными источниками.

Водные источники (реки, озера, ручьи) занимают особое место в художественной системе инфлянтских поляков.

Во-первых, это одна из природных доминант инфлянтского мира, важнейшая часть инфлянтского пейзажа.

Во-вторых, это знак некоего промежуточного пространства, и как следствие промежуточного состояния, в том числе психологического.

В третьих, водные источники могут наделяться функцией хранителей памяти. Наконец, в четвертых, в отдельных текстах это пространство – носитель некоей высшей правды, пространство реализации судьбы.

EKONOMIKA UN SOCIOLOĢIJA

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ECONOMICS AND SOCIOLOGY

Jānis Pitrāns

DATU RELATIVITĀTI IMIGRĀCIJAS JAUTĀJUMOS

Migrācijas jautājumu aktualitāte ar katru gadu pasaulē tikai pieaug. Imigrācija un imigranti nevienuzīmīgi tiek uztverti mūsu sabiedrībā. Sabiedriskā doma tos vērtē pamatojoties uz indivīda pieredzi, vai publiski pieejamiem datiem, tomēr tie sniedz tikai daļēju priekšstatu par šiem procesiem. Imigranta tēls ir „izplūdis”, bet tā apraksts – relatīvs. Autors darbs ir par datu relativitāti imigrācijas jautājumos.

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DIVERSITY OF ETYMOLOGY OF THE CONCEPT OF THE BOARD OF A COMPANY IN THE FOREIGN DOCTRINE

Key words: board, etymology of the board concept, board functions

The Board is an executive body of a company. Its main function is the organisation of operational activities of the company in order to get profit. The lack of a common understanding of the concept of the board of a company causes controversy in the scientific community. The precise definition of the concept of the board of a capital company is an important condition for finding out its essence.

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FIN TECH COMPANY WITHIN SMART CITY: COST-BENEFIT APPROACH

Key words: smart city, fin tech company, cost-benefit approach, cost function

According to the European Commission, a smart city is a place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants and business. The smart city puts forward the severe requirements towards city infrastructure. The great share of contemporary services within smart city are represented by fin tech companies. They are flexible, mobile, customers trust them. These companies present many functions within smart city. The main advantages which the customers receive is the quick convenient safe on-the-spot services for comparatively low price; businesses, beyond quick safe transactions receive the business tools and extended access to analytics; financial institutions may refuse from costly designing of software and servicing it; government enjoys the decreased level of money laundering, fraud, cyber-attacks; environment becomes cleaner due to decreased emissions resulted from the decreased number of trips, etc. Nevertheless, the most important factor for these companies is their economic efficiency.

The goal of the research is to present the cost function of the projects, developed by fin tech company within smart city, and also income function.

However, it is not possible to limit the research by investigation of costs and revenues of the company, since there are many benefits, created by fin tech projects in smart city, which cannot be presented via quantitative tools. Therefore, the qualitative analysis is also performed.

Acknowledgements

This work was financially supported by project id. N. 1.1.1.2/16/I/001) of the Republic of Latvia, funded by the European Regional Development Fund. Research project No. 1.1.1.2/VIAA/3/19/458 "Development of Model of Smart Economy in Smart City".

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FINANCIAL STABILITY AND PROBABILITY OF BANKRUPTCY OF AN ORGANIZATION BY THE EXAMPLE OF "LBM" LTD

The aim of the work is the analysis of financial stability and forecasting the probability of bankruptcy of an organization by the example of "LBM" Ltd, as well as the development of ways to improve the financial stability of the organization. The timely assessment of the risk of bankruptcy of an enterprise has a high practical significance for both the managers of the enterprise and the managers of the counterpart enterprises. The topicality of the problem is explained by the development of the Latvian economy, the emergence of competitors in the construction sector, which forces the company to keep up with its financial situation, the ability to make timely informed decisions regarding the strengthening of the company's activity, increasing competitiveness and maintaining stability.

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GALVENĀS KREDITĒŠANAS POLITIKAS RAKSTURIEZĪMES COVID-19 LAIKĀ LATVIJĀ

Atslēgvārdi: *kreditēšanas politika, kredītportfeļa kvalitatīvie rādītāji, krīze*

Šobrīd gan Latvija, gan pasaule kopumā atrodas Covid-19 laikā, kad valstu ekonomiskās cieš. Analizējot komercbanku sektora kredītportfeļa kvalitatīvos rādītājus, izsniegto kredītu apjomu ar samērā neseno 2009. gadu, kad Latviju skāra globālā finanšu krīze, komercbanku izsniegto kredītu portfeļa apjoms ir samazinājies bez maz vai uz pusi. 2009. gadā tika izsniegti, apmēram, 23,8 miljardi euro, izsniegto kredītu apjomam samazinoties 2020. gadā līdz, apmēram, 12,9 miljardiem euro, Samazinājumu piedzīvoja arī nebanku kredītdevēju no jauna izsniegto kredītu skaits un apjoms. Vai straujais kreditēšanas samazinājums ir saistīts ar risku modeļa pārstrādi kredītpolitikā? Vai Covid-19 izraisītā krīze būs līdzīga iepriekšējai, kādas varētu būt atšķirības? Kā tas varētu ietekmēt kreditēšanas politiku?

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INFRASTRUCTURE FOR SMART ECONOMIC DEVELOPMENT IN LATVIA

Key words: *smart economy, ICT infrastructure, smart education, development*

The article showed the ICT sector development in Latvia, as well as ICT infrastructure development for smart economic development in Latvia. To create a smart economy, smart education, smart universities, smart transport systems, smart management systems, smart industries, etc. are needed. This is necessary for growth of highly qualified specialists and forming instruments for business

development in the country. The purpose of the article is to determine the main directions of ICT infrastructure for the smart economy in Latvia. To achieve this purpose, the following tasks are identified: 1. to consider promising directions for the development of the ICT sector, 2. to consider e-learning and smart education as drivers of the development of a smart economy, 3. to draw conclusions.

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INSTITUTIONS ENSURING SUSTAINABLE GROWTH OF MUNICIPALITIES

Key words: *institutional economics, new institutional economics, institutions, economic development*

The aim of the research is to audit formal and informal institutions in local governments that promote or hinder the sustainable development of local governments. In order to achieve the aim of the article, the article studies and analyses normative regulation, planning documents, scientific literature on institutional and new institutional economics school, as well as the fact that institutional and new institutional school formal and informal phenomena – combining norms and customs in the form of “institutions”. Formal institutions include normative regulation – the state constitution, legal acts and other norms that have developed mainly in political processes. Informal institutions, on the other hand, cover the prevailing beliefs, values and norms of behaviour in society, which have developed mainly in social and cultural processes.

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PATH DEPENDENCY AND INSTITUTIONAL INERTIA IN HEALTH POLITICS IN LATVIA

Path Dependency is a widespread phenomenon in politics, especially in fields related to non-profit and socially sensitive sectors as education and health politics. Institutions are formed by normative, formal as well as non-formal practices with the aim to protect and provide sustainability of the existing institution. So, they are acting in the approved, convenient, habitual, and time verified ways – and changes in those patterns are not welcomed. Institutions are trying to gain the equilibrium state in the society and stay in that position as long as possible without any intensions to change. Changes can be implemented only if there are severe risks to come to the situation, when existence of the institution is contested. That leads to the inertia of institutions, especially those acting in executive sector – like ministries, where civil servants are not elected, but appointed.

Due to the institutional inertia, most of the reforms in those sectors are not the new initiatives that could generate serious changes in roles, powers and every practice of the institutions, but mostly are the incremental changes that can be regarded as the corrections of mistakes of the previously implemented reforms.

The research on Health Politics of Latvia in the period 1991–2018 was based on analyze of health reforms in 1) the pre-election programs of the political parties, which had been elected in the Parliament; 2) the declarations of the Governments; 3) reports on health reform implementation from the Ministry of Health.

Research results showed that significant and transformative reforms where implemented only at the early stages of forming and organizing the new independent state. At the end on 1990s when the previously existed centralized planned and governed system system was destroyed and the new system: totally decentralized and based on free market rules was implemented. All the following changes were more dealing with the results, rather than new reforms.

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SOCIO-ECONOMIC CHANGES IN THE TERRITORIES OF THE LATGALE REGION (LATVIA) IN THE CONTEXT OF THE AVAILABILITY OF INFRASTRUCTURE

Key words: socio-economic scenario, simulation model, system dynamics modeling, Latgale Region, infrastructure development, community development

Continuing emigration and aging of the population, as well as its current age structure, create serious threats to social and economic development in the Latgale region. The consequence may be a shortage of human resources, a decrease in business activity, a low level of infrastructure development and high costs for its maintenance, limited financial and investment flows, etc., which can lead to the development of an economic and political crisis.

The aim of the study is to obtain new knowledge about socio-economic problems and their impact on the dynamics of the development and accessibility of the infrastructure of populated areas, namely housing, medical services, and educational institutions, by modeling the scenarios of its development.

A major shift in the age structure of the population will definitely affect the availability of medical services, the cost of housing, and the development of certain residential areas. The increasing demographic burden may amplify these factors significantly, even over the next 20 years. This can be partially prevented if negative trends are identified and adequate strategic decisions developed in advance.

The novelty of the research is in the use of the method of system-dynamic modeling, the application of the dynamics of relative indicators along with the dynamics of absolute indicators, as well as the relationship between factors and the time horizon.

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STARPTAUTISKĀS SADARBĪBAS LOMA BALTIJAS VALSTU KIBERDROŠĪBAS STRATĒGIJĀS

Atslēgvārdi: kiberdrošība, starptautiskā sadarbība, diplomātija

Ņemot vērā kiberuzbrukumu potenciālās postošās sekas gan valstu kritiskajai infrastruktūrai, gan ekonomikai, gan sabiedrībai, un to, ka kiberuzbrukumus aktīvi īsteno valstiski spēlētāji, arvien biežāk kiberuzbrukumi tiek definēti kā apdraudējums valstij. Tāpēc ar kiberdrošību saistīti jautājumi ieņem arvien būtiskāku lomu ne tikai valstu nacionālajās aizsardzības politikās, bet arī starptautiskajā drošības politikā.

Kiberdrošības jomā valstīm raksturīgi sadarboties daudzpusējās diplomātijas formātā, lai, piemēram, kopīgiem spēkiem vienotos par kibertelpas starptautisko pārvaldību, vai atturētu valstis no kiberuzbrukumu veikšanas. Tādām starptautiskajām organizācijām kā ANO, EDSO, ES un NATO starptautiskās kiberdrošības jautājumos ir atšķirīgas primārās funkcijas un uzdevumi. Raksta mērķis ir analizēt, kāda nozīme tiek piešķirta starptautiskajai sadarbībai Baltijas valstu kiberdrošības stratēģijās šo starptautisko organizāciju ietvaros un kādi ir Baltijas valstu izvirzītie mērķi un intereses globālajā kiberdrošības darba kārtībā. Rakstā tie arī pārbaudīts pieņēmums, ka, Igaunijas kiberdrošības stratēģijās starptautiskajai sadarbībai tiek atvēlēta būtiskāka nozīme salīdzinājumā ar Latviju un Lietuvu, kas skaidrojams ar valsti piedzīvotajiem kiberuzbrukumiem 2007. gadā.

Edmunds Jansons

STUDENT ENROLLMENT TRENDS IN REGIONAL UNIVERSITIES OF LATVIA

The aim of sustainable regional development is to promote and ensure balanced and sustainable development of every region of a state, while ensuring equal and optimal opportunities for every inhabitant to acquire quality education thus allowing a given region to benefit from inhabitants of high intellectual capacity and professional skills. The lack of highly educated people in regions can lead to lower probability of creation of new high wage jobs that require highly educated professionals. As a result regions with reduced availability to offer tertiary education lose young people to other regions where such possibilities exist and thus empowers the downward spiral cycle that stems the brain drain process. Disbalance in enrollment and attainment of students to regional universities have the potential to negatively affect the future development of regions outside of capital Riga. Equal access to the higher education in regions is an important precondition for a balanced development of society throughout the country and the national economy as such. The tertiary education is an essential element for the sustainability and competitiveness of any region.

This study indicates that the regional higher education institutions mirror the migration tendencies of workforce where apart from intraregional internal migration, the largest portion of general population of Latvia is located in Riga, and a further stream of people from regions tend to migrate towards the centre, as is true with the proportion of students from regions that tend to enroll in the HEIs within the capital city. The given situation allows to envision the future scenarios for sustainability of regional universities and to define the 'student enrollment migration' trends within the higher education system of Latvia.

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THE IMPACT OF THE DEVELOPMENT OF THE CONSTRUCTION INDUSTRY ON THE REMIGRATION OF THE POPULATION OF LATVIA

Throughout almost the entire history of Latvia's independence, a negative trend has been observed in relation to migration flows: a negative balance, reflecting the excess of those leaving over the number of arriving. The Baltic region is one of the most rapidly depopulating the world and, according to United Nations estimates, by 2050 the population of Latvia could be reduced by 22 percent.

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EIROPAS SAVIENĪBAS INVESTĪCIJU NOVĒRTĒJUMS UZ EKONOMISKAJIEM UN SOCIĀLAJIEM INDIKATORIEM 2004.-2020. G.

In pursuing its economic dominance in the world market, the European Union sets the European Union's priorities and objectives by the approved multiannual budgets. Achieving the objectives set out in the multiannual budget it is closely linked to the implementation of Member States' national policies and strategies, as well as to the programming documents for the administration of European investment funds. To find out the connection between the progress of the European Union member states as a result of the implementation of economic and social cohesion policy, the author has analyzed the indicators set in the European Union 2020 strategy, supplementing them with the related economic and social indicators.

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GADOS VECĀKU CILVĒKU EKONOMISKĀ NEVIENLĪDZĪBA – NABADZĪBAS VAI SOCIĀLĀS ATSTUMTĪBAS RISKS

Viens no ES reformu programmas izaugsmei un nodarbinātībai “Eiropa 2020” (European Commission, 2010) kopējiem mērķiem ir samazināt nabadzības riskam pakļauto iedzīvotāju skaitu (no 116.1 miljona 2008. gadā līdz 96.1 miljona 2020. gadā), (Eurostat, 2018). Lai novērtētu progresu šajā jomā, tiek noteikts nabadzības vai sociālās atstumtības risks, kuru piedzīvo ES valstu iedzīvotāji. Dati nabadzības vai sociālās atstumtības riska noteikšanai tiek noteikti apsekojuma veidā katru gadu pēc vienotas metodoloģijas visās ES dalībvalstīs - tiek iegūta informācija par iedzīvotāju ienākumiem un dzīves apstākļiem (mājokli, nodarbinātību, veselību u.c.), t.sk. rādītāji, kas raksturo nabadzības risku un sociālo atstumtību.

Latvija 2018. gadā ierindojās 2. vietā pēc nabadzības riskam pakļauto iedzīvotāju īpatsvara (434 tūkstoši iedzīvotāji, 22.9%), apsteidzot pozitīvā ziņā tikai Rumāniju ar nabadzības riska indeksu 23.5%, un bija tālu vidējā rādītāja ES (17.1%) un no labākā rādītāja ES valstīs (Čehija - 9.5%).

Latvijā dziļā materiālā nenodrošinātība kopš 2016. gada vairs nav visvairāk raksturīga personām 65 gadu un vairāk vecuma grupā, pie tam tai ir tendence samazināties - 2019. gadā šai grupai piederēja 10.0% no iedzīvotājiem, kas bija par 1.7 procentpunktiem mazāk nekā 2018. gadā, un par 16.6 procentpunktiem mazāk nekā 2013. gadā.

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UNIVERSĀLĀ PAMATIENAKUMA KONCEPTA ATTĪSTĪBAS IESPĒJAS LATVIJĀ: IEDZĪVOTĀJU APTAUJAS APKOPOJUMS

Key words: *Universal basic income (UBI), welfare, society*

Universal basic income is theoretically mentioned as a possible solution to the problems of the current and future socio-economic situation - growing inequality, globalization, automatization of work, and other factors that significantly affect the well-being of society. At the theoretical level, several advantages and disadvantages of the UPI concept are considered, so the author surveyed to find out the opinion of the Latvian population about the UPI concept as a whole and how it differs in population groups by gender, average income, and place of residence.

IZGLĪTĪBAS ZINĀTNES

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EDUCATIONAL SCIENCES

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CHALLENGES OF A SUSTAINABLE CARRIER GUIDANCE DURING THE PANDEMIC

Key words: career guidance, sustainability competences, pandemic, online career guidance system, resilience

The COVID-19 pandemic has influenced regular patterns of career guidance. Globally everything was stopped, projects were postponed and workplaces were closed but this situation made the career counselors to search for the new opportunities on how career guidance could be implemented. The pandemic has caused unknowing and insecurity in a job sector and caused a wave of layoffs, decrease of income and disruption of activities in many sectors. However, the career guidance during the pandemic can serve as a tool to understand the situation in a more depth and to search for a new opportunity that exist and help individuals to overcome anxiety. While practicing physical distancing, career counselors have kept active professional networks in assisting the clients in their needs. The operation of career guidance has transferred mainly to online format and required the counselors to develop new skills and competencies. The methodology of the study is interviews with the career counselors about the main challenges and solutions during the lockdown as well about the main competencies required for the career counselors. They were inquired also about how they shaped a more flexible online career guidance system. In interviews they revealed innovative practice how the respondents responded to the crises. The authors point to critical areas for improvement of quality service that career counselor provides to his/her clients during the lockdown.

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CHOICE OF ADVANCED COURSE PACKAGES FOR GENERAL UPPER SECONDARY EDUCATION PROGRAMS IN LATGALE REGION: PROFESSIONAL CHALLENGES FOR CAREER COUNSELORS

Key words: career education, career counselor, advanced course packages, general upper secondary education, thematic analysis

One of Latvia's most challenging tasks at the beginning of the 21st century is to implement educational change and reform at all levels of education. The general upper secondary education standard and the model curricula specify that an educational institution should offer several advanced packages of in-depth courses to help achieve the educational goal of a proficient student who is aware of his/her abilities and interests for a meaningful personal and professional future. The new approach and the changes in the regulatory documents are a big challenge for the career counselors who help to select the course packages. The study aims to explore the views of experts directly related to the work of teacher-career counselors on the selection of advanced course packs in Latgale secondary general education schools by conducting exploratory qualitative research. Semi-structured interviews were conducted with four experts representing urban and rural schools. The results of the interviews were analyzed using inductive thematic analysis. The outcomes of the study indicate that the selection of

course packages in Latgale schools is a major challenge both for career counselors and school staff. The experts admit that rural students feel insecure in their choice of course packages and are more at risk due to rural schools' limited offer of packages and lack of choice, lack of information or incomplete information on program content and further education opportunities. Urban students handle potential risks due to the choice of packages better and feel comparatively safer. Further empirical research on this topic envisages the collecting and analyzing data on a given topic from urban and rural students.

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CONFLUENT TEACHING APPROACH IN TEACHING THE SECOND FOREIGN LANGUAGE

The article scrutinizes the attempt to balance emotions and cognition necessary to accelerate the second language learning and acquisition. This approach of psychological trait combination is supposed to facilitate the teachers in teaching foreign languages by stimulating faster foreign language learning and acquisition of a learner. The confluent teaching is based on holistic, emotionally, and cognitively balanced foreign language teaching approach in the foreign language learning process. To prove this hypothesis, a research was carried out with the cadets, who studied the Russian, English, and French languages at the Military Academy of Lithuania and. The problem of the research was a too slow language learning with conventional language learning methods. For this reason, the aim of the research was to obtain faster language learning and acquisition by stimulating cognitive and affective capabilities of the learner based on confluent teaching approach. The object of the research is the learner's accelerated foreign languages learning and acquisition on ground Confluent teaching approach. The methodology of the article is based on Williams and Burden's (1997) formulated Confluent teaching approach who designed it on the Frederick "Fritz" Perls, L. Perls P. Goodman's Gestalt psychotherapy foundation. Holistic teaching methodology was essential for the research for it is based on the pivoting slant involving learning when the body, mind, emotion and spirit of a human being are balanced and work in unison together. Krashen's (1983) "affective filter" and Worde's (1998) language anxiety theories were analyzed and applied in the research. Lozanov's Suggestopedia method of teaching a foreign language on the foundation of positively stimulated emotions, feelings and cogitation, perception of an individual was implemented into acceleration of the language learning process.

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DYNAMICS OF CHANGES IN THE PROCESS OF E-LEARNING CHEMISTRY ON THE UZDEVUMI.LV TRAINING PLATFORM DURING THE PERIOD OF FORCED DISTANCE LEARNING IN LATVIA

Key words: *distance learning, Uzdevumi.lv, chemistry education*

Nowadays many educational institutions have switched to distance learning, in this regard, the demand for the use of electronic platforms for distance learning has increased. The purpose of the article is to present the results of a study dynamics by using the Uzdevumi.lv platform for organizing distance learning in chemistry during the spring and autumn semesters of 2020.

Materials and methods. The site with materials on the basis of Uzdevumi.lv platform is used.

Results and its discussion. Comparison of the use of e-learning sites for two semesters on the Uzdevumi.lv platform is based on the example of education in a basic school in Latvia. It is shown

that the number of users of the electronic platform Uzdevumi.lv has noticeably increased, and users also spend more time on the platform in one session. User performance has also improved. The largest increase is observed in the second semester of the 2019/2020 academic year since during this period there was a transition to distance learning. In the first semester 2020/2021 academic year there is also an increase, but not so impactful. This is due to the fact that the first semester began in full-time and only in the middle of the semester distance learning began.

Conclusion. Following the current situation, more and more users are mastering distance learning technologies.

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GLORIFICATION OF THE TOTALITARIAN ARMY: CHILDHOOD DISCOURSE OF NATIONAL SOCIALISTS OCCUPIED LATVIA

Key words: *National Socialist regime, childhood, propaganda, People's Aid Organization (Tautas Palīdzība)*

During the World War II, the National Socialists launched an extensive propaganda campaign convincing subordinated people of the occupied lands to accept the fact of occupation, ensuring the stability of the regime. In Latvia, one of the basic ideas of German propaganda was representing the Nazi forces as liberators, that will get rid of the previously ruling communist regime. This idea was widely cultivated in the public space: in the press, posters, advertisements and also in school textbooks. The propaganda materials emphasized the selflessness and heroism of the Nazi army, and the duty of civilians was not only to give this army a moral support, but also to provide the material aid for the fight on the front.

The support of army was entrusted to the People's Aid Organization (*Tautas Palīdzība*), founded on October 30, 1941. Organization was based on public charity institutions liquidated during the Soviet occupation era (*Latvijas Sarkanais Krusts, Latvijas Bērnu palīdzības biedrība, Latvijas Bērnu drauga biedrība, Veselības veicināšanas biedrība, Latvijas Sieviešu palīdzības korpuss, Rīgas latviešu labdarības biedrība*). An Assemblage of Schools for *Tautas Palīdzība* (*Tautas palīdzības Skolu kopa*), uniting children and young people, was added to these organizations with the aim of involving the younger generation in activities that would support the new occupation regime. The children became a target audience for Nazi propaganda. As wartime children, they had to learn to support and help the strangers' army of totalitarian power. From this fact, the research questions were set: How was image of the army used as a mean of propaganda to involve children and youth in support of the Nazi regime? How did the *Tautas Palīdzība* prioritize involving children and young people in activities for the front support? How did the children and youth assist the Nazi army in everyday practice?

The sources for this study are the written memories, recorded in 2019 by Jānis Milzarājs (born in 1934) about his experiences during the World War II. Sources also include Milzarājs' personal photographs. Propaganda posters available in the National Library's digital resource repository will also be used as the source material, as well as newspapers published during the Nazi occupation (1941–1944) and revealing the activities of the *Tautas Palīdzības* as well as a group of Assemblage of Schools for *Tautas Palīdzība: Izglītības Mēnešraksts, Tēvija, Tālavietis, Kurzemes Vārds* and *Daugavas Vēstnesis*.

Childhood experience in the conditions of the National Socialist regime during the World War II will be analyzed from the social perspective of childhood history which aims to examine childhood in the context of a particular era, society and ideology.

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NATURE AND THEORETICAL JUSTIFICATION OF ARTS THERAPY

Key words: *art therapy, types, method*

The roots of arts therapy, like many other therapeutic techniques, go deep in history. The language of artistic images is a special, universal language that contains common human concepts in symbolic forms. The origins of arts therapy relate to the cultural traditions of antiquity. In modern interpretation, art therapy is related to the field of psychiatry and is treatment, healing, development through any creative activity or “communication” with works of art. Art therapy is a method of influencing a child through drawing, modeling, singing, music, dancing, fairy tales.

The study analyzed different types of arts therapy, with a special focus on arts therapy at work with children.

The purpose of the study: to explore the nature and types of arts therapy.

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PATRIOTIC UPBRINGING IN VOCATIONAL EDUCATION IN THE CONTEXT OF NATIONAL DEFENCE TRAINING: THEORETICAL ASPECTS

Key words: *patriotism, patriotic upbringing, National Defence Education, professional education*

Cambridge University dictionary describes the term ‘patriotism’ as the love and pride of one’s native country. In the scientific literature, patriotism is most often described as special affection for one’s own country, a sense of personal identification with the country, special concern for the well-being of the country, and willingness to sacrifice to promote the country’s good. However, in the interdisciplinary context, there are also other approaches to understanding and interpreting the concept of patriotism. The research center SKDS’s study “The situation in the field of patriotism in Latvian society” (2018) concludes that patriotism in Latvian society is separated from political and economic processes, thus maintaining a high level of patriotism and a high negative attitude towards the processes in political and economic life. Separation from active political and economic activities is identified as a long-term problem. One of the solutions to this problem is the introduction of a new curriculum of National Defence Training (NDT) to educate patriotic citizens of Latvia. The main task of the program is to nurture an active, mobile, and capable member of society who wants and can defend oneself, fellow citizens, and Latvia in the event of a crisis. The NDT program sets for the development of patriotism, civic consciousness, fellowship, courage and physical abilities, promotion of the common good, and public welfare. For the first time in the Latvian education system, NDT is planned to be initiated in the school year 2024, however, it is important to introduce this mandatory subject not only in general education but also in vocational education institutions, taking into account the recent emphasis on vocational education development in Latvia. The policy initiative of the European Union Committee of the Regions “New Skills for New Jobs” (2009) states that an employer has to prepare employees for their field of work so that companies are competitive. When solving Latvia’s socio-demographic problems, including the migration of professional labor, special attention should be paid to a patriotic upbringing in vocational education institutions. One of the sources of it can be the new NDT program. Against this background, this theoretical review will examine the concept of patriotism and its understanding in the educational and interdisciplinary context; the outcomes of patriotism research in Latvia; potential and developmental opportunities of vocational secondary education to develop a theoretical background for envisaged exploration of NDT as an important resource for patriotic upbringing in vocational education institutions.

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POSITIVE AND NEGATIVE ASPECTS OF THE REMOTE LEARNING PROCESS IN FORM 9

Key words: remote learning, distance learning, form 9 pupils, positive and negative aspects

The global pandemic caused by covid-19 dramatically altered the daily rhythms for all the people of the world. The pandemic examined how quickly and successfully industries were able to adapt to the new conditions without losing quality of work. The education system also experienced significant changes. The usual presence had to be replaced by the remote learning process. Although this was meant to be a temporary solution, it has been a year before and pupils still need to continue learning remotely. Time to go ahead and school pupils are facing challenges in the closing state, but questions arise:

- Does the remote training process adequately prepare pupils for exams?;
- Have the tasks given by teachers provided knowledge and skills at a sufficiently high level?;
- The public has different views on the quality of the remote learning process and provided tasks, but what is the opinion of the parties involved in this process?

The work study will survey the 9th grade pupils, their educators, and the Education Board representative in order to obtain a comprehensive view on the preparation of Class 9 pupils for national tests while learning remotely.

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PROBLEMATICS OF THE SPECIFIC FIELD AND POSSIBLE SOLUTIONS WITHIN THE FRAMEWORK OF REALIZATION OF THE FOREIGN LANGUAGE STUDY COURSE AT THE FIRE SAFETY AND CIVIL PROTECTION COLLEGE

Key words: foreign language study course, problematics and solutions, specific field, foreign language for officials with special service ranks

International co-operation within professional field has become an integral part of everyday work, that is why knowledge of the mother tongue (state language) only, is not sufficient to be able to integrate innovations developed at the international level at the local level (within one country). Knowledge of a foreign language is recognized as a precondition for the integration of topical issues in the professional field and directly influences the level of development of a particular field within a country.

There is no need to look for additional arguments for the necessity to learn a foreign language, which has been confirmed by the European Commission in strategic documents. Acquisition of a professional foreign language is an integral part of any field of study and also applies to those study programs that are implemented by the Fire and Civil Protection College, which is subordinated to the State Fire and Rescue Service.

When learning a foreign language (with a professional orientation) it is compulsory to face the problems that are characteristic of each learning process, as well as difficulties (problems) that arise from the specifics and peculiarities of the specific field when training officials with special service ranks.

The following conditions should be mentioned as specific:

1. Officials with special ranks are in a subordinate relationship;
2. The students of the FSCP College study mainly technical subjects, while humanitarian subjects are given secondary importance;
3. Knowledge of English of the students is not tested, as a result the level of knowledge of a foreign language could differ significantly within one study group;

4. Lack of motivation to learn a foreign language, which, in fact, reflects the learners' misunderstanding of the need to acquire innovations within lifelong learning;
5. Insufficiency or absence of teaching aids containing field-specific terminology;
6. Unavailability of innovative technical means (special equipment) during the training process;
7. Strictly regulated algorithm of activities and procedures in the institution, including the implementation of the learning process.

In order to prevent or reduce the impact of the above-mentioned negative conditions on the study process (in general), as well as the implementation of a foreign language study course, a complex approach is required. In turn, before the implementation of certain organizational measures, it is necessary to carry out a detailed risk analysis process, which would avoid unjustified and irrational experimentation in the implementation of study courses and correspond to the findings that form the basis of the European education area and are important in terms of learning process in the context of FSCP activities.

Inese Butlere, Mārīte Kravale-Pauliņa

SKOLOTĀJA PROFESIONĀLĀ BRĪVĪBA UN ATBILDĪBA PROFESIONĀLĀS IEVIRZES IZGLĪTĪBAS IESTĀDĒS

Atslēgvārdi: skolotāja profesionālā darbība, atbildība, brīvība un profesionālas ievirzes izglītība

Latvijas attīstība nav iedomājama bez izglītotiem cilvēkiem un kultūras telpas attīstības. Kultūrizglītība nodrošina visdažādāko ar kultūras nozari saistīto profesiju pārstāvju – profesionālo mākslinieku, mūziķu, dejotāju, radošo industriju speciālistu sagatavošanu, taču ne mazāk būtiska loma šajā procesā ir skolotājiem. Skolotāji ir tie, kas rosina un veido nākotni, pilnveidojot profesionālās prasmes un attīstot kompetences gan sev, gan skolēniem, nākošiem valsts pilsoņiem.

Pētījuma autore pieredze, kas iegūta strādājot profesionālās ievirzes izglītības iestādē, aicina aizvien biežāk izvērtēt skolotāja profesionālo brīvību un atbildību, domājot par izglītības kvalitāti kopumā. Lai sasniegtu šo izvirzīto mērķi, pētījuma autori īstenoja kvalitatīvo un kvantitatīvo pētījuma dizaina stratēģiju. Pētījumā tiks skatīts skolotāja brīvības un atbildības filosofiskais pamatojums, skolotāja profesionālā darbība normatīvos dokumentos, lai izzinātu skolotāja autonomijas jeb neatkarības un patstāvības iespējamības šķautnes mācību procesa īstenošanā, iegūstot kvalitatīvu, mūsdienīgu un normatīvajos aktos definētu atbilstošu procesu. Pētījuma gaitā tiks izstrādāta aptauja un veiktas ekspertu intervijas. Iegūtie dati parāda, ka skolotāja profesionālā brīvība un atbildība ir subjektīvi rādītāji, kas pamatoti personas morālā apziņā. Skolotāja personība ir būtisks faktors izglītības kvalitātes nodrošināšanā, tādēļ liels izaicinājums ir ikvienam skolotājam izvērtēt savu profesionālo darbību ilgtspējīgas attīstības kontekstā.

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SPIRITUAL WELL-BEING OF BASIC SCHOOL PUPILS DURING THE PANDEMIC

Key words: spiritual well-being, pandemic, adolescents, domains of spirituality

Despite secularization tendencies in society, there is a growing interest in the study of well-being among different scholars who demonstrate the benefits of spiritual wellbeing on the wellbeing of an individual. There is no unified vision about the definition of spiritual well-being. There is an ongoing scientific debate on how to define spiritual well-being. The aim of the study is to explore the spiritual wellbeing of basic school pupils and to suggest strategies for the enhancement of pupils' spiritual wellbeing. The study reveals pupils understanding of their spiritual well-being and sources of spiritual nourishment. The authors present a detailed description of current studies on spiritual well-being and use Fisher's multidimensional scale of measuring spiritual well-being that includes

individual, communal, environmental, and transcendental aspects of spirituality. Fisher's scale was validated by the broad emotional research in many cultural contexts. The authors try to reveal how dominant are the four aspects of spirituality (personal, communal, environmental, and transcendental) in adolescents' life, which of them are evaluated higher than the other. Current studies ignore the multifaceted and multidimensional nature of spirituality; therefore, the authors focus on a holistic nature of spirituality of adolescents. The authors view spiritual well-being as a source of nourishment in crises that helps to develop coping with changes and difficult circumstances caused by the pandemic.

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SUSTAINABLE EDUCATION IN SCHOOL CURRICULA: EXPERIENCE OF THE ERASMUS+ PROJECT “ESD: SUPERVISION 4.0”

Key words: *education for sustainable development, ESD, curriculum, a whole institution approach, secondary school*

The report focuses on ways how to improve educational curricula in schools in order to align renewed curriculum with the needs of all stakeholders, including the issue of a sustainable management. It will reflect the main purpose of the Erasmus+ project “ESD: SuperVision 4.0” of integrating education for sustainable development (ESD) into school curricula that includes capacity building for teachers and educators, the development of a school as a whole institution approach and promoting a support for ESD in secondary schools to enable them to integrate ESD in school curriculum and to deliver ESD more effectively. The report will reflect on the best practice of teacher training in the international setting on empowering teachers to engage with a whole institution approach for the curriculum development and the role of universities in designing recommendations for policy makers on how to pursue curriculum development in the school curricula towards education for sustainability, addressing 17 Sustainable Development Goals (SDGs) as cross-cutting topics in the class.

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ANALYSIS OF BOTANICAL COMPOSITION IN HORSE-GRAZED PASTURES AT “TRĪS VĪTOLU STAĻĻI”, RIEBIŅI DISTRICT

The large domestic herbivores including horses have contributed to the development and further maintenance of the open and mosaic landscape of meadows and pastures in Latvia for a historically long period. Such semi-natural grassland ecosystems established in long-term interaction between nature and people represent one of the richest types of habitats in our country, containing about 1/3 part of plant species of Latvian flora. However, in Latvia still relatively little is known about the structure and floristic composition of those pastures, where seasonal horse grazing was the predominant type of land management of these grassland habitats. Therefore, since 2020 field studies of vascular plant species were carried out in horse-grazed pastures at “Trīs Vītolu Staļļi”, Riebiņi district to provide material for botanical interpretations and assessment of the diversity of plant communities. The pasture has an area of 26.7 ha and it is located at the north-west edge of the Feimaņu hummocky area, the Latgale Upland. In summer and early autumn of 2020 the floristic inventories were conducted following the procedures described by Gonzalez-Hernandez et al. (2020) in a set of six circular plots of 20 m diameter. Locations of inventoried plots were chosen to capture different areas of horse pasture, center coordinates of these plots were recorded by GPS. The presence of vascular plant species was recorded in all plots. In addition, vertical aerial photos of the whole pasture were obtained by drone DJI Mavic2 for detailed mapping of plant communities. During inventories in total 113 species of vascular plants were recorded in the pasture. The most common are such species as *Trifolium pratense*, *Scorzoneroïdes autumnalis*, *Phleum pratense*, *Plantago major*, *Lathyrus pratensis*, *Taraxacum officinale* and *Achillea millefolium*. Results of aerial mapping show that according to pasture location in relief, as well as soils and moisture regime, medium moist and moist grassland habitats can be distinguished within the territory.

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ANALYSIS OF REMOTELY SENSED DATA FOR ENVIRONMENTAL MANAGEMENT OF ESPLANĀDE WETLAND, DAUGAVPILS CITY

The importance of wetlands in terms of ecosystem services is manifold and includes such aspects as groundwater retention, wildlife habitat provision etc. However, their current situation in many EU countries is a matter of concern, both in terms of biodiversity conservation and socio-economic development. Particularly it can be addressed to wetlands in urban areas, where urbanisation causes stress on these ecosystems. One of such urban wetland is situated in Esplanāde estate, Daugavpils City. Therefore the appropriate management of this urban wetland has to be realised by the local authorities aligning it with the planning of city development. One of the tasks associated with the elaboration of wetland management plan is to ascertain the changes in wetland driven by climate factors or human impact. Simultaneously there is also a necessity to understand the trends in the wetland transition process, taking into account measures for their conservation. Hence a

comprehensive assessment of wetland ecosystem status and variations in hydrological regime is needed to guide restoration activities. Nevertheless, the conventional methods used in evaluating of wetland largely depend on field survey data which often do not provide spatio-temporal perspectives to the evaluation. Geospatial assessment of remotely sensed data has a wider and cost-effective potential for evaluation of wetland at different temporal and spatial scales. Thereby authors employed GIS analysis techniques and using of series of remotely sensed data to estimate changes in wetland over a 77-year period. Aerial images of 1944 georeferenced by authors and LGIA orthophotomosaics of 1995, 2005, 2010, 2014 and 2017, as well as aerial images taken in 2021 by small UAV, were obtained for this study. Results indicate the transition of wetland from floodplain habitat with hydrological regime controlled by floods of river Šūņupe to a swampy area with hydrological regime controlled by rainfall and groundwater inflow.

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ANALYSIS OF THE DISTRIBUTION OF HERACLEUM SOSNOWSKYI MANDEN IN THE TERRITORY OF BARKAVA PARISH

Heracleum sosnowskyi Manden is one of the most invasive species which threaten biodiversity also can affect animal and human health. Although the species was originally introduced as a valuable fodder crop, it has spread rapidly and uncontrollably. Nowadays *H. sosnowskyi* most often can be found in habitats disturbed by human: abandoned farming lands and gardens, pastures, roadsides, also in natural habitats such as forests in early succession stage and riversides. This study has been performed in territory of Barkava parish in Madona region. Stands of *H. sosnowskyi* have been surveyed and mapped using GPS. It was estimated that total area occupied by *H. sosnowskyi* in Barkava parish was 214,8347 ha, that corresponds to 1,14% of total size of parish. This invaded area of *H. sosnowskyi* has decreased since the previous survey. In addition to measuring the area, the stand was characterized by habitat, plant location and possible factor influencing the distribution, further creating a database, it was concluded that *H. sosnowskyi* are most often found on the sides of roads, fields and ditches, forming linear stands. Therefore, the main factors influencing the invasion are road repairs, agricultural and forestry activities. The prepared GIS data and digital maps can be used in a territory management planning.

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ANALYSIS OF THE FACTORS AFFECTING HYDROLOGICAL REGIME AND MORPHOMETRY IN LAKE KISEZERS

Key words: *hydrological regime, morphometry, influencing factors, natural, anthropogenic*

Lake Klisezers is situated in a densely populated area. The lake is surrounded by the city of Riga and private housing. The research on the analysis of the factors affecting Lake Kisezers includes the determination of both natural and anthropogenic impact factors. The determination of such factors is necessary to understand and predict how the lake changes in time and to seek for solutions how to manage the lake as a complex combined ecosystem. Natural impact factors combined with anthropogenic impact factors over time might lead to changes in the hydrology, hydrological regime, surrounding terrain, morphometry, changes in the catchment area, land use potential, and the lake's economical potential in general terms. This research aims to understand hydrological regime and bathymetry influencing factors and changes that may contribute to Lake Kisezers. Lake Kisezers was selected as the study site because of the availability of a wide range of data and cartographic

materials. The research results suggest that Lake Kisezers is hardly influenced body of water and it is necessary to perform regular monitoring for determination and regulation of the lake's exploitation. The main research result is a list of natural and anthropogenic factors having a direct impact. The main impact factor is the Riga HPP and densely populated lake catchment area. Further research is required to develop solutions for the management of every impact factor separately in favor of the sustainability of the lake. The repetition of this study requires hydrological, bathymetry, meteorology data, and cartographic materials for an extended period. The research was performed using open source cartographic materials, hydrological, meteorological data. The data processing was performed in open-source computer software such as QGIS. The research results can serve as an example for delineation and analysis of influencing factors for other lakes.

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ASSESSMENT OF CHEMICAL AND BIOLOGICAL WATER QUALITY OF THE LAUCESA RIVER

Object of research is Laucesa river and its catchment area, which is the border river between Latvia and Lithuania. Member States of the European Union Have the goal, what is based on Directive 2000/60/EC a framework for Community action in the field of water policy, there are no new and reliable data about Laucesa river. Research concept: to the water quality data of Daugava river basin transboundary water object be relevant and reliable, is necessary to assess the water quality of Laucesa river.

The methods for determining water quality were: field research were every month from July 2020 to March 2021, a total 9 times in 7 research sites, physico-chemical parameters were obtained during the expeditions with a multi-parameter probe YSI Professional Plus, water samples were collected for BSP⁵ analysis and spectrophotometric analysis, once were collected zooplankton samples.

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ECOSYSTEM SERVICES AND HUMAN WELL-BEING: A CASE STUDY IN DAUGAVPILS CITY AND MUNICIPALITY

Ecosystem services (ES) are a direct and indirect contribution of natural ecosystems to the well-being of people which directly or indirectly supports human survival and quality of life. The concept of the European Union 2020 Biodiversity Strategy highlights the importance of green infrastructure natural values for human well-being and is defined as one of the main policy priorities of the European Union. The new approach to the Green Infrastructure concept is the provision of ES, which includes the biodiversity objectives of the ecological networks, ensuring the ecosystems multi functionality and capacity to provide the most important ES for human well-being.

Mapping and assessment of ecosystem services totally depends on reliable data and good science. An in-depth assessment of ecosystem services, in particular social, health and safety benefits are essential to correctly identify the value of services provided by ecosystems and contribute to their future development. In the context of spatial development planning, it is important to involve local society in the planning and decision-making process, in the form of a survey or public consultation. The local nature values, conditions and situation are well known to the local residents, so the solution proposed by the public could be the most appropriate for the sustainable development of the territory.

The survey was conducted in 2020 and displays opinion of 231 Daugavpils city and municipality residents. The analysis of interview results reveals that ES play an important role in people's daily lives. The most mentioned cultural ES were recreation and eco-tourism, health, inspiration, sense of place, education and knowledge; regulating ES: air quality regulation, water regulation and

purification, disease and pest regulation, natural hazard regulation and pollination; provisioning ES were food agriculture, fresh water, berries and mushrooms, fiber, timber, wood and supporting ES: biodiversity and species.

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ESTIMATION AND MAPPING OF EXOGENIC GEOLOGICAL PROCESSES AND LANDFORM COMPLEXES AS AN INTEGRAL PART OF THE ASSESSMENT OF GEOMORPHODIVERSITY INDEX IN PROTECTED LANDSCAPE AREA "AUGŠDAUGAVA"

During the last two decades, scientists have been developed the concept of geomorphodiversity index (GMI), which allows to quantify the diversity of the abiotic components of landscape, as well as to substantiate the distinguishing the areas of geoconservation significance. Among other variables of abiotic components needed for the calculation of GMI, the spatial distribution of landform complexes and exogenic geological processes is very important. Hence authors performed a case study in protected landscape area "Augšdaugava" (PLA) and the objectives of this research were: (1) to delineate landforms of all morphogenetic groups which occur in the area of PLA; (2) to estimate the types of exogenic geological processes, to identify their intensity and geographic location; (3) to prepare data in GIS environment for further computing of GMI values. The obtained results show that in the study area such exogenic geological processes as river bed lateral erosion, fluvial accumulation processes associated with the formation of point and middle sand bars in the channels of the river and its tributaries, gully erosion, as well as processes of suffosion and mass movement can be observed. Landforms associated with fluvial processes in the PLA are represented by river valleys, terraces and gully incisions, but the group of mass movement processes are mostly represented by rotational slumps, block landslides and slides. The data which are one of the outputs of the presented study illustrates the spatial distribution of landforms and geomorphological processes in the PLA and can serve as a basis for various applications, such as elaboration of GMI map or use for purposes of nature conservation etc. Accordingly, such GMI map obtained during the estimation and quantification of the abiotic components is an essential prerequisite for a better understanding of differences in biodiversity and explanation of its spatial variability at the landscape scale in this protected nature area.

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IDENTIFICATION AND ANALYSIS OF FLUVIAL TERRACES IN THE NATURE PARK "DAUGAVAS LOKI"

Fluvial terraces are frequent landscape elements of many river valleys located in different regions. During the last decades, the number of studies on these landform features has increased noticeably, due to the availability of high-resolution digital elevation models (DEM) and application of semi-automated tools and machine learning algorithms for identification of terraces and their elements. Fluvial terraces have been studied from different points of view and with different objectives, including paleoenvironmental significance, geomorphological characteristics, development and glacial isostatic adjustment processes etc. Beyond the different topics of these studies, terraces as fluvial landforms are considerably complex, since they have been developed in the course of the interplay of many geological processes - incision, accumulation, lateral erosion and mass wasting. However, fluvial terraces as landforms of complex origin commonly are not well expressed and preserved in the Nature Park "Daugavas Loki". Until recently, distinguishing and mapping of these features have required extensive field surveys. Considering that, in this study was applied an

integrated methodology based on using of remote sensing (LiDAR) data and combining of different semi-automated GIS analysis tools for the detection of fluvial terraces in DEM. DEM with spatial resolution 0.4 m was created by ArcGIS using LiDAR data provided by the Latvian Geospatial Information Agency. After that, extraction and generalization of terrace surfaces were done following the standard procedures (Stout and Belmont, 2013), but multi-shadow, slope and profile curvature tools were applied for delineating elements like foothills and edges of terraces. GIS analysis indicates that obtained results provide much more information than those previously obtained from the analysis of topographic maps and manual digitizing of contour lines, particularly in terms of interpretation of local morphology of fluvial terraces.

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INTRODUCTION OF STANDARD ISO 14001: 2015 ENVIRONMENTAL MANAGEMENT SYSTEM STANDARD “DAUGAVPILS DZEZSBETONS”

ISO 14001: 2015 is one of the world's most recognised standards for environmental management systems. It is based on quality management principles. It shall be universally applicable to the specific requirements of each individual company or organisation. Products manufactured in the establishment comply with the binding production standards and the applicable laws and regulations. Technology and materials shall be used in the manufacture of reinforced concrete structures that ensure high geometrical accuracy of the elements. Work is carried out in accordance with European quality standards. In order to ensure control of production processes, product quality and compliance with environmental management requirements, the company has been certified in accordance with the standards ISO 9001: 2015 and ISO 14001: 2015. The production of the company is delivered to customers in Latvia, the Baltic and Scandinavian countries. Daugavpils Reinvestment Ltd, all processes that are carried out to ensure the contractual relationship to the customer are identified (viewed) as a supply chain in which each process of realising the project interacts with each other from the stage of preparation of the offer to the transfer of the subject of the contract to the customer and where process/supply chain management is planned and controlled, following the result and feedback. of all stakeholders. The supply chain is also binding on Daugavpils concrete for processes. In order to carry out the processes as efficiently, better, safer and more environmentally friendly as possible and to achieve the expected results, the entity shall assess the management of the processes in general and/or at different stages/chapters, assess internal and external conditions, and identify bottlenecks or risks that affect or may affect the expected outcome, where possible, by identifying operational risks for reduction or prevention.

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INVASIVE ALIEN PLANT SPECIES IN PROTECTED DENDROLOGICAL PLANTINGS IN EAST-LATVIA

Invasive species are non-representative plant species of Latvian nature which threaten local species and habitats, including protected values. The study was conducted in 14 specially protected dendrological plantings in East-Latvia. In dendrological plantings, 13 invasive alien plant species were identified. The largest number of invasive alien plant species were found in the dendrological plantation of Runtorta. More commonly identified invasive plant species in the areas studied – *Solidago canadensis*, *Impatiens glandulifera*, *Impatiens parviflora*, *Heracleum sosnovsky*.

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LIPIDS IN THE LIFE-CYCLE OF THE ALIEN AMPHIPOD GAMMARUS VARSOVIENSIS IN THE DAUGAVA RIVER

Ponto-Caspian amphipod *Gammarus varsoviensis* is a dominant amphipod in the Middle Daugava but ecological and physiological studies of the species are insufficient. In crustaceans, such energy reserve as lipids (triglycerides) is important for long-term energy storage especially concerning reproductive activity. Our study provides insight into the seasonal dynamics of lipids of alien amphipod *G. varsoviensis*. Qualitative samples of amphipod *G. varsoviensis* were collected in the three/ four sites in the Daugava River (included Pļaviņas Reservoir) once or twice times in the month from April to September in 2020 in the depth up to 0.5 m using a hand net with a mouth opening of 25 x 25 cm (500 µm). Mean lipids concentrations were higher in females (59.6 mkg/mg*FW) than in males (19.6 mkg/mg*FW) and showed seasonal trends. Lipids concentrations from April to September were higher in spring, early summer, decreased in summer and autumn again increased coinciding with the reproductive period. For example, in May females reached the highest lipids concentrations (mean 103.5 mkg/mg*FW) before new generation production.

This research was supported by the DU Research Project No. 14-95/14 "Ecophysiological state and its changes of the alien amphipods in the Daugava River".

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LONG-TERM PERSPECTIVES OF BOMBINA BOMBINA AND ITS INVASIVE THREAT PERCCOTTUS GLENII IN LATVIA: GIS-MODELLING OF THE SPECIES DISTRIBUTION UNDER GLOBAL CLIMATE CHANGE

Amphibians are greatly affected by invasive species through direct predation and competition. Being triggered by climate change, the invasion of *Perccottus glenii* (the Chinese sleeper) in Eurasia may have detrimental consequences for the fire-bellied toad (*Bombina bombina*). The invader can feed upon *B. bombina* toads and juveniles and compete for food.

The algorithm used in this study (Pupina et al. 2018), Maxent, has proven good performance and accuracy for SDM studies. Maxent is a machine learning algorithm. Its main advantage in comparison with other methods is that it only needs the species presence point data, besides the environmental layers. We used correlative species distribution models (SDMs) to infer competitive interaction between the invader and native species.

As a result, a significant level of correlation ($r=0.636$) between both SDMs was found. It means that there is a considerable overlap of areas of similar habitat suitability related to the species and a potential for competition. For strategical management of both species in Latvia for nature conservation purposes, we mapped areas in the country according to two main criteria: 1) the lesser chances of negative interactions between species, and 2) a possibility to avoid unwanted contact and competition between the fish and the toad.

References

Pupina A., Pupins M., Nekrasova O., Tytar V., Kozynenko I., Marushchak O. (2018): Species distribution modelling: *Bombina bombina* (Linnaeus, 1761) and its important invasive threat *Perccottus glenii* (Dybowski, 1877) in Latvia under global climate change. – Journal of Environmental Research, Engineering and Management, 74 (4): 79–86.

We thank for cooperation the project “Pond aquaculture production and ecosystem service innovative research with modelling of the climate impact to tackle horizontal challenges and improve aquaculture sustainability governance in Latvia” (Nr. Izp-2020/2-0070), Fundamental and Applied Research Projects.

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MAPPING OF HYDROGEOMORPHOLOGICAL UNITS IN THE DVIETE WATERSHED

Hydrogeomorphologic factors to the great extent control the formation of runoff and the source-to-sink flux processes of sediment and dissolved solids transferring within the river watersheds. Hence these controlling factors influence the quality of water and are important for the management of water resources. Besides studies focused on hydrogeomorphology of river watersheds are essential for the assessment and mitigation of flood hazards and optimal land use planning. Therefore the identification and mapping of hydrogeomorphological units (HGU) in river watersheds are one of the essential preconditions for planning and implementation of appropriate water resources management, agricultural development, as well as territorial planning at the local or regional scale. In addition, such studies contributing to the achievement of environmental targets formulated in several European Union policies, e.g. the Water Framework Directive, Floods Directive etc. Thereby mapping of HGU has been performed over one case-study territory – a relatively small watershed of the river Dviete. For this purpose digital elevation model (DEM) with high horizontal resolution (0.4 m) and high vertical accuracy was generated from the airborne laser altimetry cloud point data provided by the Latvian Geospatial Information Agency (LGIA). At the initial stage, using of flow direction and flow accumulation ArcGIS tools in combination with vectorised data on channels of streams and tributaries allowed to delineate sub-basins. On the next stage data on vegetation cover and landuse types inferred from RGB and near-IR orthophoto mosaics coupled with satellite images of inundated areas and hydrological data on flood levels were laid-over the sub-basins delineated in DEM, allowing the more fine distinction of HGU. Finally, these units were used as entities for classifying the Dviete watershed into areas of similar hydrogeomorphological characteristics.

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POST FIRE TREE DAMAGE DEGREE ASSESING AFTER FOREST FIRE IN NATURE RESERVE “STIKLU PURVI”

Key words: forest fires, nature rezerve, tree damage, natural regeneration.

Nature Reserve “Stiklu purvi” is the biggest raised bog array in western Latvia. The territory is included in NATURE 2000 (protected nature territory of European significance). Eight biotops listed in Annex 1 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and two Latvian significance specially protected biotopes are present in this territory. The area of nature reserve is 7245 hectares.

In 2018 the forest fire in nature reserve “Stiklu purvi” burned out 1353,15 hectares big area of forest lands and swamps causing serious damage to the environment. In the research was evaluated post fire tree damage and the course of natural forest regeneration after forest fire in 2018 in forest stands of nature reserve “Stiklu purvi”. The methodology was adapted on the basis of Latvian State Forest Research Institute “Silava” study. Data were obtained using visual observations and instrumental measurements. In field study obtained data: tree species, condition, diameter, hight of tree, crown

transparency, height of stem scorch, soil condition in 1 meter radius around the tree, infestation by vermin.

It was observed that downy birch, as pioneer species, were found in more than 90% of plots. Totally were inspected 118 trees and 40% of trees were dead.

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REMOTE SENSING (LIDAR) DATA PROCESSING FLOOD RISK ASSESSMENT DAUGAVPILS GRIVA AIRFIELD TERRITORY

Floods are irregular increases in water levels that flood large areas of the river. The flood risk was done for the Daugavpils Griva airfield territory. The Daugavpils Griva airfield territory are located in Daugavpils region, Kalkūnes parish. Daugavpils Griva airfield territory is a protection zone for surface water bodies and flood risk areas. The aim of the study is to create a digital elevation model using remote sensing data (LiDAR) and use hydrological data to identify the flooding areas Daugavpils Griva airfield territory. In order to create flood areas, hydrological observation data were obtained from the "Latvijas Vides, ģeoloģijas un meteoroloģijas centrs" from the observation station "Daugavpils" from 1924 to 2019. Then was constructed empirical collateral curve and use the formula was calculated the flooding limits at high-risk probability. Digital elevation model creation is used ArcGIS 10.7 and LiDAR *las* data that are available in "Latvijas Ģeotelpiskās informācijas aģentūra". In the beginning use *las* data was created *LAS Dataset*. Digital elevation raster with filtering *ground* was created used *Make Dataset Layer*. Digital elevation model was added the shadow, done with *Hillshade* function. From a digital elevation model was created horizontals with heights, made use of the *CountourList* tool. As a result, was created 2 years, 5 years, 10 years, 24 years and 49 years flood return period maps.

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RESULTS OF NUTRIENTS CONCENTRATION SHORT TERM MONITORING IN DAUGAVA TRIBUTARIES - A CASE STUDY IN THE DVIETE RIVER

Dviete is a tributary of the Daugava River with a relatively small watershed ca. 254 km². Such headwater watersheds drained by small rivers have been recognized throughout the world as important sources of matter supply to the main regional watercourses. In such context, streams and tributaries of larger rivers are functioning as direct links for transferring runoff water, and simultaneously delivering nutrients from adjacent areas into lakes and rivers. Thereby studies focused on the water quality in the headwater watersheds like the Dviete basin have great importance for the environmental management of water resources and preservation of nature values associated with river floodplains. Hence the goal of this research was to identify the concentration of the nutrients and to monitor their short-term seasonal changes. For this purpose, data on the nitrogen compounds (NH₄⁺, NO₃⁻, N_{tot}) and phosphorus compounds (PO₄³⁻, P_{tot}) concentrations were obtained in the course of monthly water sampling at 11 points along the Dviete flow from its source to the estuary and subsequent analysis of these samples by a flow injection analysis device FIALab 2500 according to the standard methods. The results of seasonal variations of the nitrogen and phosphorus compounds indicate, that the lowest concentrations are observed in summer, whilst the highest - in winter. This fact can be explained by biological metabolism and consumption of nutrients during vegetation season, as well as by decomposition of organic matter during the cold season. The data of short-term monitoring also reveal that due to natural and anthropogenic processes water quality in the river can

change significantly. Particularly excessive enrichment of Dviete water by nutrients from point sources of anthropogenic pollution creates favourable conditions for the rapid growth of algae, hence contributing to eutrophication of the Dviete aquatic ecosystem.

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SPATIAL DISTRIBUTION AND GRANULOMETRIC COMPOSITION OF QUATERNARY SEDIMENTS IN THE NUMERNES LATERAL SHEAR-MORaine RIDGE

Data on the spatial distribution of Quaternary sediments making up landforms, as well as the granulometric composition of associated glacial and glacioaquatic deposits are substantial for the understanding of glacial morphogenesis in Latvia towards the end of Pleistocene. This recognition can be extended to lateral shear-moraines (LSM) – specific landforms, which typically are represented by very elongated, linear or slightly meandering ridges. One of such LSMs – the Numernes ridge – is located in the eastern part of Latvia, northward from the Latgale Upland. Despite the fact that Numernes LSM was described in the literature as ‘ice cleavage ridge’ more than 40 years ago, its geology, including the granulometric composition of sediments, remains insufficiently studied in comparison to similar landforms in North America and Europe. Therefore, a geological field survey was carried out and the spatial distribution of Quaternary sediment cover was ascertained, performing large-scale geological mapping. Mainly conventional geologic survey, i.e., near-surface augering by AMS MudAuger system and georeferencing by GPS was used to investigate the lithofacies of glacial and glacioaquatic sediments, as well as their spatial distribution. In total data from 77 shallow boreholes was obtained and the corresponding number of samples of relief-forming sediments were collected from boreholes. Analysis of the grain size composition of these samples has been carried out with a particle size analyzer Malvern MASTERSIZER 2000. Besides, during expeditions survey of peat thickness in the glaciokarst kettles of Numernes LSM was carried by steel rods probe and Eijkelkamp peat sampler. The obtained results show that the spatially most common type of Quaternary sediments forming Numernes LSM is deposited in glacioaquatic environments. The contribution of the glacial deposits like glacial tills is less significant as constituents of the geological structure of the ridge. Sporadically, younger bog sediments of the Holocene time have been formed and continue to accumulate in glaciokarst kettles and depressions recently occupied by bogs and wetlands located on the surface of Numernes ridge as well as along it. The thickness of peat deposits in some of these bogs exceeds 5 m.

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THE SECOND DIURNAL DRIFT EXPEDITION ON THE MIDDLE DAUGAVA RIVER DURING THE SUMMER LOW-WATER PERIOD

On July 18–19, 2020, the second diurnal drift expedition was organized on the Middle Daugava River downstream from Daugavpils City by the Department of Environmental Science and Chemistry (Daugavpils University). The drift was performed according to the Lagrangian research method by applying a manned drifting research platform “Aventura” constructed at Daugavpils University in 2007. This drift expedition was aimed to study downstream transformation processes of physical and chemical properties and composition of the moving fluvial water masses in real time during the summer low-water period. During a continuous downstream drift, which lasted for 23 hours and covered about 38 km long distance, regular (hourly) measurements of main physical and chemical parameters of the selected fluvial water masses were conducted by a HACH multiprobe attached to

the platform. Simultaneously, the average drift speed, the depth and width of the riverbed, and the water column's transparency were measured also, and a pair of subsurface water samples were collected for the nutrient analysis at each site. In addition, geographical position of each sampling site was recorded. In total, 24 series of instrumental measurements were conducted, and 48 water samples were collected along the drift route. The obtained water samples were analysed for concentration of total nitrogen and phosphorus, as well as phosphates, nitrates, and ammonia. Instrumental data series were analysed by applying graphical and statistical methods, such as the Mann-Kendall test to reveal statistical significance of downstream trends. The results revealed significant linear trends of several physical and chemical parameters (CND, transparency, N-NO₃, etc.). Diurnal cycles in some other parameters (water temperature, oxygen concentration, chlorophyll-a content, pH) were discovered, probably related to the gas and energy exchange between the moving water masses of the Daugava River, the Sun, the phytoplankton and the atmosphere.

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THE STRUCTURE AND DENSITY OF CORNUS SEEDS IN THE SOIL SEED BANK IN LITHUANIA

The soil seed bank is a source of propagules and plays a key role in maintaining the stability of plant populations and their long-term survival. Research on the soil seed bank contributes significantly to the knowledge of species ecology and biology. Studies on the soil seed bank of an alien plant species provide information on the potential of its invasion in certain area. The aim of this study was to compare the seed bank structure of native and alien *Cornus* taxa occurring in Lithuania. We hypothesized that invasive *Cornus* taxa forms denser seed bank than native. Five sites of each *Cornus alba*, *C. sericea*, *C. sanguinea* subsp. *Sanguinea* and *C. sanguinea* subsp. *Australis* were selected for the study. Seeds were sampled using soil core method. We found that the soil seed bank formed by alien *C. sanguinea* subsp. *australis* was significantly denser (the density of intact seeds ranged from 185 ± 188 to 2280 ± 1217 seeds/m²) than that of native *C. sanguinea* subsp. *sanguinea* (ranged from 70 ± 114 to 820 ± 775 seeds/m²). The seed bank of alien *C. sanguinea* subsp. *Australis* contained more viable seeds than that of native *C. sanguinea* subsp. *sanguinea*. Alien *C. alba* also formed much denser seed bank than the native *C. sanguinea* subsp. *sanguinea*. However, the density of intact seeds in the seed bank of *C. sericea* was significantly lower (ranged from 150 ± 102 to 285 ± 315 seeds/m²) than the seed bank of both *C. alba* and *C. sanguinea* subsp. *australis*. Analysis of vertical distribution of seeds in the soil samples revealed that most intact seeds were accumulated in the upper soil layer. Strong correlation ($r = 0.73$; $r^2 = 0.53$; $p < 0.001$) between the seed remnants and intact seeds was found in the soil seed bank of *C. sanguinea* subsp. *australis*. Results of this study did not fully confirm our initial hypothesis, and we assume that this phenomenon was determined by a complex of plant biological properties and environmental factors.

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HOLOGRAPHIC MODEL OF MATHEMATICAL KNOWLEDGE STRUCTURE

Key words: *holographic principle, integral education, mathematical knowledge structure, levels of consciousness structure, spiral development model*

The article deals with the principle of constructing knowledge of mathematics, which is based on the theory of constructivism, contextualism and pluralism. The task of education is to promote the evolution of consciousness. Mathematics is one of the greatest achievements of human culture. The main features of mathematics, as an independent branch of science, are its abstractness, logical rigor and wide range of applicability. Mathematics is the science of numbers, of space, and of structures viewed in their purest form. Mathematics is a living entity in which consciousness develops. Everything that has happened before is important for the development of consciousness. It is supportive. From each point of the universe one can obtain information about the whole.

Research problem: Mathematical knowledge is unstable if it is based only on the upper levels, in order to work in mathematics, all lower levels of consciousness must be developed.

The aim of the research: to create a model of the spiral development of the structure of holographic knowledge of mathematics, so that the student can apply integrated knowledge, which is arranged in the system, considered in the structure and explains the processes taking place in the universe and the world.

The study describes the holographic model of the knowledge structure of mathematics, using the spiral development model of the structure of consciousness and the holographic human model.

The methods of achieving the research goal are the analysis of theoretical literature, experience and the results of pedagogical research.

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HEALTH CARE SCIENCE

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A CLINICAL CASE OF COMMON VARIABLE IMMUNODEFICIENCY (CVID) COMPLICATED WITH EARLY OSTEOPOROSIS

Key words: common variable immunodeficiency, CVID

Introduction: Common variable immunodeficiency (CVID) is a heterogenous immune disorder characterized by low IgG antibody count with low IgA and/or IgM, leading to recurrent (mainly bacterial) infections, chronic lung and gastrointestinal disease, autoimmune disorders, granulomatous disease and malignancies. Multiple factors, including malabsorption can influence bone health in CVID patients, leading to early osteoporosis.

Clinical case: A 60 y.o. man (BMI 18 kg/m²) was hospitalized due to lower gastrointestinal bleeding, without pain and fever. He reported recurrent airway infections and gastrointestinal problems since childhood. 10 years earlier severe osteoporosis was diagnosed. 2 years later gastric resection due to pylorostenosis was performed, no malignancy. A year later left hemithyroidectomy and upper parathyroidectomy was performed, no adenoma. At testing, WBC 32,000, Hb 7.96 g/dl, CRP 14mg/l [0-5], creatinine 140μmol/l [44-80], albumin 27.3g/l [35-52], Ca 2.05mmol/l [2.1-2.55], PTH 131.1pg/ml [15-68], euthyroid. Various antibodies were negative. Ulcerative colitis was seen in FCS, hepatosplenomegaly found. Chest CT scan showed bilateral bronchiectasis and multiple rib fractures of various age, leading us to question the origin of an early osteoporosis, in a setting of multiple chronic system involvement. CVID was suspected and confirmed by Ig testing: IgA 0.02 g/l [0.7-4], IgM 0.08 g/l [0.4-2.3], IgG 0.8 g/l [7-16]. Unfortunately, two months later he developed destructive pneumonia and died due to sepsis.

Conclusion: CVID can be difficult to identify due to multiple and diverse organ system involvement, a holistic view and full history is needed to solve the diagnostic puzzle.

Summary: This report describes a case of CVID, suspected due to early severe osteoporosis in a male patient (a rare complication) with history of gastrointestinal disease, recurrent airway infections and several autoimmune disorders.

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ACUTE NEUROLOGICAL CONDITION DURING PREGNANCY

Key words: posterior reversible encephalopathy, pregnancy, sensory disturbances, hemianopsia

Introduction: Posterior reversible encephalopathy syndrome (PRES) is characterized by a subacute neurological and radiological reversible picture. It appears due to a number of causes that contribute vasogenic cerebral edema. The most common clinical signs are headache, convulsions, nausea/vomiting, changes in vision, impaired consciousness and altered mental status that develop after exposure of provocative factor.

Case description: A 32-year-old pregnant woman (II progressive pregnancy 17 + 4 weeks) was hospitalized in an emergency center with complaints of mild headache on the right side, blurred vision and loss of vision on the left side, sensory disturbances on the left side of the body. Daily use of medication was denied, family history was negative.

After consultation of a neurologist was detected, that the patient had a homonymous hemianopsia on the left side, a mild left hemisindrome – mild pyramidal insufficiency on the left side, Babinska's symptom positive on the left side. The patient showed superficial sensory disturbances in the left side of the body. In a CT scan was formed ischemic zone with hemorrhagic imbibition in the ACM dextra pool, formed ischemic zones in the ACP dextra pool. In MRI was edema of the right hemisphere of the brain in the back of the *corpus callosum*, in the back of the midbrain. The patient was prescribed antihypertensive therapy with further improvement in health condition.

Summary: This case describes rare disease – PRES– and demonstrates that it could be hard to diagnose and could be successfully treated if diagnosis is confirmed as soon as possible with no complications for patient an her pregnancy.

Conclusions: This case report highlights the seriousness of acute hospitalization of patients with simmlar symptomatics, particularly in patients with pregnancy. PRES is a life threatening condition which requires extensive systemic evaluation, careful neurological function monitoring and rapid treatment.

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ANALYSIS OF NON-PHARMACOLOGICAL SECONDARY PREVENTION IN PATIENTS AFTER PRIMARY PERCUTANEOUS CORONARY INTERVENTION DUE TO ACUTE CORONARY SYNDROME

Key words: secondary prevention, ACS post-treatment, clinical pharmacist intervention

Introduction. Secondary prevention of cardiovascular events is very important in reducing morbidity and mortality in patients after ACS. Studies have shown the effectiveness of life style changes and pharmacotherapy in improving patient prognosis. Low adherence to secondary prevention recommendations is associated with an increased risk of mortality and re-hospitalization. Major study results reveal a 36% reduction in mortality in patients who quit smoking. Large cohort studies have shown that added sugar intake that exceeds 10% of daily calories is associated with increased mortality. Special workout training as part of a cardiac rehabilitation program is associated with a 22% reduction in mortality.

The aim of the study is to analyze secondary prevention measures in patients after primary percutaneous coronary intervention (PCI) in acute coronary syndrome (ACS).

Materials and methods. A prospective longitudinal observational study examined 34 patients after primary PCI with DES implantation for ACS. The average duration of the study was 7 months. During the study, patients had five subsequent contacts with the clinical pharmacist in order to conduct a patient survey during the outpatient treatment period.

Study results. 64% of the patients have quit smoking while the rest of the study participants have been able to reduce the number of cigarettes smoked per day by at least 50%. 4 patients who quit smoking have shown an average weight gain of 6 kg over 6 months 21% of the patients received specific dietary recommendations in their discharge summary, while 9% of the patients received nutritionist counseling in health centers. 35% of the patients were still observing the prescribed diet at the end of the study. At discharge, 2 patients received written recommendations for the frequency and duration of physical activity and 2 patients (6%) were qualified for a cardiac rehab program. 18% of the patients have completed a cardiac rehab program.

Conclusion. Lifestyle changes and pharmacotherapy are insufficient in the study patients, which is reflected in failure to achieve target values. The results of the study can be used to increase the effectiveness of secondary prevention measures after ACS, which requires further research.

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ANEMIA DURING PREGNANCY - DIAGNOSIS, TREATMENT METHODS

Background. Anemia is found in 24.8% of the population and typical patient with anemia is pregnant woman (pregnancy is a risk factor for development of anemia mostly due to increased iron use). According to World Health Organization (WHO) 2020 data, approximately 40% of pregnant women have iron deficiency anemia. In Latvia, in 2016, anemia occurred in 25.13% of women of reproductive age.

Aim. The aim of this study was to find out how often anemia is diagnosed among pregnant women, what diagnostic criteria are taken into account and how anemia is being treated.

Methods. Retrospective study, that was performed in Pauls Stradiņš Clinical University Hospital from December 2020 to March 2021, collecting data from 43 medical records. All data was summarized and analyzed using Microsoft Excel. SPSS 20 was also used for data analysis. The diagnosis of anemia was based on lowered hemoglobin level below 110 g/l in the first trimester, below 105 g/l in the second trimester and below 110 g/l in the third trimester or ferritin level below 30 ng/ml in any of the trimesters (latent iron deficiency).

Results. Mean maternal age was 37 (range 21 to 45 years). Out of all 43 women, 2 had anemia before pregnancy (4.7%). 20 women (46.5%) were diagnosed with anemia during pregnancy. Diagnosis was made based on ferritin level in 16 cases (80%), on hemoglobin level in 2 cases (10%) and both diagnostics criteria were taken into account in 2 cases (10%). In 7 from 22 cases (32%) of anemia (diagnosed pre-pregnancy and during pregnancy) women were treated with iron (II) gluconate and in 6 cases (27%) – with iron (II) fumarate.

Conclusions. Almost 50% of pregnant women in this study were diagnosed with anemia or latent iron deficiency during pregnancy and in most cases (80%) diagnosis was made based on lowered ferritin levels. Iron (II) gluconate or fumarate were two most frequently used medications of choice in treatment of anemia or latent iron deficiency.

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ASSESSMENT OF REASONS AND SUGGESTIONS FOR PURCHASING AND PROPHYLACTIC USE OF MEDICATIONS AND DIETARY SUPPLEMENTS AMONG HEALTHY SOCIAL MEDIA USERS IN LATVIA DURING COVID-19 PANDEMIC

Key words: COVID-19, self-medication

Introduction. Since the beginning of COVID-19 pandemic, misleading information appeared on the use of medications to prevent and treat SARS-CoV-2 infection.

Aim. To assess the reasons and suggestions for purchasing and prophylactic use of medications and dietary supplements among healthy social media users in Latvia during COVID-19 pandemic.

Materials and methods. In this study 330 respondents participated in an online survey. Questions were about habits, reasons, and suggestions for purchasing and prophylactic use of medications and dietary supplements while having no symptoms and no illnesses requiring treatment. Medications were grouped as: dietary supplements, homeopathic and herbal remedies (Group I), cough, cold, nasal and throat preparations (Group II), non-prescription anti-inflammatory, analgesics, antipyretics (Group III), antibiotics (Group IV). Data was analyzed in IBM SPSS Statistics 26.

Results. While being asymptomatic, 51.2% of respondents purchased Group I preparations, whereas Group II, Group III and Group IV medications were purchased by 13.9%, 30.3% and 2.1% of respondents, respectively. For Group I preparations, the most popular reason for purchasing was prophylactic use, but for Group II, Group III and Group IV medications – regular home medicine supplies. Concern of pharmacy shortages was a common reason for purchasing Group II, Group III and Group IV medications. Most frequently used group for prophylaxis was Group I. Most of the respondents made decision to purchase and prophylactically use medications by themselves, and with suggestions from a family doctor, other speciality doctors, acquaintances, and internet sources.

Conclusions. Most popular reasons for purchasing medications and dietary supplements were to stock home medicine cabinet, use for prophylaxis, and concerns of pharmacy shortages. Mainly, it was a self-made decision with suggestions coming from physicians, acquaintances, and the internet.

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ASSOCIATION ANALYSIS OF INTERGENIC POLYMORPHISM OF THE HLA LOCUS AS A POSSIBLE MOLECULAR MARKER OF BRONCHIAL ASTHMA IN A CASE / CONTROL STUDY IN THE LATVIAN POPULATION

Background. Bronchial asthma (BA) is a chronic inflammatory, genetically complex, heterogeneous disease. Specific genes or gene combinations that could be used in the early diagnosis of BA have not yet been identified. Human leukocyte antigen (HLA) genes encode functionally important proteins, that are responsible for regulating the immune system. Mutations in intergenic region of this locus can affect the regulatory functions of the genes in the way the immune system works. The studied SNP rs9275596 (chr6:32713854) is localized between the HLA-DQB1 and HLA-DQA2 genes. Full genome studies have shown that this SNP is significantly associated with the risk of various autoimmune diseases (Sawcer et al., 2011) and was found to be in association with multiple sclerosis in Latvians (Paramonova et al., 2020).

Aim. The study was aimed at determining the potential association of SNP rs9275596 located in the human leukocyte antigen locus with bronchial asthma in Latvian children.

Methods. The case/control group included 117 children diagnosed with asthma and 208 individuals without asthma and any other autoimmune and chronic disease/condition. The rs9275596 were genotyped by restriction enzyme site polymorphism on BA main and sex-specific association. Statistical analysis was performed with SPSS.25 Statistical Package. The χ^2 tests was used to determine the association with the disease and the difference between the results in two groups; odds ratio was used to determine clinical significance.

Results. In both MS and Latvian population cohorts, the SNP rs9275596 genotyping call rate was 100%, and the marker was found to be in the HWE ($p > 0.05$). Statistical analysis revealed a statistically significant association with BA for common allele genotype TT (OR = 2.63, CI 95% [1.18–5.86]). The heterozygote genotype TC and rare allele C were found to be clinical protective factors in affected women (OR = 0.37, CI 95% [0.15–0.92]) and OR = 0.49, CI 95% [0.25–0.94], respectively).

Conclusion. We present evidence that the intergenic SNP rs9275596 of the HLA locus may contribute to the risk of bronchial asthma in Latvian children, and thus plan to analyse the interaction of this polymorphism with the clinical characteristics of BA in future studies.

Acknowledgements/Funding. The study was funded by the Mutual Funds Taiwan – Latvia – Lithuania cooperation project “Comparative study of vitamin D and its receptor gene polymorphisms in Lithuanian, Latvian, and Taiwanese children and adults with atopic dermatitis and asthma”.

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ASSOCIATION OF SYMPTOMS OF DEPRESSION WITH LIPID LEVELS IN THE POPULATION OF MIDDLE AGED AND SENIOR PATIENTS WITH CARDIOVASCULAR DISEASES IN PRIMARY CARE PRACTICE

Key words: depression, Serum lipid levels, PHQ-9

Introduction. Cholesterol is a known risk factor for cardiovascular disease, however, recent studies have shown an association between lipid levels and depression symptoms. Low levels of serum LDL cholesterol has been associated with increased risk of developing depressive symptoms in postmenopausal women.

The aim of this study was to determine an association between serum lipid levels and depression symptoms in the population of middle aged and senior patients with known cardiovascular disease in the setting of primary care practice in Riga.

Methods. The study examined 51 patients with cardiovascular diseases from General Practitioner (GP) practice in Riga. Data collection consisted of two parts – PHQ-9 scale was used for the quantitative assessment of depression of the participants and data from patients cards was obtained including the laboratory results of lipid panel (total cholesterol, LDL cholesterol and triglycerides). Data was analyzed using MS Excel and IBM SPSS Statistics 26.

Results. 20 women (39.2%) and 31 men (60.8%) were included in the study with the average age of 66.1 years. Symptoms of depression had 42 patients (82.35%): 25 (49%) – mild depression symptoms, 14 (27.5%) – moderate depression symptoms, 1 (2%) moderately severe depression symptoms and 2 (3.9%) – severe depression symptoms. A moderate negative correlation was found between depression score and low-density lipoprotein cholesterol level in plasma ($r_s=-0.637$, $p<0.01$) and total cholesterol levels ($r_s=-0.674$, $p<0.01$). No association was found between depression score and triglyceride levels.

Conclusion. This study demonstrated that lower levels of low-density lipoprotein cholesterol and total cholesterol levels were found in patients with depression symptoms than in those without. The prevalence of depression symptoms in middle aged and senior patients with cardiovascular diseases are high and routine depression assessment should be introduced in the visits of patients in primary care.

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AWARENESS OF ADOLESCENTS ABOUT HEARING IMPAIRMENT, RISK FACTORS, AND HEARING PROTECTION MEASURES

Key words: awareness, ear health, adolescent

Introduction: According to the World Health Organization (WHO), there are approximately 466 million people with disabling hearing loss. Thirty-four million of them are children and adolescents. Increasing levels of disabling hearing loss become a global public health problem. It is imperative to evaluate the understanding of adolescents.

Objectives: The objective of this study consists of measuring adolescent awareness of hearing impairment, risk factors, and protective measures. Besides, we aim to inform adolescents so that they are more knowledgeable.

Materials and methods: We designed an anonymous multiple options questionnaire, focusing on four domains: the effect of overexposure to loud sounds and noise, underestimated ear symptoms leading to diagnostic delay, knowledge of infant hearing loss, management of ear cleaning, and treatment.

Results: The study included 122 contestants – 36 (30%) men and 86 (70%) women. The contestants' age group is 13–20 years (mean age 16.28, SD ±1,71). The median score of knowledge was found to be nine, with a total possible score of thirteen. The majority of participants (44,2%) got scores less than or equal to nine. 69% of all contestants know that slap on the ear with an open hand cause hearing impairment. 73% are familiar with the fact that cotton buds not necessary for ear cleaning. 66% of all the participants are acquainted that listening to music with headphones for more than 3 hours leads to hearing loss; nevertheless, 77% of them used to hearing the music for more than 3 hours.

Conclusion: The outcome reveals that the understanding of hearing impairment, risk factors, and hearing protection measures are moderate. There are not enough educational activities in schools on this issue. It's essential to increase the number of instructional projects to improve adolescent knowledge of the topic to change the situation.

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BODY FOCUSED REPETITIVE BEHAVIOR PREVALENCE AND ASSOCIATION WITH ANXIETY

Introduction. Body-focused repetitive behavior (BFRB) is a group of self-destructive habits, like nail and cuticle biting, which is practiced regularly.

Objectives. Aim of research is to find prevalence of different BFRB habits and their connection with anxiety in research group.

Materials and methods. Rīga Stradins University students were surveyed among different faculties in relation to the frequency of BFRB traits and anxiety levels after the survey (Spilberger, 1983, adapted in Latvian language by D. Škuškovnika). Data was processed using SPSS and Excel.

Results. 133 respondents were analyzed, 113 women and 20 men.

In total 12,4% had none of the habits (n=17), 40,9% (n=56) with atleast one subclinical habit, but without any pathological habit 43,8% (n=60) with atleast one pathological habit. Most common habit was lip biting 52,2% (n=70), cuticle picking 45,5% (n=61), skin picking 39,6% (n=53), cheek chewing

35,8% (n=48), nail picking 29,9% (n=40), skin biting 29,1% (n=39), hair pulling 20,9% (n=28) but most rare was grinding of teeth 6% (n=8).

Respondents with pathological habits had a higher anxiety levels than those without ($p < 0,001$), likewise for the respondents with atleast one subclinical habit and atleast one pathological habit ($p < 0,001$). Respondents with none of the habits were noted to have a lower anxiety levels (T state $p < 0,004$, T trait $< 0,001$). Dividing the study group in those who are clinically healthy and those with clinically significant anxiety, group with pathological habits is noted to have a significant association with anxiety (T state $p < 0,002$, T trait $p < 0,001$).

Conclusion.

1. BFRB traits are commonly seen in the study group.
2. Respondents with atleast one pathological trait have higher levels of anxiety.
3. Respondents with zero traits have a lower level of anxiety.
4. Respondents with a pathological BFRB habit have a higher incidence of clinically significant level of anxiety.

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BREAST CANCER TRENDS IN LATVIAN ONCOLOGY CENTRE FOLLOWING THE INTRODUCTION OF BREAST CANCER SCREENING IN LATVIA: COMPARISON OF 2010 AND 2017

Background. Breast cancer has been the most frequently diagnosed oncological disease in women in Latvia for years. In response to such trend, in 2009, a national breast cancer screening was introduced in Latvia for women aged between 50–69 years.

Aim. The current study aims to assess the breast cancer trends in women in Latvia, following the introduction of national breast cancer screening. It compares the number of breast cancer cases and the stage of cancer in the moment of detection in 2010 and in 2017.

Methods. The study investigated personal medical histories available at the Latvian Oncology Centre. In total, 229 patients aged between 50 and 69 years diagnosed with breast cancer for the first time were selected. Patients were divided into 2 groups – those who were diagnosed with breast cancer in 2010 and those who were diagnosed with breast cancer in 2017.

Results. In 2010, 95 registered patients were diagnosed with breast cancer. Of these, 2 patients (2.1%) were diagnosed *in situ*, 25 patients (26.3%) with stage I, 44 patients (46.3%) with stage II, 24 patients (25.3%) with stage III. According to the data, there were no patients diagnosed with stage IV in 2010.

In 2017, 134 patients were diagnosed with breast cancer. Of these, 6 patients (4.5%) were diagnosed *in situ*, 42 patients (31.4%) with stage I, 55 patients (41%) with stage II, 29 patients (21.6%) with stage III, and 2 patients with stage IV (1.5%).

Conclusions. The study has shown that during the seven-year period of national breast cancer screening, early detected breast cancer cases have increased, while lately diagnosed breast cancer cases have decreased. Hence, it can be argued that breast cancer screening has had a positive impact on the early cancer detection and the breast cancer tendencies at large. Consequently, the study has confirmed an overall effectiveness of the screening, which points at high value of such screening programmes in respect to the public health.

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CARING FOR MENKES SYNDROME PATIENT IN FAMILY PHYSICIAN'S PRACTICE

Key words: Menkes syndrome, genetic disorder, Copper metabolism, epilepsy, cerebral degeneration

Introduction. Menkes syndrome is a congenital X-linked genetic disorder with an incidence of approximately 1:100,000 live births. The clinical picture is caused by a defect in copper transporting ATPase (A TP7A) gene. Disease is characterised by progressive neurologic degeneration with psychomotor deterioration, seizures and death during early childhood.

Case description. We report you a rare genetic disease that started with unspecific feeding problems and low muscle tonus, but turned out to be Menkes syndrome. A new-born (23 days) was referred to Children's Clinical University Hospital because of poor feeding and lack of daily activities. An infection was suspected, but not confirmed. The patient was the first child of two healthy parents. He was born at 39 weeks of gestational age by physiological vaginal delivery (birth weight 3,8 kg, height 53 cm, head circumference 35 cm) and had bilateral parietal cephalohematomas. During the pregnancy the patient's mother had positive GBS in urinary analysis. No relatives with genetic disorders have been reported in the family tree. Patient's early development was age appropriate for the first 4 months, and then regressed. There is a documented history of gradual onset of hypotonia and delayed psychomotor development since reaching 4 months of age. First of all, neck and shoulder muscle tonus was low. At 5 months of age, he was referred to hospital because of infantile spasms and epileptic seizures up to 10 times a day. MRI showed some changes in the brain structures. Neurologist referred the patient to genetician as treatment with antiepileptics (including vigabatrin) did not control the symptoms. Genetic testing was remarkable for increased HVA (homovanillic acid) / VMA (vanillylmandelic acid) ratio (7.76; ref.<4) that could be associated with Menkes syndrome. At 10 months of age the patient was consulted by another genetician (from Russia) and, considering the infantile spasms, developmental problems and changes in EEG, was diagnosed with the West syndrome. After 6 months of age, the molecular genetic testing showed mutations in ATP7A gene-15. A mutation patoghene and definitive diagnosis – Menkes syndrome – was set. Patient repeated the amino acid test in urine analysis, and HVA/VMA ratio was even higher than last time (10.2; ref.<4.0). Patient had typical hair that is associated with Menkes syndrome-rare, white, sparse and brittle. The look and texture of the hair resembled steel. An investigation at 1 year and 4 months showed decreased serum ceruloplasmin (0.04 g/l; ref. 0.18–0.45g/l) and copper (<3 µg/dl; ref. 64.2–100.1 µg/dl). Copper in 24h urine was 36 µg/dl (below 30 µg/dl). Despite the anticonvulsant therapy using various drugs (depakine, topiramate, vigabatrin, diazepam, midazolam), the intractable seizures continued. At the end of the first year of life, neurological milestones such as head control, rollover response had not been achieved. In his second year of life the boy was diagnosed with bladder diverticulum and had recurrent urinary tract infections. The patient had 2 bone fractures. When the patient was 3 years and 6 months old, he developed heart and kidney failure, the intractable seizures continued, and the patient died when he was 4 years old. Parents of the patient admit that early diagnosis of Menkes syndrome is essential, despite there not being a specific treatment in place. This allows them to avoid stressful days of uncertainty. Conclusions. Early diagnosis is difficult because the patients are asymptomatic or don't have specific symptoms in the first months of life. Family physicians can play an important role in recognising diseases by combinations of subtle and/or non-specific signs such as failure to thrive, delayed psychomotor development, unusual hair and infantile spasms. The urine HVA/VMA ratio could be a useful screening method for Menkes disease.

Summary. This case presents a rare genetic disease characterised by neurological degeneration, epilepsy, hair abnormalities and developmental delay that primarily affects men. Patients die in their childhood. Family physicians can facilitate rare disease's early referral and diagnosis.

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CAUSE AND SEVERITY OF INJURY ACCORDING TO ISS IN POLYTRAUMA AT RIGA EAST UNIVERSITY HOSPITAL “GAILEZERS”

Aim. The aim of the research was to compare injury mechanisms and injury severity in polytrauma patients admitted to biggest polytrauma unit in Latvia – Riga East University Hospital “Gailezers”.

Background. Polytrauma is a combination of two or more anatomical region injury provided that at least one of injuries is life-threatening and ISS score is more than 16.

Methods. Statistical analysis of data was performed using IBM SPSS. Data was collected from January, 2020 to December, 2020. In total, 352 patients were included in the study. All patients were divided into eight groups – fall from the height and stairs, hit by a train, beaten, injurious fall severity, explosion, unknown circumstances and traffic accidents, which were further divided into six subgroups (pedestrian struck by vehicle, driver, passenger, motocyclist, cyclist and unknown traffic member). Injury Severity Score (ISS) was admitted into three groups: 1st group ISS lower than 20 points; 2nd group ISS 21 to 50 points; and the 3rd group ISS more than 51 point.

Results. Detailed analysis were performed only on three most common injury mechanisms. Most common being fall from height (n=89) that caused musculoskeletal injuries in 97.75% of cases, neurotrauma in 50.56% of cases and visceral trauma in 44.94% of cases. Pedestrians struck by vehicle (n=60) have acquired musculoskeletal trauma in 91,67%, neurotrauma in 48.33% and visceral trauma in 38.33% of cases. However unknown traffic member (n=52) had musculoskeletal injuries in 96.15%, neurotrauma in 40.38% and visceral trauma in 57.69% of cases.

In ISS 1st group were 68.18% (n=240) of patients, in 2nd group were 27.56% (n=97) of admitted patients and in 3rd group only 4.26% (n=15) of patients. In 24 patients there was exitus letalis, which results in 6.82% mortality rate, half of these patients ISS were over 51 points.

Conclusion. The most common injury mechanisms was fall from height, followed by a pedestrian struck by vehicle and unknown traffic members. Most common injuries were musculoskeletal and neurotrauma. Almost one-third of all the patients included in the study, ISS was lower than 20 points.

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CHARACTERISTICS OF INTELLECTUALLY DISABLED OFFENDERS CONVICTED OF VIOLENT CRIMES

Background. Objective assessment of sexual deviancy and future community violence risk is crucial for special prevention in population of convicts with intellectual disabilities.

Aim. To evaluate practices of risk assessment and to give the characteristics of the convicts with marked intellectual disability, who committed serious crimes.

Methods. Medical, criminal, and penal characteristics of seven convicts are given.

Results. Physical assaults (Cases 1 to 6) were unplanned, not related to robbery and majority of them (57%) were alcohol – related (compulsory measures of social and psychosocial rehabilitation were not appointed). In two cases the assault resulted in death of a victim and convicts had a history of incarceration: in Case 1 (for infliction of great bodily injuries) and Case 2 (a convict with IQ 48 had served prison sentence 3 times (including murder) and committed murder in 6 months since release from prison). In two cases (Case 3,4) the convicts had history of recent administrative penalty. In one

case (Case 5) the assault was committed during the application of compulsory measures of a medical nature.

No defendants had insanity defense or had a representative. None of the convicts had an objective assessment of repeated offence risk; the sexual offender (Case 7 – long term sexual abuse of a child) did not have a sexual recidivism risk assessment.

Conclusion. The utilization of violence and sexual recidivism risk assessment scales, assignment of compulsory measures of social and psychosocial rehabilitation, assignment of representative in criminal proceedings appear to be underused in Latvia.

The compulsory measure of medical nature was inefficient in prevention.

Prison sentence was inefficient in preventing manslaughter in repeat offender with marked intellectual disability.

Further research is needed to establish if administrative offences can be a predictor of violence offence in intellectual disabled population.

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CHILDHOOD EXPERIENCE AND BORDERLINE PERSONALITY DISORDERS IN PSORIATIC PATIENTS

Key words: *psoriasis, childhood experience, personality states (disorders), alexithymia*

Many psychiatric disorders are associated with psoriasis. Certain psychiatric conditions may be manifested due to influence of chronic cutaneous diseases. On the other hand, psoriasis can be controlled or it can progress because of patients mental state, making a vicious circle. Childhood experience influences the development of personality (weaknesses and resources), it interacts with somatic diseases, for example, psoriasis. Both alexithymia and personality disorders can affect patient's perception of illness and its treatment. There is no research about childhood experience, personality disorders and alexithymia in Latvia. Research plan: 1. Alexithymia, dominant childhood experience and personality disorders assessment in patients with psoriasis; 2. Association of childhood experience with alexithymia in patients with psoriasis; 3. To assess the association of personality disorders with alexithymia in patients with psoriasis; 4. To assess the association of childhood experience with personality disorders in patients with psoriasis.

Materials and methods: During this research an anonymous questionnaire was published in social network "Facebook" Psoriasis support group, with Google: anonymous research forms. A retrospective study was performed, analyzing 50 research forms answered by adults with psoriasis: Toronto Alexithymia Scale (TAS20) – Alexithymia assessment; Borderline Personality Inventory scale – personality states (disorders) assessment; Childhood Experience Questionnaire – childhood experience assessment. Data analysis and its compiling was made using Microsoft Excel, IBM SPSS Statistics 26.0 programmes. Research level of relevance $p < 0.05$.

Results: A study included 50 patients with psoriasis: 40 females (80%) and 10 males (20%). The average age of respondents was 33.3 years ($SD=8.68$). Negative, traumatic events during childhood experienced 52% of patients, the prevalence of personality disorders was 12%, alexithymia – 24%. 66,67% of patients with alexithymia had negative childhood experience. 33,33% of patients with alexithymia had personality disorders.

Conclusion: Alexithymia was associated with childhood experience as well as with personality disorders in patients with psoriasis. However, that does not mean that patients psoriasis is associated with childhood experience, which can cause personality disorders and alexithymia in the future.

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CLINICAL CASE OF RENAL CELL CARCINOMA IN AUTOSOMAL DOMINANT RENAL POLYCYSTIC KIDNEY DISEASE

Key words: renal cell carcinoma, dialysis, Autosomal dominant renal polycystic kidney

Introduction: Autosomal dominant polycystic kidney disease is the most common inherited kidney disease, which slowly progresses to end stage renal disease, and the eventual need for renal replacement therapy. Common complications of ADPKD are pain, cyst haemorrhage, cyst infection, nephrolithiasis. There are discussions about renal cell carcinoma prevalence among ADPKD patients. There are no large controlled randomised trials, but some small case series and observational studies exist.

Clinical case: A 56-years old man with a history of autosomal dominant renal polycystic kidney disease, hypertension and four months on chronic haemodialysis, hospitalized in regional hospital, with first time developed macrohematuria. Macrohematuria in urine sample was proved and urine cytological evaluation was assigned. Three samples of urine cytological examination was done, and malignant cells were not found. Performing fibrocystoscopy, pathological structures in urinary bladder, and ureters were not found. To find out the cause of gross macrohematuria, computed tomography was performed. Computed tomography showed contrast accumulated hypervascular tissue with total size – 12,5x8,5x9 cm with specific paraaortal lymphadenopathy. Surgical operation was performed and right side nephrectomy was done. Clear-renal cell carcinoma with wide haemorrhagic necrosis was proven in histological examination. According to TNM classification T2BN0M0 stage was approved. Dynamic observation was recommended after right side nephrectomy. After 3 months computed tomography was not done as doctor was recommended but after one year CT was performed, relapse was not found.

Conclusion: Renal cell carcinoma among autosomal dominant renal polycystic kidney disease is quite rare, but all macrohematuria episodes have to be examined. Early diagnosis improves patient prognosis and quality of life.

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CLINICAL MANIFESTATIONS OF AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE IN ELDERLY PATIENTS: WHAT ARE THE DIFFERENCES WITH YOUNGER PATIENTS?

Key words: polycystic kidney disease, arterial hypertension, urinary tract infections

Objectives: Autosomal dominant polycystic kidney disease (AD PKD) is a multisystemic and progressive hereditary disorder. AD PKD clinical manifestations are highly varied and age-related, including renal and extra-renal features. The aim of the study is to compare the most common clinical manifestations of the disease between the two age-groups: younger than 65 years old and subjects aged 65 and older (elderly group).

Materials and Methods: A retrospective study was made including 90 patients with AD PKD from Pauls Stradins Clinical University Hospital outpatient clinic. Data were collected from ambulatory cards and were analyzed by IBM SPSS Statistics version 26.0 (p<0.05). The study was approved by the Institutional Ethics Review Board.

Results: Overall, 39 (43.3%) of patients were aged 65 and older, compared with 51 (56.7%) of patients younger than 65 years old. The most common clinical manifestation in both groups was chronic kidney disease, which was present in all the patients. Arterial hypertension presented in 94.9% of

elderly patients and 80.4% among patients younger than age 65 years. Recurrent UTI 64.1% of elderly patients and 33.3% in patients younger than age 65 years. Renal transplantation was done in 97.4% of elderly patients and 92.2% in patients younger than age 65 years. The most common extra-renal manifestation in elderly patients was liver cysts, which was present in 97.4%. Liver cysts 86.3% in patients younger than age 65 years. Statistically significant differences between study groups were found in the frequency of arterial hypertension ($\chi^2(1,N=90)=4.01$, $p=0.045$), UTI ($\chi^2(1,N=90)=8.4$, $p=0.004$), diverticulosis ($\chi^2(1,N=90)=5.65$, $p=0.017$), hernias ($\chi^2(1,N=90)=8.38$, $p=0.004$) and common bile duct dilatation ($\chi^2(1,N=90)=5.47$, $p=0.032$).

Conclusions: The most common renal manifestations of autosomal dominant polycystic kidney disease in both groups are chronic kidney disease and secondary arterial hypertension, although the frequency of arterial hypertension tended to be higher in elderly patients than patients younger than age 65 years. The most common extra-renal manifestation in both groups is liver cysts, but not statistically significant difference was found between study groups.

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CLINICAL SYMPTOMS, CRANIAL NERVE INVOLVEMENT AND DIAGNOSTIC BIOMARKERS IN PATIENTS WITH NEUROSARCOIDOSIS

Background. Sarcoidosis is a multisystem inflammatory disease which is characterised by the formation of non-caseating granulomas in a multitude of organs. Central nervous system involvement is reported in about 5–10% of sarcoidosis patients where it can be a major diagnostic challenge due to a plethora of clinical symptoms, and lack of specific diagnostic biomarkers.

The aim of this study was to compile and analyse data pertinent to the clinical symptoms, involved cranial nerves and diagnostic approach among the patients diagnosed with neurosarcoidosis (NS).

Methodology. In this retrospective study, data from 25 patients diagnosed with probable NS were analysed. The subjects were included in the study after a histological confirmation of sarcoidosis, accompanied by MRI based evidence compatible with NS. The most commonly used biomarkers were angiotensin converting enzyme (ACE), total serum calcium level, and 24-hour urinary calcium. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were also analysed. By using MRI data, affected cranial nerves were studied. Clinical manifestations were subdivided into non-specific and neurological symptoms.

Results. The results of this study showed that clinical features of sarcoidosis were mostly non-specific. Most often, the patients suffered from headaches (64%), dizziness (36%), paresthesias (32%), vision problems (32%), dry cough (29%), fatigue (24%) and facial pain (16%).

The most specific laboratory tests for NS patients were ACE (elevated in 43% patients), and 24-hour urinary calcium levels (elevated in up to 25% of patients).

Cranial nerves were lesioned in 18 patients (72%). The most commonly affected nerves were optic (52%), facial (16%), vestibulocochlear and trigeminal (12%) nerves.

Conclusion. This study documents a poor specificity of ACE and 24-hour urine calcium levels for securing a diagnosis of sarcoidosis. Furthermore, an extensively variable clinical presentation shows that NS can easily mimic other disease processes, thereby rendering the diagnosis a difficult feat to achieve. Suspicion of NS can be made only if a patient has histologically proven systemic sarcoidosis, and shows some kind of neurological symptoms. In other cases however, NS is often a diagnosis of exclusion.

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COMMUNITY ACQUIRED PNEUMONIA INDUCED SEPTIC SHOCK. RETROSPECTIVE ANALYSIS OF THERAPY IN INTENSIVE CARE UNIT

Objectives: To assess if there is difference in used vasopressor dose and administered i/v fluid volumes in different time periods during first three days of intensive care unit (ICU) stay.

Materials and Methods: Retrospective study of 21 ICU patients with community acquired pneumonia (CAP), shock, hyperlactaemia and comorbidities was performed. Two groups were formed. First included 10 patients who survived and second non-survivor group included 11 patients. Patient medical histories were used to gain information about their diagnosis, laboratory results, treatment and result of treatment. IBM SPSS Statistics 26.0 was used for statistical analysis.

Results: Non-surviving group was statistically older than survivors group ($p=0,048$). Similar fluid volumes in all time periods during first three days were administered in both groups. Surviving group received smaller vasopressor doses and in dynamic doses were lowered contrary in non-surviving group where doses were initially higher and weren't reduced as much as in surviving group. Initial lactate levels in surviving group were lower and reduced more than in non-surviving group.

Conclusions: Age is important prediction factor for the result of hospitalisation. No statistically significant difference was found between administered fluid volumes during first three days in ICU. CAP patients with comorbidities acquired less fluid volumes than Surviving Sepsis Campaign recommends. At the end of the second day statistically significant difference between vasopressor dose change in dynamic was observed. Initial lactate levels and dynamic change of lactate could be used to predict the outcome of the treatment.

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CONSEQUENCES OF THE USE OF HAND SANITIZERS DURING THE COVID-19 PANDEMIC

Key words: hand sanitizers, contact dermatitis, moisturizing creams, COVID-19

Actuality of theme. Particularly in situations like COVID-19 pandemic outbreak, it is crucial to interrupt the transmission chain of the virus by the practice of proper hand sanitization. The frequency of hand disinfection and risk of developing contact dermatitis increases. Excessive use of alcohol based sanitizer increased permeability of skin and deprives oil and water from skin and leads to skin roughness and irritation.

Objectives. The aim of this study is to explore how often hand disinfection is performed, what kind of and how many hand skin problems it causes. What is the relationship between disinfectant, moisturizing cream and hand skin problems. Is there some relation between respondents' education level and hand disinfection events.

Materials and methods. The study included 242 people, interviewed about hand disinfection habits in COVID-19 conditions using an anonymous questionnaire and analyses of obtained data was carried out.

Results. 192 women and 50 men were interviewed. 59% develop hand skin problems after using disinfectants. The observed hand skin problems were 49% dry hand skin; 9% other changes; 21% dry hand skin, cracking; 8% dry and inflamed hand skin; 11% dry hand skin, inflamed, cracking. When using an alcohol-based disinfectant, the dry skin of the hands was 56%, non-alcoholic 45.5%, alcoholic and non-alcoholic 35%. Of the respondents who used hand moisturizers only occasionally after hand disinfection, hand skin problems developed in 71% of cases. Hand disinfection performed 66% of respondents with primary education. In these results p is less than 0,05.

Conclusion. Hand skin problems are more common in those respondents who sometimes use moisturizing hand skin cream than in those who do not. Hand disinfection is more often avoided by persons with primary education. The most common hand skin problem is dry hand skin and is caused by alcohol-based disinfectants.

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CURRENT PROBLEMS OF UROGENITAL SYSTEM IN POSTMENOPAUSAL WOMEN - LITERATURE REVIEW AND PATIENTS SURVEY IN FAMILY DOCTOR'S PRACTICE

Key words: postmenopause, urinary incontinence, pelvic organ prolapse, vaginal dryness

Introduction: Menopause is a physiological process that every woman is going to experience during her life, however in some women, it has potential to lead to various pathological complications. Given that the life expectancy of women living in Latvia is increasing, the number of lived years after onset of menopause has also increased. It is therefore important to acknowledge the leading postmenopausal problems associated with the urogenital system, which include urinary incontinence, vaginal dryness, pelvic organ prolapse, dyspareunia.

Aim: The aim of the research is to find out the prevalence of urogenital symptoms in postmenopausal women, its severity and impact on quality of life, and to assess women's attitudes consulting a physician.

Subjects: 78 postmenopausal women aged 54 - 84 participated in the study. Data were collected from January 2021 until February 2021. Data was analysed using Microsoft Excel 2010 and SPSS 26 were used for data collection and statistical processing. Chi Square and Fisher's Exact tests were used for data analysis.

Results: Research included 78 women at the mean age of 65,17 (SD 7,47; range 54-84). The average age of menopause was 50,13 (SD 2,55), the median age was 50,00 (Q1; Q3 48,00;52,00). The majority of women discussed menopause onset with a healthcare professional (62/78; 79.5%). Of these women, 80.7% (50/62) have discussed menopause with their gynaecologist, 16.1% (10/62) with their general practitioner, 3.2% (2/62) with another medical practitioner. In postmenopause hormone replacement therapy was used only by 7,7% (6/78) women. The prevalence of urogenital pathologies such as urinary incontinence affected 29.5% (23/78) of postmenopausal women, of whom 21,7% (5/23) had urge incontinence, 78.3% (18/23) had stress incontinence. Pelvic organ prolapse affected 19.2% (15/78) of postmenopausal women. Vaginal dryness affected 52.6% (41/78) of postmenopausal women. Sexually active were 67.9% (53/78) of postmenopausal women. 65.4% (51/78) of postmenopausal women reported, that urogenital symptoms have an impact on their quality of life, but only 15,38% (12/78) went to see a healthcare provider. Of these women, 33,3% (4/12) have discussed symptoms with their gynaecologist, 41,7% (5/12) with their general practitioner, 25,0% (3/12) with another healthcare provider.

Conclusion: More than a half of women in postmenopause had active sexual life, therefore urogenital symptoms play an important role in women's well-being. Most women in postmenopause experienced one or more menopausal symptoms caused by the urogenital system. The most common symptom was vaginal dryness caused by vulvovaginal atrophy. However, despite the symptoms of urogenital system and sexual health, most women do not turn to a healthcare provider.

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DERMATOSCOPY AND HISTOPATHOLOGY OF LICHEN PLANUS, NON-SPECIFIC AND ZOON'S BALANITIS

Introduction. Balanitis commonly runs a chronic course with non-specific symptoms including erythema, papules, burning sensation and sometimes erosions. In some cases, malignant transformation has been documented, therefore prompt diagnosis is essential. Dermatoscopy is a non-invasive optical tool that has been widely used in diagnosing inflammatory conditions of the skin and scalp. However, studies on utility of dermatoscopy in differentiating inflammatory balanitis are rare. The study aims to identify characteristic dermatoscopic features of common non-infectious balanitis.

Material and Methods. The study was approved by Rīga Stradiņš University Ethics Committee. Dermatoscopic images (magnification 20x) of histologically confirmed lichen planus (LP, N=5), non-specific (NS, N=5) and Zoon's balanitis (ZB, N=3) were analyzed by a board-certified dermatologist. Plasma cell infiltrate and dilated vertically oriented blood vessels in the papillary dermis were histopathological findings sought out to diagnose ZB, while chronic perivascular infiltrate and spongiosis were found in NB. Hypergranulosis, degeneration of basal keratinocytes, lichenoid lymphocytic infiltrate and pigment incontinence were histopathological features of LP. Sexually transmitted infections (STIs) were ruled out in all patients.

Results. Uniformly distributed linear branched vessels were observed in 4/5 NB cases. Wickham's striae (WS) (5/5) surrounded by dotted (3/5) and linear vessels (5/5) were characteristic dermatoscopic findings in LP. Erosion was observed in one LP case, while in case of ZB erosions were present in all cases (3/3). Other dermatoscopic findings in ZB included red and orange structureless areas and uniformly distributed curved and branched linear vessels.

Conclusions. Dermatoscopy could be a useful tool to differentiate common non-infectious balanitis.

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DIET RELATED HABITS AMONG RĪGA STRADIŅŠ UNIVERSITY AND OTHER LATVIAN UNIVERSITY STUDENTS

Key words: diet, students

Objectives. Food is an important part of every students daily life. It provides nutritional support to have energy for studies. Nowadays, when the market has been taken over by fast food, ready-meals and food delivery business – eating healthy is a problem. The aim of this research is to study students' eating habits in everyday life, during the exams and pandemic, and as well as to find out which products are preferred and what financial resources are directed to food.

Materials and methods. An anonymous survey was distributed among students. The results were collected and statistically analyzed using Microsoft Excel and IBM SPSS.

Results. Questionnaire was filled out by 450 students aged from 18–45y – 230 of respondents are Rīga Stradiņš University students. This study showed that there's a statistic significance in BMI between RSU (22.71) and other (23.37) university students (P=.025). Majority of the students follow a healthy diet (63.6%) and consume at least 1-2L (52%) or >2L (16.7%) of water daily (P=<.001). A total of 92.9% respondents prefer fresh food over semi-finished products (P=<.001). During pre-exam time, students' snack more (44.7%) and their coffee and energy drink intake increases (40.4%). Similar trends are seen

since the start of pandemic-snack times have increased (42.9%) and meals have become more irregular (39.1%). Products without which students cannot imagine their daily lives are: fresh vegetables (62%), meat (54%) and fruits (49.8%). Most of the students (61.3%) note that they spend <5€ per meal, 36.7% – 5 to 10€.

Conclusions. Despite the stress placed on students' shoulders, most try to maintain a healthy diet and prefer fresh homemade meals. There's a slight increase in snacking, coffee and energy drink intake during more tense periods. Majority of the students spend < 5€ per meal and can't imagine their lives without fresh vegetables.

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DIETARY FACTORS INFLUENCE ON TYPE I DIABETES PROGRESSION

Key words: *type 1 diabetes, diet score, diabetes complications*

Background. Type 1 diabetes is a chronic, progressive autoimmune disease that ultimately results in an absolute insulin deficiency. Prolonged inadequate control of hyperglycaemia, a common issue for Type 1 diabetes sufferers, leads to microvascular or macrovascular complications. This research has shown that medical nutrition therapy combined with physical activity and insulin therapy is part of the foundation for the treatment of type 1 diabetes.

Aim. To evaluate the correlation between dietary score changes and the progression of complications of type 1 diabetes comprising cardiovascular diseases, retinopathy and nephropathy. **Methods.** Patients were recruited for the LatDiane longitudinal study between October 2013 and July 2017. A total of 130 enrolled participants of the study came for a follow-up visit. The Diet Score was calculated using the data collected as part of the diet evaluation survey. IBM SPSS Statistics v.26 and MS Office Excel 2013 were adopted for data analysis. A level of $p < 0.05$ indicating significance was selected for all statistical tests used.

Results. The study included 130 patients with type 1 diabetes that consisted of sixty men (46%) and seventy women (54%). The average of Diet Score decreased by 0.14 of a point with the standard deviation (SD) of 2.90. In 60 subjects (46%) the Diet Score decreased, in 19 subjects it remained unchanged (15%) whereas in 51 subjects (39%) the Diet Score increased. Consumption of fresh vegetables by subjects decreased over time, but consumption of sweets increased over time in patients with type 1 diabetes. This reduced the Diet Score and worsened the quality of food the subjects consumed (p -values were 0.035 and 0.038 respectively, indicating significance of the results). As the study continued, patients who came for follow-up were divided into 2 groups: progressors and non-progressors. 36 patients were considered to be progressors. For progressors, the mean Diet Score was initially 9.97 points (SD of 2.96), while for non-progressors, the average was 8.52 points (SD of 3.20). The differences between the groups proved to be statistically significant with p value of 0.020. There was a small decrease in the Diet Score within the progressive group, namely by 0.86 of a point. However, nonprogressors had a small increase in their Diet Score – by 0.14 of a point (p -value of 0.078). Out of type 1 complications, only Cardiovascular Diseases (CVDs) progression, observed in 12 patients, showed a statistically significant difference between groups (p -value of 0.033). In patients with CVDs progression, the Diet Score decreased on average by 1.82 points, while those who did not have CVDs had an average increase of only 0.03 points to their Diet Score. Diabetic nephropathy and diabetic retinopathy were reported in 13 patients.

Conclusions. 36 of 130 participants progressed in at least one of the complications during the 3–6 year long study. CVDs was observed in 9% of the patients. The value of the type 1 diabetes Diet Score decreased on average. No correlation was found between the Diet Score and changes in the body mass index (BMI), hip, abdominal circumference and Hb1Ac. This research has demonstrated that Diet Score and its changes are associated with the development of complications in patients with type 1 diabetes. This decrease in Diet Score was proved to be positively correlated to CVDs progression.

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DOMINANT HAND TEMPERATURE CHANGES RELATED TO COMPUTER MOUSE PAD DESIGN AND BODY MASS INDEX DURING PROLONGED SEDENTARY WORK

Key words: mouse pad, ergonomics, BMI

Introduction. Prolonged sitting has been associated with the impairment of microvascular dilator function of the upper limbs with a decrease in blood flow. Ergonomic mousepad including wrist support could minimize the risk of occupational diseases as the number of sedentary workers has increased due to remote working.

The aim of this study was to find an association between body mass index (BMI) and changes in dominant hand wrist surface temperature while using 4 different types of computer mousepads.

Methods. 4 volunteers, sedentary occupation workers with their dominant right hand were selected for the study and their BMI was calculated. Each volunteer was asked to work with four different mousepad designs (Uppo, Wrist Donut, Duopad and Standard mouse pad) on different days for three continuous hours. The skin surface temperature of the right wrist was measured with high-resolution medical digital infrared camera ICI ETI 7320 Pro at the start and after every 15 minutes of the experiment.

Results. Wrist surface temperature decreased in all participants, regardless of BMI, however at different paces. A strong correlation with BMI and wrist temperature was found when using Wrist Donut mousepad ($r_s=0.701$, $p<0.01$), a moderate positive correlation with temperature was found while using Uppo mousepad ($r_s=0.484$, $p<0.01$) and standard mousepad ($r_s=0.499$, $p<0.01$), while strong negative correlation ($r_s=-0.808$, $p<0.01$) was found in a person with the lowest BMI (21.9). On opposite, no correlation was found between the average temperature of the right wrist surface and volunteer with the highest BMI (31.2).

Conclusions. Higher BMI is associated with higher wrist surface temperature when using computer mouse for prolonged periods. Low BMI is associated with faster and more prominent decrease in wrist surface temperature due to a thinner fat heat-isolating layer. Mousepad design is associated with changes in wrist surface temperature.

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DOSE OPTIMISATION FOR CT EXAMINATION OF PARANASAL SINUSES: A PHANTOM STUDY

Introduction: Since CT examinations are more commonly used worldwide, it is mandatory to evaluate the harmful effects of ionising radiation on one's health. Unfortunately in CT imaging more radiation means better image quality. Therefore a burning topic is iterative reconstruction techniques (IRT), which may compensate poor image quality determined by reduced ionising radiation dose.

Aim of the study: To find the most optimal IR technique allowing to perform paranasal sinus CT examinations with lower radiation doses.

Material and methods: Five CT image series of paranasal sinuses of a PIXY antropomorphic human phantom were scanned with a 64-slice Philips CT machine. Dose affecting parameters – kV and mAs – were changed every time. CT dose index (CTDI_{vol}, in mGy) for each scan differed (4,1–17,2 mGy). For every scan, 4 reconstructions were made using IRT Philips iDose, levels 1–4), for the bone windows. To

estimate the reconstruction quality, radiologist performed 15 measurements of radiodensity and image noise in 3 slices of every reconstructed series. The median density and noise values, as well as the corresponding signal-to-noise ratio (SNR) were calculated to estimate the most optimal IR technique providing the best image. Both image quality and CTDIvol used in examination were taken into account to determine the best IR technique for use in practice.

Results: From 20 reconstructions 300 radiodensity and noise measurements were made. With CTDIvol growing, noise levels decreased, until CTDIvol was above 12,8 mGy, noise levels started to increase. iDose 4 compared to iDose 3 in 3 out of 5 scans provided more noise. The lowest noise value (SD=38) as well as the best SNR (32,3) was acquired with iDose 3, when CTDIvol was 12,8 mGy.

Conclusions: In paranasal sinus CT examination, within comparable image quality levels, no IRT for bone window provides significantly less image noise than any other. Image quality is closely related to the dose used for examination.

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DROWNING ASSOCIATED RISK GROUPS IN A FIVE-YEAR TIME PERIOD IN RIGA AND RIGA PLANNING REGION: AGE AND SEASON

Key words: swimming, drowning, risk factors, Riga

Objective. Drowning is the 3rd leading cause of unintentional injury of death worldwide. These deaths are often unintentional, classified as accidents and instantaneous. However, they are potentially preventable. There are several factors that could be associated with risk groups within our population. Aim of this study is to identify whether age and season determines higher chance an individual will drown.

Methods. A study was carried out involving fatal drowning victim cases from January 1, 2015 to December 31, 2019 at the State Centre for Forensic Medical Examination of the Republic of Latvia. All recorded data were analysed using *MS Excel* and *IBM SPSS*.

Results. In total, 214 victim cases were included in this study. Mean age was 51 (SD=18.8). The 54,2% of drowning victims were in age group 35 to 64 (N=116), of which majority was in age group 45 to 54 (N=51), 24,3% were 65+ (N=52), 15,9% were 20 to 34 (N=34), 4,7% were 15 to 19 (N=10), 0,9% were 0 to 4 (N=2) years old. 45,3% of victims drowned in summer (N=97), 20,1% in autumn and in spring (N=43 in each), 14,5% in winter (N=31).

People who drowned in summer were mostly older than 45 (in total 63 cases). In spring, the drowning rate was the highest in age group 45 to 54 (N=16). In autumn, it was the highest in people older than 65 (N=14) which is at least twice as often comparing to other age groups in autumn. In winter, the drowning rate was similar in all age groups from 20 to 65+ approximately 6 people in each group. Children under the age of 4 drowned in summer and spring (one in each). Teenagers from 15 to 19 y.o. mostly drowned in swimming season during summer (N=9) but there were also incidents in autumn and spring (one in each).

Conclusion. People at the age of 45 to 54 and being in water in spring, as well as in summer and being older than 45 statistically determines that these individuals have higher risk to fall into category of drowning victims. People older than 65 y.o are also at risk in autumn.

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EFFECT OF HEALTHY LIFESTYLE FACTORS ON THE MANIFESTATION OF PERIMENOPAUSAL SYMPTOMS

Key words: *perimenopause, menopause, female, affecting factors, manifestation of symptoms*

For every woman, when she reaches a certain biological age, it is usually between 45 and 55 years of age, occurs menopause (Andreeva, 2006). Life after 50 becomes more relevant each year because in 2030 the number of such women in the world will reach 1.2 billion (Circene, 2018). Research objectives:

- Primary goal of the study: to determine the manifestation of the symptoms of perimenopausal symptoms and the factors affecting them;
- Secondary aim of the study: to analyze statistically significant factors affecting the symptoms of perimenopause.

Research question: What is the manifestation of perimenopausal symptoms and what factors do they affect?

Quantitative research method – survey was used for data acquisition. For a tool was selected the “Menopause Assessment Scale” (Lothar AJ Heinemann; MD, DSc (medicine), Msc (psychology), 2003) to which was added Questionnaire developed by the author. A sample of 100 women in the physiological perimenopausal period from 44 to 56 years with an average age of 49.

Results: The study data show that there are more respondents with increased body weight in the sample, with the most pronounced symptoms of menopause being obese women. The symptoms of menopause are most pronounced in women who drink very little water, who use dairy products only occasionally, who use fruit and vegetables only sometimes. 14% of the surveyed women do not sleep enough (less than 6 hours), 35% of respondents smoke.

Conclusions: The amount of drinking water consumed, the consumption of fruit and vegetables, the use of dairy products, the use of alcohol, smoking, sleeping and the use of hormonal therapy have a statistically significant effect on the severity of menopausal symptoms. Menopausal symptoms are most pronounced in women who do not sports exercises. The symptoms of menopause are least pronounced in women who prefer exercise in the gym.

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EFFECT OF STUDENT ACTIVITY ON PREFERRED WEEKLY EXERCISE INTENSITY, DURATION AND ANTHROPOMETRIC PARAMETERS

Key words: *physical activity, students, BMI*

Objectives: Intensive study time is connected with sedentary life style and increase mental workload and combination with unregular physical activity can cause health issues. The aim of the study was to evaluate effect of student activity on weekly exercise duration, preferred exercise intensity and anthropometric parameters.

Materials and methods: Anonymous digital survey was distributed among students from different higher education institutions. In the study participated 450 respondents. There was obtained data about anthropological parameters and weekly exercise duration and preferred exercise intensity.

Students were divided by their activity in physically active (A) and inactive (I) groups. All data are presented as quartiles and significant level $p < 0.05$.

Results: 88,44% (N=398) females and 11,56% (N=52) males participated in age group from 18–45.

There was significant difference between weekly exercise duration (A=3(3;4) vs. I=2(1;2); $p<0.001$), preferred exercise intensity (A=3(3;4) vs. I=2(2;3); $p<0.001$) and height (A=171(166;178) vs. I=169(165;173); $p=0.001$), however there was no significant difference between age (A=21(20;24) vs. I=22(20;23); $p=0.803$), mass (A=66(59;75) vs. I=64(58;75); $p=0.344$) and BMI (A=22.4(20.4;24.6) vs. I=22.4(20.1;25.5); $p=0.746$).

Comparing results between genders there was significant difference between mass (F=64.0(57.0;72.3) vs. M=75.0(69.0;85.8); $p<0.001$), height (F=169(165;174) vs. M=182(180;186); $p<0.001$) and preferred exercise intensity (F=3(2;3) vs. M=3(3;4); $p=0.014$), but no significant differences between BMI (F=22.4(20.2;24.6) vs. M=22.8(20.8;25.0); $p=0.250$) and weekly exercise duration (F=3(2;4) vs. M=3(2;4); $p=0.602$) and age (F=21.5(20.0;23.3) vs. M=21.0(20.0;23.0); $p=0.167$).

Conclusions: Male students weekly exercise duration, height and mass was significant higher than in female students, however the preferred exercise intensity was higher in physically active student group. There was no significant difference in body mass index between genders and physical activity groups.

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EFFECTIVENESS OF THE LIPID-LOWERING THERAPY IN ACHIEVEMENT THE TARGET LEVELS OF LOW-DENSITY LIPOPROTEIN CHOLESTEROL IN DIFFERENT CARDIOVASCULAR RISK PATIENTS IN ONE FAMILY PHYSICIAN'S PRACTICE

Introduction. Cardiovascular diseases (CVD) are the leading cause of death worldwide. Low-density lipoprotein cholesterol (LDL-C) is a major causal factor in CVD. LDL-C levels directly correlate with the risk of cardiovascular (CV) events. It is important to optimize lipid-lowering therapy (LLT) to reach a target LDL-C level for each CV risk group.

Aim. To evaluate the results of LLT using LDL-C target levels according to European dyslipidemia guidelines.

Materials and methods. Patients receiving LLT for at least 2 months with LDL-C measurement on stable LLT dose were included. The statistical analysis was done using IBM SPSS applying the Chi-square and T-tests to determine if factors such as gender, age, smoking, diabetes, BMI, CV risk category, LLT dose or combined LLT, were associated with achieving the LDL-C target level.

Results. The study involved 104 participants – 39% women, 61% men. The mean age was 67.7 ± 8.1 years. According to the LDL-C target levels defined in the ESC/EAS 2019 and 2016 guidelines, 60.6% and 97.1% of participants attained these targets, respectively. The highest compliance with the target levels defined by ESC/EAS 2019 guidelines was 100% for the low risk group, followed the moderate risk group (88.9%), the high risk group (57.1%), very high risk group (52.4%). Compared to the target levels of ESC/EAS 2016 guidelines – 100% achievement in the low and high risk group, 96.8% in the very high risk group and 94.4% in the moderate risk group. Smoking ($p = 0.04$) and very high CV risk group ($p = 0.02$) are associated with non-attainment of LDL-C target levels.

Conclusion. The total number of patients who achieved LDL-C target levels dropped after applying the new target levels defined by the 2019 ESC/EAS guidelines in comparison to the ESC/EAS 2016 guidelines. The lowest LDL-C target achievement rate was in the very high CV risk category. LLT should be optimized in all groups with particular emphasis on patients at very high CV risk and smokers.

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EMPLOYMENT OF GRADUATES OF DAUGAVPILS UNIVERSITY PROFESSIONAL BACHELOR STUDY PROGRAMME “PHYSIOTHERAPY”

Key words: graduates, employment, physiotherapy

Background: In the framework of DU PBSP “Physiotherapy”, regular and continuous contact with employers and graduates of the programme is maintained, but to strengthen and speed up the mutual communication, exchange of ideas, as well as gain feedback, and to promote the development of DU PBSP “Physiotherapy”, a closed Facebook group “DU Physiotherapists” was created.

Materials and methods: In the closed group “DU Physiotherapists”, on January 22, 2021, at 16:56 a survey was published on the portal “*visidati.lv*”. The survey was designed to find out the employment of the graduates of DU PBSP “Physiotherapy”. The portal “*visidati.lv*” is a site that provides its registered users with the opportunity to collect information and perform its processing in compliance with LR legislation.

Results: In the period 2003 – 2020, 319 students graduated from PBSP “Physiotherapy”. In the closed group “DU Physiotherapists”, on March 1, 2021, at 10:00 there were 221 members registered, four of whom are not the graduates of DU PBSP “Physiotherapy”, therefore they are not included in the analysis of the results. In the Facebook group, there are 68% of graduates who have graduated from PBSP “Physiotherapy” in the period 2003 – 2020. The last answer to the survey portal “*visidati.lv*” was registered on February 25 at 10:09. In total, 145 questionnaires were analysed. The questionnaire was filled in by 67.3% of the members of the said Facebook group, which makes up 45.5% of all the graduates of PBSP “Physiotherapists”. The number of respondents was 145 (12 men and 133 women), ages 23 to 52. It was found out that 134 or 92.4% of the respondents work as physiotherapists or in a field related to the study programme “Physiotherapy” and 11 or 7.6% are not employed in the health care sector. The respondents work in hospitals, polyclinics, health centres, medical centres, rehabilitation centres, health promotion centre, social rehabilitation centres, state social care centres, social services centre, Social Integration State Agency, pre-school educational institutions, special pre-school educational institution, primary school, individual companies and private practices in various cities and districts of Latvia, as well as outside the territory of Latvia – one respondent works in the acquired profession in Denmark and one – in Germany.

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ENDOMETRIAL CARCINOMA – MR EFFICIENCY IN PREOPERATIVE UTERAL STRUCTURE INVASION STAGING AND ONKOLOGIC PROCESS SPREAD DETECTION IN SMALL PELVIS

Key words: magnetic resonance imaging (MR), endometrial carcinoma (EC), cancer staging

Background. The incidence of EC has risen over the last decade and it is the fourth commonest female cancer in the Europe. Several authors mention western lifestyle and increased longevity in developing countries as probable causes of increasing EC incidence. Ultrasonography, computed tomography and magnetic resonance imaging (MR) have been used for preoperative workup, with MR showing the greatest efficacy.

Aim. To determine the diagnostic sensitivity, specificity, accuracy, positive and negative predictive values (PPV and NPV) of MR in detecting myometrial invasion, cervical and parametrial involvement and overall invasion stage in endometrial cancer.

Methods. A retrospective study was conducted in Riga East University Hospital. Study included 199 consecutive endometrial carcinoma patient data, who underwent preoperative MR between 2017 and 2020. The FIGO staging system was used to classify myometrial invasion as $\leq 50\%$ or $\geq 50\%$, cervical and parametrial invasion as positive or negative. The preoperative MR findings were compared with final histological staging; the latter was taken as the gold standard. Obtained data was statistically analysed in Microsoft Excel and IBM SPSS software, 26.0 version.

Results. In period of 28 days between MR and histology the sensitivity, specificity, accuracy, positive and negative predictive values of MR for the detection of myometrial invasion $< 50\%$ were 58,8, 85,0, 69,3, 85,4 and 58,1%; for the detection of cervical invasion were 50,0, 98,7, 92,4, 73,3 and 94,0%; for the detection of parametrial invasion were 41,7, 95,2, 91,9, 35,7 and 96,2%, respectively. In case of reducing period between MR and histology to 14 days histology the sensitivity, specificity, accuracy, positive and negative predictive values of MR for the detection of myometrial invasion $< 50\%$ were 50,6, 87,8, 64,6, 87,2 and 51,8%; for the detection of cervical invasion were 44,4, 98,2, 90,8, 80,0 and 91,7%; for the detection of parametrial invasion were 28,6, 94,3, 90,8, 22,2 and 95,9%, respectively. Overall MRI predicted the degree of invasion in period of 28 days between MR and histology with 54,8% accuracy; changing period to 14 days MR accuracy rate dropped to 49%.

Conclusions. MR is a valuable imaging modality in the preoperative assessment of cases of endometrial cancer. MR assists in planning the surgical treatment of endometrial cancer with good accuracy and specificity, although sensitivity is suboptimal. Adherence to standardised high-quality protocols may help to improve future results.

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ENDOVASCULAR TREATMENT OF VERTEBROBASILAR STROKE - CLINICAL RESULTS

Key words: *vertebrobasillar stroke, mechanical thrombectomy, cerebral stroke*

Vertebrobasillar stroke is rare disease, with only 15–20% cases from all ischemic strokes, but mortality with conservative treatment can reach even 80–95%.

This trial objective is to analyze patient data with vertebrobasillar stroke, which were treated with endovascular thrombectomy, focusing on effectiveness, safety and clinical outcomes, comparing last with control group where patients received only conservative treatment, due to different contraindications.

The study analyzes patients with acute cerebral infarction in the vertebrobasillar pool during the time period from January 1, 2015 to December 31, 2018. The TICI scale is used to evaluate vascular recanalization. The modified Rankin scale (mRS) is used for functional assessment of patients. The patient's neurological condition is assessed by the NIHSS scale. Patients are assessed at the time of hospitalization, after prescription and after 90 days.

The study included 56 patients, 44 - active group (treated with thrombectomy or thrombectomy in combination with intravenous thrombolysis) and 12 patients - control group. Analyzing the mRS index 90 days after prescribing, in the active treatment group, the mRS score from 0 to 2 had 56% of patients and in the control group 8%. Poor clinical outcome (mRS 3 to 5) had 22% of patients in the active group and 42% in the control group. Mortality in the active reperfusion group was 22%, in the control group 50%. The difference between two groups was statistically significant ($p = 0.009$). Recanalization was effective in 93.2% of patients. The median NIHSS for patients after prescription in the active treatment group was 4, in the control group 13 ($p = 0.022$).

Thrombectomy is a safe and effective treatment for vertebrobasillar stroke, which provides the better neurological and functional outcome compared to the control group.

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EVALUATION OF MEDICAL FACE MASK ERGONOMICS IN DIFFERENT WORKING CONDITIONS: A PILOT STUDY

Introduction. During the COVID-19 pandemic, medical masks have become a daily requirement. Wearing a face mask for long hours, it is important to keep in mind the ergonomics and the long-term effects it leaves on facial skin and working ability.

The study aimed to evaluate the face mask ergonomic parameters and subjective comfort during mental and physical work.

Materials and methods. Facial skin surface temperature was measured by an infrared camera in 8 participants before and after wearing a medical mask for 20 minutes of mental work compared to 10 participants who performed physical activity tasks in a protective gown and a medical mask for 17 minutes. Additionally, a survey about the subjective comfort while wearing the face mask was conducted. Data statistical analysis was performed by the IBM SPSS Statistics 26 program.

Results. The average temperature of the facial skin in mental workers increased by 0.58 °C (from 28.04 °C ± 0.79 °C till 28.62 °C ± 0.68 °C). While in physical workers who performed tasks in the protective gown and medical mask increased by 0.21°C (from 28.72±0.80°C till 28.93±0.51°C). Physical workers (60%) were more dissatisfied with the mask model than mental workers (38%), and physical workers (70%) complained more about breathing difficulties than mental workers (62%).

Conclusions. Mental workers got a higher face skin temperature increase than physical workers, that can be partly explained by intensive sweating during physical activity. Nevertheless, physical workers subjectively experienced greater sweating and discomfort in different facial areas. Knowing about such problems in the short term, it is essentially to focus on participants' suggestions to improve the flexibility, softness, and air permeability of the mask material.

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EVALUATION OF THE USE OF SCREENING AND THE BENEFITS OF IMPLEMENTING THE NEW COLORECTAL CANCER SCREENING PROGRAM IN LATVIA

Key words: Faecal occult blood test, iFOBT, gFOBT, colorectal cancer screening

Objectives. Every year over 1,3 million cases of colorectal cancer are diagnosed. Five-year survival rate is 90% for stage 1 and 5–10% for stage 4. By the end of 2019 the new colorectal cancer screening program (iFOBT), which is based on immunohistochemical method, has been implemented, and it requires only one faecal sample unlike previous screening test (gFOBT).

Aim. To compare the attitude of Latvian general practice patients towards two colorectal cancer screening tests, as well as the use of the screening.

Methods. Descriptive cross-sectional study using questionnaire about new iFOBT and previous gFOBT advantages, disadvantages and patient use of both tests was carried out online. The questionnaire included Latvian general practice patients aged 50–74.

Results. 102 participants were included into the study, 48% (n=49) of respondents have taken iFOBT in 2020. Patients who visited their family practitioner more often than once per 6 months 61,8% (n=20) underwent the screening statistically more than those patients who visited their doctor less often 38,2% (n=19), (p<0,05).

The iFOBT explanation by family doctor was appropriate to 95,5% (n=47), the instruction was clear to 87,8% (n=43). iFOBT did not cause any inconveniences to 59,2% (n=29), but 30,8% (n=4) of those having no complains about iFOBT pointed out that they had felt unpleasant smell in gFOBT. gFOBT instruction was not clear to 42,9% (n=6) of patients for whom iFOBT instruction was clear. gFOBT test kit was not appropriate for 35,7% (n=5) for whom iFOBT kit was.

In 2020 iFOBT was not offered to 43,4% (n=23) of respondents, 22,6% (n=12) could not undergo it due to COVID-19. In previous 5 years only 21,54% (n=22) of respondents have taken gFOBT at least once.

Conclusions. Patient use of colorectal cancer screening is low, and COVID-19 has complicated implementation of iFOBT. iFOBT had lower complain rate and less confusing instructions compared to gFOBT.

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EVALUATION OF VITAMIN D IN BRONCHIAL ASTHMA AND ASTHMA CONTROL IN CHILDREN

Background. Asthma is the most prevalent chronic disease in pediatric population, it affects many aspects of children's lives. Vitamin D has immunomodulatory properties, but it is not clear yet whether it has any effect on asthma control. The results of the studies are contradictory, it is hypothesized that vitamin D (25(OH)D) deficiency (<30ng/ml) is associated with a poorer asthma control in children than with optimal serum vitamin D level. (Kaaviyaa *et al.*, 2018). It is important that we apprise these values to provide the best possible asthma control for children.

Aim. The objective of this study was to analyse asthma control level and serum vitamin D level (25(OH)D) in children ages 4–18.

The study was carried out to check the potential relationship between asthma control level, frequency of asthma exacerbations and serum vitamin D.

Methods. In this study, children with asthma aged 4–18 years were surveyed in social networking platforms (*Facebook, Twitter etc.*). The participants voluntarily completed questionnaire that included several asthma related dimensions encompassing asthma control level, severity, treatment, vitamin D level, frequency of exacerbations and quality of life which included 3 domains – symptoms, emotional function, and activity limitations.

Test used to assess quality of life – miniPAQLQ (*mini Pediatric asthma quality of life questionnaire**). Statistical analysis was performed with SPSS statistics. To determine the statistical correlation Spearman correlation test was used. Level of statistical significance was set at $p < 0,05$.

Results. Overall, 46 participants, were surveyed all of them (100%) had asthma. The mean children age was $10,1 \pm 3,4$ (4–18) years. 71,7% (n=33) had well controlled asthma, 43,5% (n=20) had intermittent asthma. 63% (n=29) uses vitamin D level. Serum vitamin D levels (25(OH)D) of analysed patients ranged from 16,5 ng/mL to 45 ng/mL. 63,0% (n=17) were diagnosed with vitamin D deficiency (25(OH)D) below 30 ng/mL). 69,6% (n=32) have had and asthma exacerbation in the past year. In 21,2% (n=7) cases exacerbation frequency has decreased on vitamin D supplementation therapy. Children were divided in 2 groups based on asthma control level – well controlled and poorly controlled asthma. There is no statistically significant difference in serum vitamin D level between 2 groups ($p = 0,275$). There is no statistically significant correlation between blood vitamin D levels and the number of outbreaks in the last year ($R = -0,02$, $p = 0,921$)

Conclusions. Vitamin D deficiency is observed in most of the asthma patients. Serum vitamin D levels has no effect on the level of asthma control and frequency of asthma exacerbations. For better understanding how vitamin D affects asthma control and symptoms we need to continue study increasing the sample size of patients.

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EXTRAIESTINAL MANIFESTATIONS OF INFLAMMATORY BOWEL DISEASE: A CASE REPORT

Introduction. Inflammatory bowel disease (IBD) is a chronic inflammation of gastrointestinal tract uncertain aetiology. There has been a global rise in the incidence of IBD over the last few decades. Many factors such as genetics, dietary factors, for example, increased intake of animal fat, smoking, medications, previous gastroenteritis and other play a significant role in its development. One of the IBD is ulcerative colitis, which causes a recurring inflammation of mucosa in the colon and rectum. Typical symptoms are bloody stool, abdominal pain, cramps. The course of disease varies from mild to severe. Approximately half of patients experience at least one extra-intestinal manifestation. Some of them can cause a life threatening condition. Therapy's approaches vary from severity, previous response to therapy and presence of complications.

Case report. A 36-year-old man with ulcerative colitis was admitted to the hospital with 3-week history of chest pain, shortness of breath, red nodules on the left foot and necrotizing ulcer on the right ankle and fever. Patient claimed that flair of ulcerative colitis began earlier with bloody stool 10 times per day. At admission ECG showed ST elevations in apical wall, elevated highly sensitive Troponin, elevated pro-BNP, also 13 mm pericardial effusion in CT scan. Patient underwent coronarography, which was normal. Pyoderma gangrenosum of the right ankle and erythema nodosum of the left foot extended, inflammatory markers continuously elevated despite empiric broad spectrum antibiotics and basic systemic and local therapy of ulcerative colitis. After exclusion of infections (blood, urine and culture swab from ulcer - were negative) a pulse therapy with methylprednisolone was assigned, antibacterial therapy was switched to piperacillin/tazobactam. Due to the treatment patient's condition improved; ulcer began to heal. He was discharged from the hospital in one month time.

Conclusion. The early recognition and appropriate management of extraintestinal manifestations of inflammatory diseases reduces complications, irreversible consequences and reduce hospitalization time.

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FACTORS INFLUENCING THE PATIENTS' KNOWLEDGE REGARDING THE CARDIOVASCULAR DISEASE PREVENTION PROGRAM

Key words: cardiovascular diseases, prevention, General Practitioners

Objectives. Cardiovascular diseases (CVD) are the leading cause of death in the world, also in Latvia. In Latvia in 2019, CVD was the cause of death in 54%. CVD develops gradually over several years. Such factors as sedentary lifestyle, unhealthy diet and smoking play significant role in the development of CVDs. Therefore, general practitioners (GP) have an important role in CVD prevention by observing and educating patients.

The aim of this study was to find out what influences the patients' knowledge about CVD prevention programme.

Methods. It was cross-sectional study were patients from different GP practices were included. In all patients anthropometric data, blood pressure, heart rate was assessed and patients completed a questionnaire about their habits and knowledge about CVD prevention and RF. Patients were divided into two groups, whether they know about CVD prevention program (CVDP+ group) or no (CVDP - group).

Results. There were 103 patients (65 women, 38 men) aged 40 to 65. Study included 63 (40 women) in CVDP+ group and 40 (25 women) in CVDP-group. 61% from all respondents knew about CVD prevention.

In CVDP+ group there were higher number of patients who know about CVD RF (56 from 63) comparing to CVDP-group (10 from 40) what was statistically significant ($p < 0,001$).

Pre-existing chronic conditions, daily medication use, being informed about own cholesterol, sugar and blood pressure levels, existing CVD RF in patients – age, smoking habit, arterial hypertension, diabetes – did not affect the knowledge about CVD prevention program ($p > 0,05$).

Conclusions. Many patients do not know about CVD prevention program. The presence of RFs in patients does not show better knowledge about CVD prevention program.

Active involvement of GPs in patient education and invitation to CVD prevention program is a key factor influencing to educate about CVD.

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FREQUENCY OF BURNOUT SYNDROME AMONG RSU STUDENTS, WORKING IN MEDICAL FIELD

Key words: burnout, burnout syndrome, students

Objectives. Burnout syndrome is syndrome, that occurs from chronic stress at the workplace when stress is not being properly overcome. It is being characterized by three factors: lack of energy, negative cynic attitude towards job and reduced professional productivity. Burnout syndrome among medical employees is connected to poorer health care quality, dissatisfaction of clients, increase of expenses, and can lead to physical and psychological disorders. There is no data about burnout syndrome frequency among students working in medical field in Latvia.

The aim was to evaluate burnout syndrome frequency among RSU students working in medical field.

Methods. A total of 58 RSU Medical faculty students, that currently work in medical field have participated in this research. Form included questions about age, gender, study year, position, workload, workplace and 22 questions from Maslach's burnout questionnaire, that are divided in 3 subscales – emotional depletion, depersonalisation and personal achievements. There are 7 answer options for each question – never, few times a year, once a month, few times a month, once a month, few times a week, each day.

Results. 58 respondents have participated in research. Among them 36 (62%) are women and 22 (38%) – men. Respondent's average age is $M = 24,0$ years with standard deviation $SD = 2,1$ year. Average emotional depletion subscale value of Maslach's burnout questionnaire is $21,78 \pm 12,66$. Average subscale value of personal achievements is $30,64 \pm 7,38$. Average value of depersonalization is $10,22 \pm 7,86$. Emotional exhaustion subscale show that 50,0% of the respondents and depersonalisation subscale – 56,9% respondents have higher scores than mean, in personal accomplishment subscale – 53,4% respondents have lower scores than mean.

Conclusions. In half of the respondents are observed signs of burnout syndrome. Small sample size may influence result, it is necessary to continue the research.

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HAND HYGIENE AND MASK WEARING HABITS OF ADOLESCENTS DURING THE COVID-19 PANDEMIC IN LATVIA

Background and objectives: With the COVID-19 pandemic it is more important than ever to have proper hand hygiene and correct mask use, especially among socially active adolescents. Looking into their habits of use of these safety measures will let us analyze the situation and propose ways to improve it.

Materials and methods: data was gathered using a survey that was distributed to Latvian schools (grades 8–12) in November–December of 2020. IBM SPSS Statistics 26 (descriptive statistics, chi-square test) was used to analyze the surveys (total N=161).

Results: Participants pay more attention to hand washing (61.5%; N=99) and hand disinfection (77.6%; N=125) now than they did before the COVID-19 pandemic.

All participants have seen the “6-step hand washing technique”, but only a fifth part (21.7%; N=35) follow all the steps. The majority (68.3%; N=110) only follow some.

37.3% and 40.3% of participants wash their hands 4–6 and 7–10 times a day respectively. However, 16.1% (N=26) do not use hand disinfection at all. Older respondents wash their hands more often. It was also found that female attitude toward hand washing and disinfection is more positive than male. 34.8% of adolescents (N=56) change masks once a week, 14.9% (N=24) – when the mask is not usable anymore. Only 9.3% of all children change or wash their masks before every use.

When wearing masks, participants cover both mouth and nose at almost all times: in public transport (95%; N=153), in shops (94.4%; N=152), in restaurants (80.7%; N=130), during public events (84.5%; N=136).

Conclusions: Despite being informed of proper hand washing technique, most do not use it fully. Overall, most participants wash their hands in decent amounts every day. A considerable number of participants do not use hand disinfection at all. As anticipated, older adolescents use hand hygiene more often than younger children. Habits of mask wearing are proper in the majority of participants, but the frequency of mask changing is concerning.

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HOSTILITY RELATION TO DEPRESSION AND ANXIETY AMONG STUDENTS WHO PLAY INTELLECTUAL GAMES

Key words: students, games, anxiety, hostility, depression

Objectives. Depression and anxiety are common mental illnesses. There are studies providing data that people with depression are likely to have increased level of hostility, that aggression is related to depression. Some studies show a relation between mental capacity and aggressive behavior.

The aim is to find out hostility relation to depression and anxiety symptoms and associated risk factors among Rīga Stradiņš University (RSU) healthcare programs students who play intellectual games.

Materials and methods. A quantitative cross-sectional study was taken in the population of RSU students. Study group – students who play some intellectual games, control group – those who don't. The online survey included questions about participants' age, sex, studying at RSU in a healthcare program, playing intellectual games, depression risk factors, PHQ-9 depression scale, GAD-7 anxiety scale, Buss-Durkee hostility inventory (BDHI). Data was analyzed using IBM SPSS Statistics v26.

Results. In the study participated 139 students, 117 (84.2%) females. The groups compared: study group (n=75) and control group (n=64). There was found no statistically significant difference in BDHI scales ($p>0.15$ in each one), PHQ-9 ($p=0.131$) and GAD-7 ($p=0.288$) between the groups. There was a significant correlation found between number of types of violence (physical, emotional, sexual) person experienced and PHQ-9 score ($r=0.347$, $p<0.001$) and GAD-7 score ($r=0.318$, $p<0.001$). There was no statistically significant relation found between other depression risk factors and PHQ-9 and GAD-7 scores.

In study group experience of income loss is associated with increased levels of: indirect aggression ($p<0.05$), irritation ($p=0.014$), resentment ($p=0.031$), verbal aggression ($p=0.004$) and aggression index ($p=0.005$) while control group showed no statistically significant differences. In control group those who reported the experience of any type of aggression, are more likely to have increased levels of aggression index ($p=0.043$) while study group shows no statistically significant differences.

Conclusions. There is no significant difference in depression and anxiety symptoms and hostility among the group, studying healthcare is likely to be a mental training per se that neutralizes possible differences. However, playing intellectual games is associated with decreased levels of aggression among those who reported any type of violence.

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IMPACT OF BALANCE, GAIT AND COORDINATION TRAINING IN THE COMPLEX CARDIOREHABILITATION PROGRAM FOR GERIATRIC PATIENTS AFTER CARDIAC SURGERY (VALVE REPLACEMENT)

Key words: *geriatrics, cardiorehabilitation*

After valvular cardiosurgery (with extracorporeal circulation), most geriatric patients develop (latent) cerebro-vascular insufficiency in the vertebro-basilar system with balance problems or ataxia signs.

Our GOAL was to evaluate the possible impact of balance, gait and coordination training in the complex cardiorehabilitation (CR) algorithm of old patients after cardiac surgery.

Material and Methods.

We observed 369 patients after cardiac surgery (7-10 days after valve replacement – aortic, mitral or tricuspid). Patients were randomized into three therapeutic groups. The control was done before, during and at the end of the CR course (of 10 treatment days), and one month after its end – using a battery of clinical methods and functional scales.

In all patients, we applied a complex **cardio-rehabilitation (CR) programme** of *physiotherapy and ergotherapy*; including cardio-training, respiratory exercises (predominantly for external and internal intercostal muscles); and goal-oriented activities (standing up, walking and climbing stairs). Group (gr) 1 received only this CR programme. In gr 2 we added *balance and gait training exercises*. In the next group (gr 3) we applied additionally *coordination exercises* for the upper and lower extremities.

The statistical ANALYSIS OF THE RESULTS of functional assessments demonstrates in all patients significant improvement of circulatory parameters (response of arterial tension and pulse to physical activity); upgrade in cardiac functional parameters (Holter-cardiography; Trans-Thoracic Echocardiography /ejection fraction/), enlargement in autonomy (Timed Up and Go test; Functional Independence Measure – subscales of Self-care, Transfers and Locomotion). We observed bigger amelioration in quality of life in the third group.

Conclusion. Balance and coordination training must be included in the CR-cardiorehabilitation algorithm in geriatric patients after cardiosurgery requiring extra-corporeal circulation.

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IMPACT OF DIFFERENT SKIN DISINFECTANTS ON THE SKIN HYDRATION LEVEL

Key words: skin hydration, skin disinfectants, dermatology

Objectives: Hand-hygiene and skin disinfection has become one of the main measures to slow down the spread of the COVID-19. However ethanol-based skin disinfectants may weaken the skin barrier function inducing skin dryness, promoting eczema and therefore decrease the compliance. Skin damage due to intensive hand hygiene measures during the COVID-19 pandemic has been reported.[1] The objective of this study was to evaluate impact of different skin disinfectant formulas in the form of sprays and gels on the skin hydration level.

Materials and methods: Volunteers (N = 16) applied 4 different skin disinfectants on certain areas of the forearm 5 times over the 24 hour period: spray A (with glycerine), spray B (without glycerine), gel A (with hyaluronic acid), gel B (without hyaluronic acid). Upper arm was untreated and used as a site for control measurements. Instrumental assessment to evaluate skin hydration level was performed using Corneometer® on the forearm and upper arm area before, 1 hour and 24 hours after the first application. Between-group differences were assessed by independent T-test. P value < 0,05 was considered statistically significant.

Results: Statistically significant increase in skin hydration level 24 hours after first application was observed in the area with spray A application (12,36%, SD = 18,08) compared to the area with spray B application (-3,14%, SD = 22,24), p = 0,039. Statistically significant increase in skin hydration level 1 hour after first application was observed in the area with spray A (22,91%, SD = 31,65) application compared to the control area (3,79%, SD = 16,41), p = 0,043.

Conclusions: Spray A (with glycerine) application improves skin hydration level immediately after 1 hour compared to the untreated area and after 24 hours compared to the spray B (without glycerine) therefore use of it could enhance compliance with skin disinfection and reduce skin damage.

[1] Erdem, Y, Altunay, IK, Aksu Çerman, A, et al. The risk of hand eczema in healthcare workers during the COVID-19 pandemic: Do we need specific attention or prevention strategies? *Contact Dermatitis*. 2020; 83: 422- 423.

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IMPACT OF METABOLIC SYNDROME ON LEFT VENTRICULAR ECHOCARDIOGRAPHIC VALUES IN PATIENTS WITH ATRIAL FIBRILLATION

Key words: atrial fibrillation, metabolic syndrome, transthoracic echocardiography

Objectives. Atrial fibrillation (AF) is a supraventricular tachyarrhythmia characterized by irregular atrial contraction. Transthoracic echocardiography is needed to evaluate cardiac chamber sizes and function. Metabolic syndrome (MS) is a cluster of metabolic abnormalities associated with an increased risk of cardiovascular disease and type 2 diabetes mellitus.

The aim of this study was to compare echocardiographic values of the left ventricle – posterior wall thickness (PWd), interventricular septum thickness (IVSd), end diastolic diameter (EDD), end systolic diameter (ESD) and ejection fraction (EF) – in AF patients with and without MS.

Materials and Methods. A study was performed in a tertiary university hospital, including 90 AF patients. Data was collected from hospital's medical records. The participants were divided into 2 groups based on the metabolic syndrome criteria count. Echocardiographic values were compared between the groups with and without MS. Statistical analysis was performed using IBM SPSS.

Results. The median age of the participants was 69 years (IQR:60-77), 58.9% (n=53) were males. 48.9% (n=44) of the participants had metabolic syndrome.

A statistically significant difference ($p=0.02$) was found when comparing IVSd median values among the groups of AF patients with and without MS, respectively, 12 mm (IQR:10-13) vs 10 mm (IQR:9.825-12).

No statistically significant difference was found when analyzing other left ventricular echocardiographic values among the groups, respectively, $p > 0.05$ when comparing EF, PWd, EDD and ESD.

Conclusions. In this study metabolic syndrome appears to be an independent predictor for elevated interventricular septum thickness values.

Overall, the main limitation of this study is the relatively small sample size.

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IMPACT OF ROBOTIC REHABILITATION WITH LOCOMAT (HOCOMA SYSTEM) ON BALANCE AND GAIT STABILITY IN POST-TRAUMATIC PARAPLEGIA (A CASE REPORT)

Key words: paraplegia, robotic rehabilitation

During last years, we observe an increasing frequency of traffic accidents and the resulting neurological complaints. Clinical features depend on the level of the spinal trauma. The most frequent levels of spinal injuries are cervical and thoracal, In case of thoracal vertebral fracture the most common neurological consequence is the spastic paraplegia.

We present a male patient of 21 years, transferred to our PRM Department one month after neurosurgery (thoracic stabilization) for an important vertebral thoracic fracture.

During clinical exam (at the admission), we observed a complete inferior paraplegia with total dependence in activities of daily living (ADL): impossible autonomic movements in the bed, the patient was only in lying position. X-Ray, CT scan and Magnetic Resonance Imagery (MRI) of the spine after the traffic accident demonstrated fracture with dislocation of thoracic vertebrae and ribs. An urgent neurosurgical thoracic stabilization was realized. The patient had urinary catheter and severe urinary infection, treated with antibiotics.

We applied a complex rehabilitation, including preformed physical modalities (electrical stimulations), gradual verticalization, individualized physiotherapeutic and occupational therapeutic program, accentuating on balance and gait training, ADL education. Six months after the traumatic spinal cord injury (SCI), we began with robotic rehabilitation with Locomat system (Hocoma).

We noticed significant efficacy of the rehabilitation: improvement of the range of motion of the cervical spine, pain relief, balance stabilization, amelioration of autonomy in activities of daily life. At the month nine after the SCI the patient have the capacity of autonomic verticalization with a walker and gait – without assistance.

We consider that every patient with post-traumatic inferior paraplegia must be included in a longterm physiotherapeutic and ergotherapeutic program, if possible – with robotic rehabilitation.

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IMPACT ON THE SCORE CHART PREDICTIVE ABILITY BY USING LOW-DENSITY CHOLESTEROL LEVEL AS ONE OF ITS VARIABLES

Introduction. The accuracy of methods for identifying persons at high cardiovascular risk is of primary importance in the prevention of fatal cardiovascular diseases (CVD).

Objectives. To estimate whether using of low-density cholesterol (LDL) level as a variable instead of total cholesterol level increases predictive ability of the Systematic COronary Risk Evaluation (SCORE) chart.

Materials and Methods. This retrospective study was conducted at the family doctor's practice in Riga examining 460 patient's records corresponding to the SCORE chart criteria. The level of LDL was taken as equal to the level of total cholesterol if the difference between them was two units. Differences in the predicted risk levels occurred when the level value differed by more than 2 units from each other. Data processing and analysis was performed using the Microsoft Excel, SPSS and the Spearman correlation coefficient.

Results. The correlation (r_s) between the calculated risk level and actual fatal CVD in the next decade in the alternative version of the SCORE chart (using LDL level) occurred slightly stronger than in its traditional version (using total cholesterol level), respectively, 0.13 ($p < 0.01$) and 0.15 ($p < 0.01$). Among CVD patients, the traditional SCORE chart identified increased cardiovascular risk ($> 5\%$) in 41%, however the alternative chart recognized by 2% more, namely 43%.

Conclusions. Replacing one of the variables – total cholesterol with LDL – slightly increases the SCORE chart predictive ability. Unfortunately, in both versions, the correlation between the calculated cardiovascular risk level and the real CVD events in the next ten years appeared to be weak, and more than 50% of patients with fatal CVD in the future remain unidentified as a high-risk patients. However, even small improvements in the accuracy of this predictive method deserve attention and possible revision of the SCORE chart.

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INJURY CAUSES AND SEVERITY IN POLYTRAUMA PATIENTS ADMITTED TO THE RIGA EAST UNIVERSITY HOSPITAL “GAILEZERS” IN 2020 COMPARED TO 2019

Objectives: The aim of the research was to compare the demographics and injury mechanisms in polytrauma patients admitted to biggest polytrauma unit in Latvia – Riga East University Hospital “Gailezers”, and compare all the data with 2019 results.

Methods: statistical analysis of data was performed using IBM SPSS. Data were collected from January, 2020 to December, 2020. In total, 352 patients were admitted to the polytrauma ward. Injury mechanisms were divided into 12 categories – traffic accidents, which were further divided into six subgroups (pedestrian, driver, passenger, motocyclist, cyclist and unknown traffic member), fall from the height and stairs, hit by train, beaten, injurious fall severity, explosion and unknown circumstances. All data were compare with 2019 research about polytrauma.

Results: In 2020, 352 patients were assessed according to polytrauma protocol and admitted to the polytrauma ward, compared to 2019 when 469 patients were admitted. In 2020, the average age was

45,04 years – 48, 87 years for women and 43,62 for men, but in 2019, the average age was 44.5 years. Almost zero difference in gender – dominance of male patients, 73, 01% vs 26, 99% and in 2019 73.9% vs 26.1%. Most frequent trauma mechanism was falling from a height (25,28%, n=89), the second was pedestrians being struck by vehicles (17, 05%, n=60) and the third was the traffic accidents under unknown circumstances (14,77%, n=52). Compared with 2019, the most frequent trauma mechanism was falling from a height (26.5%), then the second and third most frequent mechanisms were pedestrians struck by vehicles (24.88%) and driver injured in transport accidents (21.83%). Noteworthy is the fact that there was no case of patient who was hit by train.

Conclusion: The most common trauma mechanism in 2019 and 2020 was falling from a height, followed by a pedestrian struck by vehicle. The prevalence of trauma was greater in males than in females.

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IONIZING RADIATION LATE – ONSET EFFECTS AND INCREASED NON-CANCEROUS CHRONIC DISEASE INCIDENCE IN CNPP CLEAN-UP WORKERS

Key words: ionizing radiation, chronic diseases

Objectives. More than 30 years have passed since the CNPP accident, we can now analyse the late – onset effects of radioactive exposure. Over 6000 people from Latvia were sent to Chernobyl from 1986 to 1991 to participate in CNPP clean-up works. During this time, the workers were exposed to both external and internal irradiation (¹³²Te, ¹³²Cs, and ¹³⁷Cs) varying, with certain exclusions, from 10.0 to 100.0 mSv.

Our objective is to evaluate different chronic non-cancerous diseases in Chernobyl patients and whether they are associated with late-onset ionizing radiation effects or lifestyle choices.

Materials and methods. The retrospective study included 95 patients (90 men, 5 women) aged 55–83 (average 66.43 median 65), all of whom were mobilized as CNPP clean-up workers from 1986 to 1988. All the above-mentioned patients received inpatient or ambulatory medical treatment at Pauls Stradins Clinical University Hospital in the period between June 2016 until January 2021, with their primary diagnosis listed as T66 (ICD-10, “Radiation sickness”) have been studied and summarized. The incidence and prevalence of chronic diseases including cardiovascular, neurological, nephrological, metabolic, pneumological and other organ system non-cancerous diseases in Chernobyl patients was determined. Online databases were searched using the relevant subject headings. Data analysis was performed using IBM SPSS Statistics 22 and MS Excel.

Results. Upon examination, the patients had 2–12 confirmed diagnoses (average 5.54, median 5), ranging from hypertension to chronic pancreatitis: 88.42% (n=88) had confirmed hypertension, 50.52% (n=48) – coronary artery disease/ischemic heart disease, 36.84% (n=35) – generalised atherosclerosis, and 33.68% (n=32) had confirmed osteoarthritis, 22.10% (n=21) had type 2 diabetes, 13.68% (n=13) had confirmed obesity, 28.42% (n=27) had encephalopathy, 6.31% (n=6) had suffered cerebral infarction, 25.26% (n=24) had chronic obstructive pulmonary disease (COPD), 11.57% (n=11) had bronchial asthma, thyroid pathologies – 12.63% (n=12) had goitre and 11.57% (n=11) had gout.

Conclusion. The extensive data on radiation dose, disease experience, and ancillary disease risk factors accumulated during the course of 30 years provides a wealth of information that can be mined for years to come to address a wide range of questions regarding the health effects of ionizing radiation.

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LATVIAN GENERAL PRACTICE PATIENT KNOWLEDGE ABOUT ANTIBIOTICS, ANTIBIOTIC RESISTANCE AND THEIR HABITS OF USE

Key words: antibiotics prescription, antibiotic usage, antibacterial resistance

Introduction. Antibiotic resistance is increasing to alarmingly high levels worldwide. New mechanisms of resistance are emerging and spreading. Many factors contribute to antibiotic resistance, including overuse, in which both healthcare professionals and patients play a major role.

Aim. To evaluate knowledge of Latvian general practice patients about antibiotics, their usage of antibiotics and awareness of antibiotic resistance.

Materials and methods. Descriptive cross-sectional study using questionnaire about antibiotics usage, side effects, resistance was carried out online. The Questionnaire included Latvian general practice patients over 18 years old.

Results. A total of 321 participants were included in the study. 12 participants or 3,8% have never used antibiotics in their lifetime and 36,5% used antibiotics at least once in last 12 months. Only 89,1% of patients had a prescription for their antibiotics and 31,6% had antibiotic leftovers after usage. 12,5% of participants consider possible to use antibiotics that had been prescribed for another person.

12,8% of participants consider that family practitioner should prescribe antibiotics for common cold and they lose their trust in their doctor if antibiotic treatment isn't started. 9,7% admitted that their family practitioner never explained them why the antibacterial treatment wasn't prescribed while therapy was started.

16,3% of respondents consider that antibiotics are effective for viral infection and 64,1% of participants have heard about antibiotic resistance and 4,9% consider that frequent antibiotic usage have no impact on antibiotic resistance.

Conclusion. The study showed that part of patients still have poor understanding of antibiotics and their effects. Patients admit of using antibiotic leftovers and losing trust in their doctor if antibiotic treatment isn't started. Almost a half of patients never heard of antibiotic resistance.

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LONG TERM, OFF-LABEL USE OF HIGH DOSES OF QUETIAPINE FOR INSOMNIA TREATMENT - CLINICAL SERIES STUDY

Introduction. The off-label use of medications is widespread in psychiatry. Differences in pharmacokinetics and pharmacodynamics explain why the efficacy and tolerability of neuroleptics differs so much between individuals. Quetiapine is a second generation antipsychotic known for its safety and efficacy in multiple psychiatric disorders, one of the most commonly prescribed antipsychotics for off-label indications (e.g. insomnia, anxiety, etc.). The maximum licensed dose of quetiapine across diagnostic indications is 800 mg/day. In Latvia quetiapine is licensed for treatment of schizophrenia and bipolar disorder; pharmacogenetics testing and antipsychotic blood level detection are not available in clinical practice.

Aim. To describe the outcome of long term use of higher - then - recommended doses of quetiapine.

Method. A case-based clinical series study of three patients with refractory insomnia.

Results. We report a clinical series of three patients who self-adjusted high and ultra-high doses of quetiapine for insomnia treatment: females (born in 1965 and 1986) and male (1962), who used quetiapine 900–1200mg at bedtime for years (from 2 up to 10 years). The patients did not meet criteria for any other disorder; they insisted to continue treatment, because the cessation of the therapy or even tapering off had a devastating effect on their quality of life. The general criteria for off-label prescribing were met. Clinical examination and laboratory tests did not reveal any obvious side effects. Possible reasons for high tolerability of quetiapine are discussed.

Conclusions. The high and ultra-high doses of quetiapine have demonstrated to be safe in long term use. The concomitant factors (like smoking, previous use of CYP inducers, etc.) should be taken into consideration when planning maintenance treatment. Further research is needed to explore the challenges of off-label use and higher-than-recommended doses use in practice. National guidelines for prescribing off-label have to be issued.

Acknowledgements. We acknowledge patients for their consent to publication.

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MENSTRUAL SYMPTOMS AMONG YOUNG WOMEN AND IMPACT ON EDUCATIONAL ATTAINMENT IN LATVIA

Objectives. While some women manage their monthly periods easily, others experience a number of physical and emotional symptoms. Painful menstrual periods are one of the main reasons for gynaecological consultation amongst young women. As it is an important female health aspect with possibly negative impact on school activities and psychological status, the aim of the study was to determine what menstrual symptoms (MS) young women experience and whether they have an impact on educational attainment and everyday life.

Materials and method. A cross-sectional study was conducted online, distributed on social network *Facebook* in March 2021. Data were collected from 304 self-filled questionnaires in *GoogleForms* of high school and university female students, further analyzed with SPSS 26.0.

Results. Mean age of respondents was 21.3 years (SD 3.3, range 15–33) and majority of them were university students (73%, n=222). Most common MS were described as menstrual cramps in lower abdomen (87.2%, n=265) and mood swings (70.1%, n=213). Pain was categorized in a scale from zero (no pain) to five (unbearable pain). 45.7% (n=139) described pain as “0/5 none”, “1/5 light” or “2/5 medium”, but without impact on daily activities. Pain level 3/5 and higher had impact on everyday life and was experienced by 54.3% (n=165) of women. 9.5% (n=29) experienced even 5/5 unbearable pain. Due to the severe menstrual pains, 8.6% (n=26) have sought emergency medical care. Vast majority of respondents (89.1%, n=271) use medication to relieve MS, such as ibuprofen (82.3%, n=223) and drotaverine (38.4%, n=104). Significant effects on education were observed, as 79.6% (n=242) admitted having difficulty to focus on studies during period days and 48.7% (n=148) have skipped classes and school days because of MS. Higher overall pain level (3/5 and higher) correlates with attention difficulties ($p < 0.001$) and unattendance of studies ($p < 0.001$). More than half of women (53%, n=161) believe that menstrual pain is the norm and no additional attention needs to be paid to it. Three in four women (73.4%, n=223) have reached out for help to reduce MS, but only for half of them (56.4%, n=155) symptoms decreased as result.

Conclusions. Menstrual cramps are identified as the most common of MS among young women students and has significant impact on academic performance. Pain during period is underrated and it is crucial to focus on strategies to improve pain and symptom management, therefore, to improve the quality of life of young women.

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N-RATIO AFFECTS SURVIVAL IN PATIENTS WITH GASTRIC CANCER AFTER GASTRECTOMY WITH EXTENDED LYMPHADENECTOMY

Key words: gastric cancer, lymph node ratio, gastrectomy, lymphadenectomy

Introduction: Gastric cancer is the third most common cause of cancer-related deaths in the world. To determine the outcome of gastric cancer after curative surgery, International Cancer Control (UICC)/American Joint Committee on Cancer (AJCC) tumor, lymph node, metastasis (TNM) staging system is used, however this system has its limitations and therefore a new prognostic factor was introduced, ratio between metastatic and examined lymph nodes: N-ratio. Its role is to determine more precisely the prognostic outcomes after radical gastrectomy with lymphadenectomy.

Aim: To find out N-ratio influence on survival in patients with gastric cancer after gastrectomy with extended lymphadenectomy.

Materials and methods: A Retrospective study that analyze 275 cases from 2014 – 2015 that was conducted at the Oncology Center of Latvia. Patients with gastric cancer, who underwent gastrectomy and extended lymphadenectomy, were enrolled. N-ratio was set accordingly from other research results [1], respectively: N-ratio 0 = 0%, N-ratio 1 = 1%-25%, N - ratio 2 = >25%. In the current study: gender, age >65 and <65 years, tumor localization (cardia, corpus, antrum), surgery type (total, subtotal gastrectomy), histological differentiation grade (G1, G2, G3), tumor depth, lymph node stage, TNM stage, lymph vessel and blood vessel invasion, Lauren classification (intestinal, diffuse, mixed), lymph node ratio and overall survival were analyzed. Statistical analysis was performed with SPSS 22.0 by using Kaplan-Meier statistical analysis, Log-Rank test, Cox proportional regression analysis and spearman correlation test. The level of statistical significance was set at $p < 0.05$

Results: From 275 patients 51.6% (n=142) were males, 48.4% (n=133) were females. Mean patient age was 65 (SD=12.2) years and median patient age was 67 years. Patients who had >65 were 57.1% (n=157) and patients who had <65 were 42.9% (n=118). The mean of total dissected lymph nodes was 25 (SD=14.6) lymph nodes and the median of total dissected lymph nodes was 23 lymph nodes. Median overall survival (mOS) was 20 months (95% CI 16.111 – 24.889). mOS using N-ratio: N-ratio 0 mOS =68 months, N-ratio 1 mOS=19 months, (95% CI 13.384 – 24.616), N-ratio 2 mOS =7 months (95% CI 4.687 – 9.313). The differences between the survival lines were statistically significant ($p=0.001$). mOS using lymph node stage: N0 mOS was 68 months, N1 mOS = 17 months (95% CI 0.000 – 35.908), N2 mOS = 16 months (95% CI 10.928 – 22.072), N3 mOS = 8 months (95% CI 4.614 – 11.386), ($p=0.001$). Using Cox proportional regression analysis for all prognostic factors it was found out that N-ratio is an independent prognostic factor - N-ratio 1: HR=1.786 ($p=0.03$); N-ratio 2: HR = 4.349 ($p=0.001$), however lymph node stage was not found as an independent prognostic factor and was statistically insignificant ($p=0.625$, $p=0.532$, $p=0.897$ and $p=0.854$ respectively). Using Spearman's correlation analysis - it was found that there is a very weak positive and statistically insignificant correlation between total dissected lymph nodes and N-ratio ($r=0,107$, $p=0,078$), however for lymph node stage it was found that there is a weak positive and statistically significant correlation between lymph node stage and total dissected lymph nodes ($r=0.230$, $p=0.001$).

Conclusions: Lymph node ratio is an independent prognostic factor that predicts more precisely radical gastrectomy outcomes, than N factor. Lymph node ratio also does not have any correlation with total dissected lymph nodes, meaning that it does not change its stage and therefore it can more precisely predict the stage and outcome. The median overall survival for N-ratio and N-factor is equal.

1. Pedrazzani, C., et al., *Ratio Between Metastatic and Examined Lymph Nodes (N Ratio) May Have Low Clinical Utility in Gastric Cancer Patients Treated by Limited Lymphadenectomy: Results from a Single-Center Experience of 526 Patients*. World Journal of Surgery, 2010. 34(1): p. 85-91.

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OBESITY OF PRESCHOOL CHILDREN IN RELATION TO NUTRITIONAL QUALITY AND PHYSICAL ACTIVITY

Introduction: Nowadays, there is a rising concern that the regularity of obese children is becoming a more apparent problem. The prevalence of obesity among children increased from 1% in 1975 to 8% of girls and 9% among boys in 2016. It is crucially important to timely detect and assess obesity in children to prevent further weight gain and minimize the risk of related health problems. Therefore it is essential to identify potential risk factors associated with malnutrition and lack of physical activity.

Aim: To study the obesity of preschool children in relation to diet and physical activity.

Results: Obesity is more common among boys than girls. 6 out of 10 boy participants had a higher BMI than normal. 30% (n=3) of boy participants were overweight (between 85th and 95th percentiles) and 30% (n=3) were obese (over 95th percentile). Looking at girl participants there is an improvement with 2 out of 10 having a higher BMI than normal. 10% (n=1) of girl participants were overweight, and 10% (n=1) were obese. One of the main risk factors for weight gain is an unbalanced diet. 9 children eat 4-5 times a day (4 boys and 5 girls), one child eats 6 times a day. 10 children eat 3 or fewer times a day. 3 out of 8 children with higher BMI than normal have bad eating habits – eating where, when, and how they want. According to the study data, the conclusion is that the children's nutrition is not wholesome. It directly affects their growth and development. The children's menu should not include sweets and sweetened sparkling drinks. Children spend more than 1-2 hours per day using a computer and watching TV. Two boys who were overweight spent 3 or more hours per day using a computer. Three overweight boys spent 3 or more hours watching TV. Boys also engage less in physical activities than girls. 4 out of 6 overweight boys don't engage in physical activities more than once a week.

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OCCUPATIONAL INJURIES AMONG EMERGENCY MEDICAL SERVICES EMPLOYEES

Key words: *Emergency medical employees (EMS), injuries, risk*

Objectives: The aim of the work was to study injury types, frequency, mechanism, causes, impact on daily activities, psychological condition and incapacity for work. Emergency medical employees – including paramedics and emergency transport drivers – carry out very dangerous jobs and are at high risk of injury on a daily basis.

Methods: The study used such a quantitative method as questionnaires, in general, information was collected from 100 RRC “BAC centres” employees. Further, descriptive processing of the data was performed, and the data were analyzed and collected using Hi-square test and the Fisher method. The following were compared: what localization injuries are more common according to gender; what injuries are more common depending on age; connection between job position and injury type; how seasonality affects injury frequency.

Results (Oral/Poster Only):

Data processing showed that there was no statistical difference between the incidence of injury and gender with 95% confidence. However, in the age group “over 35 years”, the most frequent localization of injury was head ($\varphi_e^* = 1.97$). By type of injury, “needle stub” occurred more often in the age group “18-25 years” ($\varphi_e^* = 3.08$). Due to the job position, “Needle stub” with 95% reliability was statistically significantly more common for medical assistants than for doctors ($\varphi_e^* = 2.09$) and for operative medical transport(OMT) drivers, the most common type of injury with 95% confidence was “Back injury”. No statistically significant correlation was found between seasonality and injury types.

Conclusions: The results of the study proved that EMS employees are exposed to a high risk of injuries, all of the 100 respondents had suffered work injuries of varying severity and degree. Important is, that the injuries of the majority of respondents affected their long-term health, as well as majority noted the negative impact of occupational injuries on their psychological condition.

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OLAPARIB MAINTENANCE MONOTHERAPY IN PLATINUM-SENSITIVE, RELAPSED OVARIAN CANCER WITH BRCA MUTATIONS

Background. Despite treatment strategies which include both surgery and chemotherapy, epithelial ovarian cancer often relapses and survival rates remain poor. Therefore, treatment goals include delaying symptomatic disease progression and prolonging survival. PARP inhibitor olaparib is approved for maintenance treatment of platinum-sensitive relapsed ovarian cancer. The aim of study was to assess progression-free survival and adverse events of olaparib tablet maintenance therapy in women with serous or endometrioid platinum sensitive ovarian cancer with *BRCA1* or *BRCA2* mutation.

Methods. This retrospective study includes 28 patients with confirmed BRCAm by local testing. Eligible patients should have received ≥ 2 prior lines of platinum-based chemotherapy and be in complete or partial response following their most recent course or have no evidence of disease. Patients did receive olaparib tablets (400 mg twice daily) until disease progression, unacceptable toxicity, or another discontinuation criterion. Data were processed using SPSS program.

Results. The mean age of patients was $52,18 \pm 6,51$ years (CI 95% 49,65 - 54,70). The median PFS for patients with relapse (17) was 21.65 months (95% confidence interval [CI]: 17.29-26.01 months), 2 patients were exitus after median 32.50 months on Olaparib therapy, 9 patients still receiving Olaparib with median PFS 31.22 months without relapse at the time the data were assessed. 15 (53,57%) had received ≥ 2 lines of prior chemotherapy. The most common AEs in the olaparib group were anaemia (n= 18, 64,28%), fatigue (including weakness) (n = 13, 46.43%), abdominal pain (n = 5, 17.86%) and vomiting (n = 4, 14.81%). Grade ≥ 3 AEs occurred in 6 (21.43%) of olaparib pts; the most common grade ≥ 3 AE was anaemia (n = 3, 10.71%) and neutropenia (n = 3, 10.71%). No deaths related to AEs were reported. AEs led to dose interruption in 1 patient (1%) for anaemia, none of the patients required dose reduction and treatment discontinuation.

Conclusion. Patients with platinum-sensitive, relapsed, serous ovarian cancer achieve substantial benefit from maintenance olaparib treatment regardless of baseline surgery outcome, response to chemotherapy, or BRCA mutation type. Olaparib has an acceptable and manageable safety profile in patients, AEs were generally low-grade anaemia and fatigue; manageable without discontinuation of olaparib treatment; and readily treated, empirically, by oncologists.

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PATIENT-TO-STAFF VIOLENCE IN MENTAL HEALTH SETTINGS IN LATVIA – UNDERREPORTED AND UNDERESTIMATED

Background. Violence towards staff in mental health settings has devastating effect on the quality of care. Number of violent accidents (VA) has to be monitored; corresponding risk management and support of the assaulted staff has to be provided. A great deal of VA are received while trying to restrain the patient. The anticipated number of VA in Latvia is approximately 370 cases annually or 1600 ones over a five years period.

Aim. To explore the national statistical data and characteristics of violence toward mental health staff.

Methods. State Labor Inspectorate data on staff injuries due to patients' aggression in mental health services for the last 5 years (2016–2020) were obtained and analyzed.

Results. Overall, 13 cases of VA were reported (1% of all VA in healthcare); that is far less than the anticipated number; the traumas were non-severe physical injuries only – e.g. trauma with severe bleeding, that required surgical treatment, long term sick leave. Predominantly VA took place in psychiatric hospital wards (10 or 77%); the vast majority of the assaulted staff were junior nurses (10 or 77%); no attacks on psychiatrist were reported; the most affected part of the body (9 or 69%) was head and neck region. Only one injury was received during the application of confining means. In two cases the staff member suffered while performing out of their job responsibilities.

Multiple VA the authors are informed about were underreported, such as: armed and unarmed attacks on psychiatrists and nurses both in outpatient and inpatient wards in state largest mental hospitals. Verbal assault on forensic psychiatrist was not reported as well (a guilty verdict was rendered by court).

Conclusion. Underreporting the cases of VA, underestimating of the trauma severity, neglecting nonphysical injury is detected.

Further research is needed to explore the barriers to reporting of the VA; the principles of the severity assessment should be reviewed.

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PEPTIC ULCER BLEEDING IN PATIENTS WHO USE NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Key words: NSAID, peptic ulcer bleeding, acute gastrointestinal bleeding

Objectives. Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used medications, however NSAIDs use is associated with an increased risk of peptic ulcer disease (PUD) and acute peptic ulcer bleeding (APUB). The aim of this study was to evaluate the risk of bleeding from peptic ulcer in patients with and without prior NSAID therapy.

Materials and methods. Prospective study of patients over 18 years of age who were consecutively hospitalized in a tertiary center in Latvia – Riga East Clinical University Hospital with APUB from 2019 to 2020. Data were collected from interviews and medical records: age, gender, history of NSAID use, Forrest classification, hospitalization time, admission to intensive care unit (ICU), number of hospitalizations, received treatment and outcome. Data were analyzed using IBM SPSS 20.0.

Results. From 46 patients 24 (52.2%) were females (mean age 67 ± 16.67 years) and 22 (47.8%) males (mean age 53 ± 14.60 years). Prior NSAIDs therapy received 22 (47.8%) patients (mean age 54 ± 15.90 years), but 24 (52.2%) did not (mean age 66 ± 16.28 years). Patients with APUB and prior NSAIDs therapy did not show statistically significant difference in bleeding severity according to Forrest classification, in hospitalization time (including time in ICU), in number of hospitalizations, in need for surgical treatment or mortality in a comparison with patients without prior NSAIDs therapy ($p > 0.05$). Patients with prior NSAIDs therapy did not show statistically significant association with more often use of adrenaline, hemostatic spray, thermocoagulation or embolization ($p > 0.05$). Statistically significant difference was found in received clips among NSAIDs users ($p = 0.002$).

Conclusions. NSAIDs users received more clips during acute endoscopy. There was no difference found regarding disease outcomes in both groups.

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PHYSICAL PREVENTION AND REHABILITATION ALGORITHMS IN OVERWEIGHT, OBESITY AND CELLULITIS

Overweight, obesity and cellulitis are considered as a serious health and cosmetic problem, with serious consequences on the quality of life.

Physical medicine and rehabilitation can be useful in the process of prevention and rehabilitation of these patients, applying different physical modalities:

from the group of natural physical factors: temperature; water and peloids; active exercises and massage (including vacuum massage, manual lymphatic drainage and lymphopressotherapy; sports and physical activities); and the corresponding parts of PRM (cryo- / thermotherapy; balneo- and peloido-therapy; physiotherapy and ergotherapy); from the group of pre-formed physical factors: electrical currents of low, medium and high frequency; electrostatic field (Deep Oscillation); phototherapy, including laser; ultrasound; and the correspondent parts of PRM (electrotherapy, lasertherapy, ultrasound-therapy).

In the complex prevention and rehabilitation algorithm, we include: physical activities and sports; exercises (analytic exercises for abdominal belt, for gluteal and femoral muscles); ultrasound-cavitation and phonophoresis with anticellulite gels; endermology (LPG); functional electrical stimulations; radio-frequency, VelaShape; diet and patient education.

We applied complex prevention and rehabilitation algorithms using a synergic combination of different physical factors: augmentation of the regular physical activity, exercises, one soft-tissue technique (lymphopressotherapy or post-isometric relaxation); two preformed modalities; one cryo or thermo-agent.

We present series of clinical cases suffering from overweight and cellulite; before and after application of a rehabilitation complex. Our results include: amelioration of the skin elasticity and of the “orange peel”; decrease of the body-mass index, reduction of the waist circumference).

We propose a hypothesis of the mechanisms of action of physical modalities on overweight, obesity and cellulitis.

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POLYTRAUMA MECHANISMS BASED ON ALCOHOL INTAKE IN LATVIA – RIGA EAST UNIVERSITY HOSPITAL “GAILEZERS” IN 2020

Aim. The aim of the research was to analyze alcohol consumption and relation with injury mechanisms in polytrauma patients admitted to largest polytrauma unit in Latvia – Riga East University Hospital “Gailezers”.

Background. Alcohol consumption increases the risk of accidents that can lead to severe injuries. Polytrauma is condition of a person who has been subjected to multiple traumatic injuries and is life threatening.

Methods. Retrospective data analysis was performed using IBM SPSS. Data were collected from January, 2020 to December, 2020. In total 352 patients were admitted to the polytrauma ward. Blood alcohol concentration was from 0 to 4,47. Injury mechanisms were divided into 12 categories, however detailed analysis were performed only on five most common injury mechanisms and in the end compared with each other based on alcohol concentration.

Results. Approximately 35.23% (n=124) of the patients who were included in the study were under the influence of alcohol and 64,77% (n=228) were sober. In total, the mean value of promiles were 2,19%, for women (n=30) it was 1.82% but for men (n=94) 2.31%, accordingly, in this study higher alcohol concentration was observed in male patients. The most common trauma mechanism in which alcohol level was the highest was fall down the stairs 2.63% (n=4), second most common was pedestrian struck by vehicle 2.62%. (n=22) and third was assault 2,5% (n=5), less common – falls 2,26% (n=3) and motorcycle accidents 2,21% (n=9).

Conclusion. Alcohol consumption affects outcome of polytrauma and the highest alcohol levels were observed in falls from height.

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PREDICTIVE ROLE OF CHA₂DS₂-VASC SCORE FOR SINUS RHYTHM MAINTENANCE PROSPECT EVALUATION AFTER ELECTRICAL CARDIOVERSION IN PATIENTS WITH HIGH-RISK ATRIAL FIBRILLATION

Key words: AF, ECV, SR maintenance, CHA₂DS₂-VASC

Introduction. Atrial fibrillation (AF) is increasing healthcare burden. Electrical cardioversion (ECV) is option for rhythm control. Nevertheless, progressive self-maintaining nature of arrhythmia is associated with therapeutic resistance. CHA₂DS₂-VASC score, primarily thromboembolic risk evaluation tool, reflects cumulative role of specific pathogenetic factors, potentially leading to impaired long-term sinus rhythm (SR) maintenance outcomes.

Aim. To evaluate role of CHA₂DS₂-VASC score value for SR maintenance prospects after ECV in patients with high-risk AF.

Materials and Methods. Patients were enrolled in Latvian Centre of Cardiology. Main criteria were diagnosis of high-risk AF (defined as CHA₂DS₂-VASC ≥3 for women and ≥2 for men, according to ESC

Guidelines), hospitalization for ECV and successful SR conversion. Baseline information on demographics, medical history, medication intake was obtained according to questionnaire. 1-, 3-, 6-, 9-, 12-month follow-up interviews were conducted, with focus on SR maintenance and patient adherence. Data analysis was carried out using SPSS software. Cutoff value of 3 for CHA₂DS₂-VASc was set and one-year SR maintenance odds estimation was defined as main endpoint, performing logistic regression analysis ($\alpha=0.05$).

Results. Among 122 participants, 44.3% were women and 55.7% – men. Median CHA₂DS₂-VASc was 4 (IQR3-5.25) among women and 2 (IQR2-4) among men. Total SR maintenance rate comprised 53.3%. When analyzing outcomes for women, CHA₂DS₂-VASc 3 did not have significant impact on SR maintenance likelihood ($p=0.159$). Among men, CHA₂DS₂-VASc ≤ 3 significantly influenced prospects to maintain SR ($p=0.032$), with paradoxically decreasing tendency (OR0.296, 95%CI0.098-0.898). Additionally performing analysis with different medications as covariates in multinomial regression, significant effect of mineralocorticoid receptor antagonist (MRA) intake was established ($p=0.034$) with remarkable increase in SR maintenance odds (OR4.597, 95%CI1.124-18.793) for men.

Conclusions. CHA₂DS₂-VASc score demonstrated potential as significant marker for ECV long-term success among men, with discordant association observed, presumably attributed to pathogenetical contribution of indirect antiarrhythmic action of MRAs and elimination of AF-relapse predisposing changes related to comorbidities represented by CHA₂DS₂-VASc score.

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PRINCIPLES OF ACUTE URINARY TRACT INFECTION ANTIBACTERIAL THERAPY IN FAMILY MEDICINE PRACTICES

Key words: urinary tract infection, antibacterial therapy, acute cystitis

Objectives. Urinary tract infection is the most common infection in the female population. Most often the family doctor is the first specialist who treats these patients. In most cases, antibacterial therapy is prescribed without urine test or inoculation. According to the new guidelines, fluoroquinolones are not the first choice for the uncomplicated urinary tract infection, because of the side effects. The main goal of this study is to identify the most commonly prescribed antibacterial medications for acute cystitis in family medicine practices and compare them with guidelines from the European Association of Urology.

Materials and methods. This was a retrospective study. There were included women with acute cystitis from family medicine practices from January 2019 until December 2019. There were analysed acute cystitis episodes per year, prescribed antibiotics and use of supplements. The data was analysed using SPSS and Microsoft Excel. The study was performed according to the European Association of Urology guidelines.

Results. In total 46 women were included in the study. The mean age was 51 ± 18.3 years. On the first visit 15 (32.6%) of all events resulted in therapy without the use of antibiotics, instead there were prescribed supplements. In 31 (67.4%) of all cases antibiotics were prescribed. The prescribed antibiotics in 24 (52.2%) cases were nitrofurantoin, fluoroquinolones in 4 (8.7%) cases and only in 3 (6.5%) cases fosfomycin. Twenty seven (87.1%) patients received antibacterial therapy according to the guidelines. In 4 (12.9%) cases prescribed antibiotics did not accord to the guidelines.

In the same year 12 (26.1%) patients had a recurrent urinary tract infections. In this episode all of these patients were prescribed antibacterial therapy. Six (50%) patients were prescribed fluoroquinolones, 4 (33.3%) – nitrofurantoin, 2 (16.7%) – fosfomycin.

Conclusion. In the most cases antibacterial therapy is prescribed according to the guidelines from the European Association of Urology. There is a need to avoid the use of fluoroquinolones to treat acute cystitis.

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PSYCHOLOGICAL ASPECTS OF ADOLESCENT EATING DISORDERS

Introduction. Adolescents are at higher risk for eating disorders compared to the general population. Few research papers review the link between the eating disorder and the psychological factors in the adolescents population. And there are no studies that investigate the problem for the Latvian population.

Aim of the study. This study aims to measure the causation between eating disorder among Latvian adolescents and their perfectionism, self-esteem, and body image flexibility.

Materials and methods. We asked multiple schools to give adolescents to fill a questionnaire electronically, voluntarily. We received 165 valid responses from the respondents in age 14 to 19, from whom 132 were females and 33 males. The questionnaire consists of demographic data, SCOFF questionnaire, Eating Disorder Examination-Questionnaire (EDE-Q), Rosenberg Self-Esteem Scale (RSES), Almost Perfect Scale-Revised (APS-R) and Body image-acceptance and action questionnaire (BI-AAQ). The main statistical methods we used were ANOVA, Kruskal-Wallis test, Wilcoxon test and generalized adaptive model.

Results. We find statistically significant results between the eating disorder and each psychological factor ($p < 0.0001$ in each case). There is a strong correlation between adolescents body image inflexibility and the eating disorder examination score ($r = 0.90$). There exists a positive link between maladaptive perfectionism and the eating disorder examination and a negative effect between adaptive perfectionism and the eating disorder. There is a negative relation between adolescents self-esteem and their eating disorder examination results.

Conclusion. Results of this study showed that there is a link between disordered eating and perfectionism, low self-esteem and body image inflexibility.

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RELATIONSHIP BETWEEN COMPLICATIONS AND DURATION OF ANESTHESIA IN THE EARLY POSTOPERATIVE PERIOD AFTER PRIMARY TOTAL HIP AND KNEE REPLACEMENT

Introduction. The most effective method of hip and knee osteoarthritis treatment is arthroplasty. Patients, who are obese, have a significantly increased risk of developing surgical complications in the postoperative period.

Objective. To determine increase in the duration of anesthesia and the number of complications after hip and knee replacement in obese patients ($BMI > 30 \text{ kg/m}^2$).

Materials and methods. The retrospective study included patients histories who underwent 300 total hip and 300 total knee replacement from 2017 to 2019. Patients ranged in age from 29 to 90 years. Statistical analysis of the data was performed using IBM SPSS version 21.0, the descriptive statistical method was used, statistical significance was considered if the statistical reliability was $p < 0.05$. BMI was defined in three categories - normal weight ($< 24.99 \text{ kg/m}^2$), overweight ($25-29.99 \text{ kg/m}^2$) and obesity ($> 30 \text{ kg/m}^2$). Complications were divided into five categories - increase blood loss, wound local reaction, mechanical, thrombotic and other complications.

Results. The mean age in TKR was 68.10 years for men and 69.07 years for women, statically not significantly different ($p = 0.396$), while in THR it was - 60.78 years for men and 68.13 years for women ($p = 0.216$). The average duration of anesthesia in the case of TKNR ranged from 3:01 (h: min) to 3:03, statically not significantly different ($p = 0.390$), the shortest time spent in anesthesia was found

at BMI <24.99 kg/ m². At THR, the average duration of anesthesia was from 2:36 to 2:50, statistically significantly different (p = 0.0092) 2017 from 2019. Patients, who was undergoing TKR, normal weight was 5.67% (n = 17), overweight was 25.33% (n = 76) and obesity was 69% (n = 197), with complications ranging from 24% to 29%. At THR, 27% (n = 81) of patients were normal weight, overweight 36.67% (n= 110) and obese 36.33% (n = 109), with complications ranging from 19% to 22%.

Conclusions. The duration of anesthesia is increased in THR if the BMI>30 kg/m² (34%–37%), while the data of TKR were variable and the longest BMI was 25–29.99 kg/m² (22%–31%). The most common complications of all complications in TKR were increase blood loss (12% to 15), wound local reaction and other categories complications while with THR –increase blood loss (18% to 19%). Patients with BMI>30 kg/m² have a very high risk of developing postoperative complications in THR surgery (p<0,001) and TKR (p<0,001) but only in 2017 (p=0,059) patients have very high risk, if BMI was 25–29.99 kg/m².

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REMOTE LEARNING INFLUENCE ON SLEEP HABITS OF 12TH GRADE STUDENTS IN LATVIA

Aim of the study: to determine and analyze sleep habits – self reported sleep time, daytime sleepiness, ability to fall asleep and sleeping daytime naps in 18 year old 12th grade students in Latvia.

Materials and methods: a prospective cross sectional study was carried out in year 2020. and 2021. Data was collected using Google spreadsheet, that was sent to all general secondary education institutions. Data analysis was carried out using Microsoft Excel and IBM SPSS programmes. Anova and T-test were used for analysing going to sleep and wake up time and time spent on studying and interest education. Chi - square was used to analyse nominal values. Statistical significance was considered if p<0,005.

Results: 274 valid questionnaires were obtained, of which 201 (73.4%) had been completed by women. It appeared that, before the pandemic, students spent an average of 28 (± 35) minutes on their way to school. Before pandemic respondents spent 7:24 (± 2:29) hours on studying and 2:16 (± 2:09) hours on interest education. During pandemic women respondents spent an average of 7:37 (± 2:42) hours on studying, men 6:42 (± 2:47) hours an average of 1:16 (± 1:33) hours on interest education. Consequently, total occupied time decreased by 1:14 (± 2:15) hours for women and 2:12 (± 3:41) for men. It was observed that the average night sleep time for both women and men on working day nights was below the age recommended, while on holiday according to the age recommended.

On at least one day, 74 respondents reported taking a nap during day. A statistically significant relationship was observed between daytime naps and difficulty to fall asleep, a lower amount of sleep at the following night and higher daytime sleepiness in next day. A lower amount of sleep during the previous night and a higher level of daytime sleepiness, in turn, had a statistically significant impact on the probability of taking daytime nap during that day.

Conclusions: during Covid - 19 pandemic, the amount of student night time sleep had not increased due to the time saved in the morning. On the other hand, the effects of daytime naps were observed on the circadian rhythm shift and the limits imposed by the emergency situation made it possible for pupils to take daytime naps. Taking daytime naps was associated with a later night sleep time, which in turn caused taking daytime naps the following day, what again caused later night sleep time. Consequently, it can be concluded that taking daytime naps contributed to a more pronounced shift in circadian rhythm.

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SPINAL MUSCLE TENSION DIFFERENCE BETWEEN STANDING ON HARD FLOOR AND STANDING ON THE ANTI-FATIGUE MAT

Objectives. This study focuses on comparison of spinal muscle *m. erector spinae longissimus* tension bilaterally between standing on anti-fatigue mat and hard floor while wearing shoes with 3cm high heel.

Materials and methods. Ten healthy young participants were tested, while standing for 10 minutes on hard floor and anti-fatigue mat each and wearing 3cm heel shoes. During these 10 minutes they were typing text on a computer standing at the desk in front of them. Muscle electric activity in *m. erector spinae longissimus* (MESL) in period of 1 minute from every take was measured bilaterally. Subjects were tested using surface electromyography with wireless electrodes (BTS FREEMG 1000, BTS bioengineering), and manufacturer-provided signal processing computer program. 10-second periods with the smoothest measurement from every trial were analysed using Microsoft Excel and the SPSS statistics 26 program.

Results. The higher voltage in the muscles was observed while standing on the anti-fatigue mat. The effect was similar in both sides of MESL. Left MESL voltage median on the floor was 8.89 μ V (interquartile range Q1-Q3 was 5.79–10.87), but on the mat it was 10.49 μ V (8.18–12.88). Right MESL median on the on floor was 7.82 (interquartile range Q1-Q3 was 18–17.63) μ V, but on the mat it was 10.86 (9.49–23.90) μ V. Statistically significant difference was found between standing conditions in both left MESL ($p=0.005$) and right MESL ($p=0.005$).

Conclusions. The study verified that *m. erector spinae longissimus* had significant response to the anti-fatigue mat. Electrical activity was released more prominently when standing on the anti-fatigue mat in comparison to standing on hard floor. The uneven elastic surface of antifatigue-mat may be causing micromovements in order to gain stability. This way, more micromovements are provoked causing improvement of spinal muscle microcirculation and nutrition flow thus reducing fatigue.

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THE ANALYSIS OF INFECTIOUS KERATITIS CAUSATIVE AGENT IN PATIENTS WITH CORNEAL TRANSPLANTATION

Key words: corneal transplantation, infectious keratitis, infection

Objectives. Corneal transplantation (keratoplasty) is a common surgical procedure that helps patients restore functional vision by replacing diseased or scarred corneal tissue with healthy tissue from an organ donor. The aim of the research was to investigate the most common causes and causative agents of corneal transplantation in the period from January 2018 to December 2019 in Pauls Stradiņš Clinical University Hospital.

Materials and methods. The study was a retrospective analysis of data gathered from patient medical records and included 68 patients who received a corneal transplant in the period from January 2018 to December 2019. Data were analysed using Microsoft Excel and descriptive statistic methods in IBM SPSS Statistics 26.0.

Results. Out of total of 68 medical records, 66,2% belonged to female and 33,8% to men. The mean age was 64,01. 51,5% of cases included left eye corneal transplantation, but 48,5% – right eye corneal transplantation. In all cases full-thickness penetrating keratoplasty were applied. The most frequent

transplantation causes were infectious keratitis – in 39,6% of cases, bullous keratopathy – in 32,4% and trauma – in 14,7% of all cases. Detailed analysis of infectious keratitis causes showed, that in 48,1% of cases the causative agent was bacteria, followed by virus – in 33,3%, fungus – in 11,1% and mixed bacterial and fungal infection – in 7,4%. The most frequent infectious keratitis agents were *Streptococcus* spp. – 37% (Beta-hemolytic *Streptococcus* spp. in 9 cases and *Streptococcus pneumoniae* in one case), herpes virus – 33,3% (9 cases) and fungal infection – 11,1% (3 cases), followed by *Staphylococcus* spp. (2 cases – 7,4%), mixed *Staphylococcus* and fungus infection (2 cases – 7,4%) and *Stenotrophomonas maltophilia* (1 case – 3,7%). The additional manipulation during corneal transplantation operation was used in 23 cases (33,8%) and the most common manipulation was lensectomy with IOL implantation in posterior chamber (47,8%).

Conclusion. Our study showed that the main cause of corneal transplantation was infectious keratitis and the most common infectious agents were *Streptococcus* spp., herpes virus and fungi. Bullous keratopathy and trauma are the other common causes of corneal transplantation.

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THE EFFECT OF LATVIAN SAUNA AND CLASSICAL SAUNA ON THE CARDIOVASCULAR SYSTEM IN WOMEN: CASE STUDY

Recent evidence suggests that sauna treatments can reduce and prevent the risk of acute and chronic diseases, including dementia (Knekt, 2020; Laukkanen, 2018).

In Bulgaria, in health tourism these are natural resources that are mainly used, such as sludge, mineral water springs, and saunas (Koleva, 2020). Latvia is not so rich in natural resources that can be used in water therapy; however, this type of health-promoting therapy can be implemented in a Latvian sauna.

Latvian sauna is a type of natural therapy that facilitates the improvement of not only psycho-emotional, but also physical condition. The Latvian sauna ritual includes the use of herbal sauna brooms, natural scrubs and is performed at the temperature of 55° C, while the classical sauna ritual is performed at the temperature of 75°.

The aim of the research is to analyse the Latvian sauna, which includes the use of herbal sauna brooms and natural scrubs, and the effect of the classic sauna on the cardiovascular system in women in the age groups 30–40 and 50–60.

A qualitative study was carried out focusing on a comprehensive study of the phenomenon (Latvian sauna and classic sauna). The selection was made taking into account the inclusion criteria; the participants' written agreements were obtained. The empirical part of the study involved ten women, five women aged 30–40, and five aged 50–60. The research methods used: POMS psycho-emotional test, Orthostatic test, Clinostatic test, Latvian sauna at 55° C, Classic sauna at 75° C, Arterial blood pressure and Heart rate measurements, Statistical data processing.

Results.

After the sauna, all the subjects' psycho-emotional state improved, and the signs of fatigue disappeared. After the clinostatic and orthostatic examination it was determined that only one subject in the age group 50–60 had increased nervous system tone before Latvian and classic sauna, but after the sauna the nervous system tone and irritability returned to normal.

In the study, the heart rate of women aged 30–40 and 50–60 after the Latvian sauna according to the physical activity intensity norms adopted in the Strath et al is described as a very light physical activity.

After the classic sauna, the heart rate increased in women aged 30–40, but in women aged 50–60, the heart rate decreased.

The results of the blood pressure measurements varied both in different age groups and after taking different saunas.

THE EFFECT OF VITAMIN D ON THE COURSE OF RHEUMATOID ARTHRITIS

Key words: *rheumatoid arthritis, vitamin D, anti-CCP, RF, DAS28*

Objectives. Vitamin D deficiency has been implicated in pathogenesis of many autoimmune diseases, including rheumatoid arthritis (RA). It has been found to be associated with development of the disease, however, the evidence from epidemiological studies concerning the relationship between serum vitamin D concentrations and RA is inconsistent.

This study aims to evaluate vitamin D impact on RA course and does RA treatment affect vitamin D level.

Materials and methods. 80 RA patients were included and tested on RF, antiCCP, CRP and serum vitamin D level. Patients completed a questionnaire on the course of the disease and received treatment. Disease activity score 28 (DAS28) was calculated.

Results. Vitamin D level was insufficient in 40% of patients. 77.5% of RA patients were taking vitamin D supplements. The absence of supplementation of vitamin D was related to higher prevalence of vitamin D deficiency ($p=0.001$). Levels of vitamin D had negative correlation to swollen joint count ($r=-0.096$, $p=0.39$) and VAS score ($r=-0.119$, $p=0.29$). There was no correlation between vitamin D level and DAS28 ($r=+0.035$, $p=0.759$). The duration of vitamin D supplementation had negative correlation to CRP level ($r=-0.105$, $p=0.418$). All patients who did not report current joint pain were taking vitamin D supplements ($p=0.05$). Vitamin D insufficiency was associated with higher CRP ($p=0.347$), RF ($p=0.728$) and antiCCP ($p=0.604$) levels. The prevalence of vitamin D insufficiency was higher in those receiving NSAIDs (52%, $p=0.229$), glucocorticoids (52.4%, $p=0.394$) and adalimumab (47.1%, $p=0.370$) than other therapies. There was no association between vitamin D and stage of RA, as well as RA extra-articular manifestations.

Conclusions. The study data suggest that vitamin D level may affect RA activity and aggressiveness. Most medications used to treat RA do not significantly affect vitamin D depletion.

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THE IMPACT OF ANATOMICAL AND SIZE VARIATIONS OF PULMONARY VEIN ORIFICES IN THE LEFT ATRIUM ON THE ELECTRICAL ACTIVITY OF THE HEART

Background. The sleeves of atrial muscle found around pulmonary vein (PV) orifices are known to be the site of focal electrical activity leading to atrial fibrillation (AF). Therefore, the evaluation of PV orifice size and orientations is extremely important for ablation procedure, widely used as an AF treatment method.

Aim. The aim of the study was to find associations between PV orifice anatomical and size variations in relation to electrical activity of the heart.

Methods. The retrospective study included 145 patients, who underwent surgical treatment of peripheral artery disease. The cardiac multi-slice CT scan analysis was performed by making a 3D reconstruction model of the left atrium and by analyzing the orientation and size of PV orifices.

Results. Mean age of patients was 66.9 years (SD = 7.9), 75.2% (109) were men. From the all patients, 77.3% (112) had two PV orifices on the left side, but 22.7% (33) had one common left PV connecting to the left atrium. On the right side, 86.2% (125) had 2 PV orifices, 11.7% (17) had 3 orifices, 1.4% (2) had 4 orifices and 0.7% (1) one common PV. The number of the left PV orifices had statistically significant distribution differences among ECG P wave notching groups in II lead ($p=0.026$), but the number of

the right PV orifices had a positive correlation with P wave axis ($r_s=0.239$, $p=0.008$). The distance between two PV orifices on the right side negatively correlated with the amplitude of ECG P wave ($r_s=-0.193$, $p=0.047$). Among the patients, who had one common PV on the left side, there was found a correlation between mean diameter of PV orifice and ECG PP interval ($r_s=-0.425$, $p=0.024$) and ECG RR interval ($r_s=0.430$, $p=0.022$). In the group of patients, who had more than one right PV orifice, there was found a correlation between mean diameter of the right inferior PV orifice and ECG P wave amplitude ($r_s=0.200$, $p=0.027$).

Conclusions. The results of the research demonstrate important associations between PV orifice characteristics and electrical activity of the heart.

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THE IMPACT OF INTIMATE AREA HYGIENE IN WOMEN'S GYNECOLOGICAL HEALTH AND WELL-BEING

Key words: *gynecology, health, women, vaginal pH*

Introduction. Women's vaginal flora is important health issue, since it is influenced by different factors as stress, hormonal changes, diet, lifestyle, hygiene etc. Changes in vaginal flora potentially increase risk of infections, have impact on fertility and women's well-being. An acidic vaginal pH and lactobacilli are components of multiple mechanisms to sustain normal vaginal flora.

Aim. The aim of this study is to investigate the role of intimate hygiene products on vaginal pH, as well as subjective symptoms of vaginal discomfort.

Materials and methods. Double-blinded, randomized prospective study of 52 women in reproductive age with no subjective symptoms of genital tract infection. 26 women used newly designed product "X" and other 26 women used already existing product "Y". Use of products were blinded for researchers and participants. Participants used the same intimate hygiene products for 4 weeks. Vaginal pH was measured on first enrollment visit and after four weeks of product use. During the study once a week participants filled out the questionnaire about intimate hygiene product use.

Results. When compared results show decreased (more acidic) or unchanged pH levels in between visit N. 1 and visit N. 2 measurements. The end result is in the process.

Conclusion. Use of specifically designed intimate hygiene products can improve vaginal pH towards more acidic, potentially improving vaginal flora.

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THE IMPACT OF PHYSICAL ACTIVITY ON HEMOGLOBIN A1C (HBA1C) LEVEL

Key words: *physical activity, International Physical Activity Questionnaire (IPAQ), HbA1c, diabetes mellitus*

Introduction. World Health organisation recommends at least 150–300 minutes per week of moderate-intensity aerobic physical activity for people with chronic conditions (WHO, 2020).

Aim. The aim was to study the level of physical activity of people with diabetes. And to know does the more often and more intensive physical activities automatically mean lower HbA1c level.

Materials and methods. A retrospective cross-sectional study, which surveyed 80 patients using a IPAQ short version. Respondents were asked to evaluate their physical activities in the last 7 days. And using medical records from patient cards in GP practice. The obtained data were processed with Microsoft Office Excel 2010 and SPSS 21.

Results. The study included 80 respondents with diabetes, who were divided into 3 parts depending on their physical activity level by IPAQ questionnaire. 27.5% (n=22) patients had low physical activity, 38.8% (n=31) moderate and 33.8% (n=27) had high - intense physical activity in the last 7 days. The

mean HbA1c level for all patients was 6.6 (SD \pm 1.46), lowest HbA1c was 4.70, the highest – 13.00. The mean HbA1c in group with low physical activities was 6.55 ($p=0.446$), in group with moderate physical activities 6.75 ($p=0.885$) and mean HbA1c in group with high-intense physical activities was 6.44 ($p=0.176$).

All respondents on average were sitting 4.9 h in day ($p<0.001$), in group with low physical activities 5.9h, in group with moderate physical activities 5.6h, in group with high-intense physical activities 3.3h.

Conclusion. The results show that respondents who were in the group with low physical activity had higher HbA1c level – 6.55, but respondents who were in group with high-intense physical activities HbA1c were lower – 6.44. This regularity is not found in the group with moderate physical activities, HbA1c level in this group is the highest – 6.75.

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THERAPEUTIC EXERCISE FOR SENIORS TO IMPROVE BALANCE AND REDUCE THE RISK OF FALLS

Key words: seniors, risk of falls, therapeutic exercise

Background. Older people make up a large and growing part of Europe's population. The risk of falls increases extend with age, which are a major cause of injury, disability and premature death in the elderly. Promoting physical activity for seniors and an effective therapeutic exercise programme to improve balance reduces the risk of falls, allows safer movement and activates lifestyle (Kisser, Rogmans & Tumer, 2012; Mcdermott & Memitz, 2006).

Methods. In the autumn of 2020 a scientifically based therapeutic exercise programme for seniors was developed to improve balance and reduce the risk of falls. To determine the impact of the programme a field study was conducted involving ten seniors (women) aged 60 to 70 years. Prior to the study, the health status of each participant was assessed and permission was given to exercise. In order to assess the risk of seniors falling on a daily basis, a questionnaire was conducted at the beginning of the study. A functional evaluation was then performed and a therapeutic exercise plan has been drawn up. The exercise took place two to three times a week for a month. The duration of one exercise session was 45 minutes. Evaluation was performed for the second time at the end of study

Results. The results of the survey show that seven out of ten participants have a fear of falling. Three older seniors have an increased risk of falls. Several seniors have difficulty moving up the stairs, some feel insecure while walking and need support to get up, one has fallen in the last 6 month. Romberg's test was used to diagnose sensible imbalances which were low at baseline, but after therapeutic exercise became higher and reached the norm for some seniors. The Timed Up and Go test scores have improved significantly after the course of therapeutic exercise.

Conclusion. The study confirms that therapeutic exercise, including balance training, is effective in improving balance and preventing falls in older women.

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TOXIC BRAIN LESIONS AND THEIR RADIOLOGICAL FINDINGS

Key words: neuroimaging, CT, MRI, toxic brain lesions, alcohol, drugs, psycholeptic substances

Introduction. Central nervous system is the site of primary exposure to alcohol, drugs and psycholeptics, Brain is a target organ for these toxic substances. Toxic substances can cause structural and functional changes in the brain. Structural changes caused by toxic substances can be assessed using CT (Computed Tomography) and MRI (Magnetic Resonance Imaging).

Aim. Purpose of study was to access and analyze radiological signs of acute and subacute toxic brain lesions in patients exposed to toxic substances using CT and MRI.

Materials and methods. Retrospectively medical records, head CT and MRI of 687 patients, 516 (75,11%) men and 171 (24,89%) women, mean age 45, with acute toxic injury (ICD-10 T40, T51-T52, T58) admitted and treated in Intensive care unit (ICU) of Riga East Clinical University Hospital during the period between Jan 1, 2018 and Dec 31. Clinical parameters were analyzed statistically in correlation to imaging data. Significance: $p < 0.05$.

Results. Among 687 patients most common etiological cause of intoxication was alcohol 61.73% ($n=542$), opioids were the most prevalent drug, detected in 38.36% ($n=28$), psycholeptics – 7.40% ($n=65$). 413 patients (60.12%) had head CT, 8 (1.16%) had both head CT and MRI, 6 patients had only brain MRI. Positive CT findings were found in 42.61% ($n=176$), positive MRI in 100% ($n=14$). Following acute brain injury signs were established on head CT: cortical-subcortical encephalomalacia – 25, lacunar infarctions – 14, basal ganglia lesions – 7, cerebral edema (loss of white-gray matter interface and/or cortical edema) – 6, brain stem stroke – 1. Chronic brain lesions signs on CT were cerebral atrophic changes – 95, cerebellar atrophy – 5. Brain lesions found on MRI: basal ganglia, insular, hippocampus, frontal and parietal cortex acute and global brain hypoxic lesions – 6, global brain atrophy – 2, cerebellar atrophy – 2. Affected basal ganglia were nucleus caudatus, nucleus lentiformis un thalamus, globus pallidus, hypothalamus, putamen – 4, cerebral microhemorrhages – 3, PRES – 1.

Conclusion. MRI is the most sensitive and informative method for the detection and characterization of acute and subacute toxic brain damage.

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VIEWS OF CAREGIVERS AND CARE RECEIVERS ON COMPETENCIES REQUIRED FOR INFORMAL CAREGIVERS IN CARE FOR PEOPLE WITH NEUROMUSCULAR DISEASES

Key words: informal care, competencies, qualitative research

Background: Informal caregivers should have particular knowledge, skills, and attitude to be able to provide the best possible care. There is little information about the knowledge and skills required for informal caregivers to be able to provide care. The main goal of this study was to find out social constructions of competencies required for informal caregivers by analyzing the experience of informal caregivers and care receivers about the process of informal care.

Materials and methods: The study has been conducted by applying qualitative research methods, the approach of social constructionism. The purposive convenience (from the list of the members of the association for people with special needs) and snowball sampling methods were used for selected participants of the study. The number of participants of the study was 10, among them 6 informal caregivers and 4 care receivers. The information on experience, views, and opinions of informal caregivers and care receivers concerning caring competencies were obtained during semi-structured interviews.

Results: As a result of coding the content of the interviews, four main concepts characterizing the competence of informal caregivers were revealed: knowledge, skills, attitude, development. The most important categories of competence were identified then described and analyzed. The following categories were identified as the most significant common categories: knowledge about the disease, knowledge about functional capabilities of the care receiver, physical skills, respectful attitude, and individual approach. Additionally, several distinctive categories were defined and characterized. Informal caregivers singled out the ability to listen attentively and comprehend as an essential part of communication, while care receivers stressed the ability to convey information properly.

Conclusions: Activities executed within the daily care process serve as a factor influencing the social construction of caregivers' and care receivers' competence. Informal caregivers expressed the need to gain practical skills related to ensuring basic needs for those who cannot take care of themselves, whereas, care receivers believe that specialists in the field of formal care should train informal caregivers in the usage of technical aids for the facilitation of daily routine and care.

VĒSTURE UN KULTŪRAS VĒSTURE

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HISTORY AND HISTORY OF CULTURE

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DAUGAVPILS GETO HISTORIOGRĀFIJA

Atslēgvārdi: Daugavpils, geto, historioigrāfija, grāmatas, atmiņas, upuri

Трагедии Даугавпилсского гетто посвящён ряд воспоминаний. Их можно условно разделить на несколько групп по времени и месту публикации.

Западная историография Даугавпилсского гетто представлены воспоминаниями его бывших узников, опубликованными в США, Германии, Израиле. Время их публикаций с 1947 г. по середины 1970-х гг. Мемуары или воспоминания имеют определённую специфику. Это рефлексия, реакция людей на пережитое. Авторы находились в центре описываемых событий. Это воспоминания, людей переживших трагедию, не содержали научного аппарата. В 1990-х – 2000-х гг. работы бывших узников получили «вторую» жизнь. Их перевели на русский язык, Они снабжены ссылками и комментариями, на них написаны рецензии, они введены в научный оборот. Это говорит, что воспоминания актуальны и в наше время, даже после 50 лет с момента публикации.

Советская историография представлена лишь несколькими работами, опубликованными до перестройки. Такие исследования не поощрялись, а их авторы подвергались давлению со стороны «компетентных» органов.

Латвийская историография Даугавпилсского гетто родилась благодаря работе Президентской комиссия историков Латвии, которая опубликовала ряд научных работ. В работе комиссии принимали участие, как латвийские, так и западные историки, краеведы. Удалось получить ответ на фундаментальный ответ: «Кто виноват?». Исследователи пришли к мнению, что если бы не было нацистской оккупации, не было бы и Холокоста.

Совокупность всех этих работ являются предметом исследования.

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DEVELOPMENT OF MARITIME TRANSPORT IN THE REPUBLIC OF LATVIA (1920–1929)

Key words: maritime transport, shipowners, shipbuilding, steamers

Maritime affairs in the territory of Latvia have a long and significant history, they formed the basis for the revival of the Latvian people in the 19th century. Proclaiming the Republic of Latvia in 1918, the establishment of the national economy began. Maritime transport gained an important place. Until the beginning of the global economic crisis, Latvia managed to establish a significant transport fleet with the capital of private shipowners. The history of maritime transport in the interwar period has not been sufficiently studied. The research is based on archive materials, methodological document analysis method, statistical method, biographical method have been used.

M. Bule

HERCS FRANKS – VIENS NO PAZĪSTAMĀKAJIEM LUDZAS EBREJU KOPIENAS PĀRSTĀVJIEM

1926. gada 17. janvārī Ludzā dzimis pasauleslavenais kinorežisors, viens no latviešu poētiskā dokumentālā kino tradīcijas radītājiem Hercs (Hercels, kā rakstīts pasē) Franks. Viņš ir jaunākais dēls Vulfa un Rozas Franku ģimenē. Bērnībā ieguvis tradicionālo ebreju izglītību, apguvis ivritu, bet vēlāk turpināja mācības latviešu ģimnāzijā. „Ludzā es iemācījos visu, kas man noderēja, izejot lielajā dzīvē. Gan valodas – mājās es runāju idišā, skolā es runāju senebreju valodā, pagalmā – krieviski un latviski, gan profesiju – mans tēvs bija lielisks fotogrāfs un, kā saka, arī man šo prasmī atstāja mantojumā...” – bija teicis H. Franks un turpināja „Mammas nāve, evakuācija, divas māsas 1944. gadā pazuda Šuthofas koncentrācijas nometnē. Trešā māsa par mēģinājumu pēc kara aizbraukt uz Izraēlu nosēdēja desmit gadus Gulagā. Brālis frontē tika smagi ievainots un tikai es viens izrādījos dzimis laimes kreklīnā. *Skumjais laimes bērns...*”.

1947. gadā Hercs Franks absolvēja Urāla militārā apgabala Kamišlovas militāro kājnieku skolu, pēc tam – Vissavienības neklātienes juridiskā institūta Sverdlovskas filiāli. Laika posmā no 1952. līdz 1954. gadam viņš strādāja par korespondentu un fotogrāfu Vladimirā, bet vēlāk, pābraucot uz Rīgu, turpināja darbu ierastajās profesijās: sadarbojās ar laikrakstiem „Padomju Jaunatne” un „Rīgas Balss”. Kopš 1959. gada strādāja kā scenārists un režisors Rīgas kinostudijā.

H. Franks bija divkārtējs Latvijas PSR Valsts prēmijas laureāts, LPSR Nopelniem bagātais mākslas darbinieks, Eiropas kinoakadēmijas akadēmiķis, Krievijas Kinoakadēmijas balvas „NIKA” ieguvējs, Latvijas Kultūras akadēmijas goda doktors, Kultūrkapitāla fonda mūža stipendiāts, Latvijas Nacionālā filmu festivāla Lielais Kristaps atzinības ieguvējs. 2011. gada 4. maijā H. Franku iecēla par Triju Zvaigžņu ordeņa komandieri. Apbalvojums piešķirts par mūža ieguldījumu kinomākslā, Latvijas dokumentālā kino skolas izveidē, tās starptautiskās atpazīstamības veicināšanā. 2012. gadā H. Frankam tika pasniegta Ludzas novada Goda pilsoņa zīme. Miris 2013. gada 3. martā.

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INFORMATIVE POTENTIAL OF LIFE STORIES

I find it extremely important to share my ideas about using the capacity of the existing treasury: the collection of recorded life stories created by researchers and students of Daugavpils University and kept in the Oral centre. Its informative potential should be revealed, the scientific significance of represented materials should be imagined by every researcher. There can co-exist two main approaches to using life stories in research. The first one supposes that a researcher has an idea therefore he looks for people who have witnessed the historical event of interest, records their life stories himself according to his own plan. The second idea is that a researcher uses life stories already recorded by someone else to choose the information necessary for his own research. What is the difference between the two kinds of obtained information? How reliable are they? Can there be any unexpected discoveries? How powerful could their influence be? A few successful examples of dealing with else's information are given as well.

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MĪTS PAR 11 VALMIERAS KOMJAUNIEŠIEM – VAROŅIEM PADOMJU VĒSTURES NARATĪVĀ

PSRS vēstures zinātne vienmēr ir bijis politikas instruments, kur viens no centrālajiem elementiem bija mīti. Totalitārajā valstī mīti tika izmantoti ideoloģijas interesēs, kur tiem bija atvēlēta īpaša loma saskaņā ar vēstures nozīmi un jēgu, ko ietekmēja politiskā situācija valstī. PSRS bija raksturīgi mitoloģizēt un heroizēt dažādas personas; šādas tendences bija universālas – katrā republikā, katrā tās reģionā bija savi varoņi, kuru stāsts un tā mācība bija jāzin ikvienam.

Viens no mītiem, kas tika konstruēts un kultivēts LPSR bija mīts par 11 Valmieras komjauniešiem – varoņiem. Tā sauktie Valmieras komjaunieši 1919. gada 14. decembrī sanāca uz vietējās organizācijas konferenci Valmieras tuvumā esošajā Kokmuižas (mūsdienās Kocēnu) kapsētā. Par to bija uzzinājuši Valmieras apriņķa un komendantūras darbinieki, kā rezultātā sanāksmes norises vietu ielenca policijas darbinieki un tika apcietināti 29 cilvēki, kuru vidū bija vairākas nozīmīgas komunistiskās pagrīdes personas. Lauka kara tiesa 11 no 29 apcietinātajiem piesprieda nāvessodu.

Līdz ar Latvijas okupāciju un inkorporāciju PSRS 1940. gadā šis notikums tika aktualizēts – tika konstruēts varoņu mīts, kas 11 komjauniešus pārvērta politiski un emocionāli nozīmīgos vēstures simbolos.

Referātā, balstoties uz LPSR periodiku, tiks analizētas mīta par 11 Valmieras komjauniešiem – varoņiem raksturīgākās iezīmes un tā piemiņa LPSR. Ar jēdzienu *piemiņa* tiek saprasta stratēģija un tās īstenošana, ar kuru šo notikumu atcerējās un uztvēra sabiedrība.

Referāta tēma ir būtiska un zinātniski aktuāla vairākos aspektos: (1) mīta analīze ļauj pilnveidot priekšstatus par vēstures politizāciju LPSR; (2) tiek veicināta izpratne par mītu lomu sabiedrības lojalitātes veicināšanā pret valsti; (3) mīta piemiņas analīze ļauj izprast mērķtiecīgi veidotās stratēģijas un to īstenošanu, ar kuru starpniecību šo notikumu atcerējās un uztvēra sabiedrība.

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RECONSTRUCTION OF THE HISTORICAL PERIOD IN A SPACE LIMITED ENVIRONMENT

Any reconstruction distant in time and space is an abstraction and a mental construction detached from reality, which cannot be identified with true ontological reality, unless it is a thing-in-itself.

Any scholastic, cybernetic rules for the process of historical research are inapplicable. Namely, in each situation, formal constructions are applicable insofar as the objective reality created by living people with all the qualities of their will and the possibility of mistakes allows. Investigative work involves two types of evidence, evidence of fact and evidence of an act of will. They both have an equal role in the investigation. Any court judgment is, by its very nature, an abstraction that strives for the ideal “Saturated Description” described by Clifford Geertz but never achieves it. This process has a meaningful content, although the result achieved is a generalization in which the actors involved acknowledge the sufficient presence of the essential elements. Also, historian’s research process forms a certain belief, in which such narrow studies of specific objects or situations are essential, those can both confirm the researcher’s beliefs and can be the basis for a change of belief. Researcher who has found an indication of a historical phenomenon in one local case has no choice but to unravel the chain of evidence from that one fixed case, very often case with sensitive content.

Sensitive research like related to fate of Baltic Germans is easier to do locally, for example, in just the region of Latgale. They form an elusive element of thinking called personal experience, which is the most important thing that any expert has.

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RIGHTS OF THE LATGALE REAGION SELF-GOVERNMENT IN THE PROCESS OF DEBATING THE PART TWO OF CONSTITUTION (SATVERSME) IN 1922, AS DEPICTED IN THE HISTORICAL SOURCES

The Constitutional Assembly (Satversmes sapulce), the first Latvian parliament elected in democratic elections, commenced its operation in 1920 up until its powers were handed over to the first Saeima, parliament of the Republic of Latvia.

The Constitutional assembly was elected for the purpose of drafting and adopting the Latvian Constitution. By the Second part of *Satversme*, the Latvian Constitution, the authors endeavoured to regulate the legal relationship between the state and its citizens. The majority of political parties and deputies representing Latgale, wanted to ensure that the Latgale region would enjoy a rather wide spectrum of selfgovernance rights stemming from the clauses and decisions included in the resolution of the Latgale congress of 1917 by including the respective regulation in the Section 99 of the Part two of *Satversme* addressing the autonomous rights of towns, villages and rural entities. However, the majority of the Constitutional Assembly voted against the mentioned proposal and rights of the Latgale region were left out of *Satversme*.

Transcripts of the Constitutional Assembly sessions allow reconstructing the mentioned historical events as well as permit studying the course of debating, voting results, as well as the consequences of the decisions taken. The mentioned historical events are also depicted in the Latgalian press of the time. Different types of media would publish various information and express diverging views about the event. In the research paper the author gives a brief overview about the political stance of the Constitutional Assembly regarding the issue of enshrining the rights of the Latgale region.

The paper fits into the context of the regional studies. The mentioned subject-matter has not been extensively studied and the main sources of research are the Latgalian press, titles like "Latgalīts", "Jauno Straume", "Latgolas Vords", as well as transcripts of the Constitutional Assembly of Latvia.

The author is aiming to broaden the perception regarding the political debate taking place during the sessions of the Constitutional Assembly. Also, to aid the readers, the author has compiled a glossary of the Latgalian language terms as used in the press.

The author deploys the source research method as well as compares reliability of the different sources of information. Within the limits of the source research method, a linguistic interpretation method is also used.

The issue of the Latgale regional status reemerges every now and then, and points to the inadequacy of the regulation and definition of the status of the region. Thus, the issue that was left unresolved a century ago has retained its topicality throughout the years.

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SĒLIJAS NACIONĀLO PARTIZĀNU APĢĒRBS UN BRUŅOJUMS

Nacionālo partizānu pretestība balstīta uz daudzpusīgu pārskatu par 130 aplūkotajiem mežabrāļiem un to vēsturiskiem notikumiem, kas raksturojas ar viņu vardarbīgu pretestību okupācijas varai Latvijā – Sēlijas kultūrvēsturiskās telpas Aknīstes, Biržu, Elkšņu, Gārsenes, Saukas, Susējas un Viesītes pagastu apkārtnēs, laika posmā no 1944–1952. gadam. Nacionālajiem partizāniem nebija vienotas uniformas, jo arī maskēšanās nolūkā tā bija bīstama. Apģērbu nacionālajiem partizāniem nācās gādāt pašiem, līdzīgi kā Latvijas brīvības cīņās apgāde notika pašiniciatīvas ceļā un bez jebkādas sistēmas. Nacionālie partizāni izmantoja vācu armijas formastērpus, kas bija kalpojuši pildot dienestu, vēlāk dezertējot no vācu karaspēka vienībām tie iesākumā netika novilkti. Tomēr lielākā daļa bija tērpta civilapģērbā-mēteļos, tumši pelēka auduma jakās un biksēs, austos linu kreklos, galvās bija pelēkas

krāsas civilās un salmu cepures, kājās dažāda tipa zābaki un pat vīzes. Galvenais apģērbs bija jābūt siltam, piemērotam ilgstošai dzīvei āra apstākļos. Īpašs partizānu apģērba veids bija maskēšanās tērpi un sieviešu drānas. Ziemas apstākļos partizāni izmantoja baltus maskēšanās tērpus, kas kaujas apstākļos dažkārt tiem palīdzēja iziet no aplenkuma. Savukārt sieviešu apģērbs ļāva tiem maskēties un palīdzēt atbalstītājiem lauku darbos. Veicot pretpadomju akcijas mežabrāļi izmantoja arī sarkanarmiešu formastērpus. Tāpat rekvizētās preces tika pārdotas un iegūtā nauda kalpoja preču un apģērba iegādei. Sēlijas nacionālo partizānu aplūkoto apkārtnu bruņojums laika posmā no 1944.-1952. gadam pārsvarā bija vācu K98 Mausera sistēmas šautenes 32%, otrais izplatītākais ierocis bija padomju sistēmas PPŠ41 mašinpistole – 11%, trešais padomju armijas pusautomātiskā šautene SVT40 un Mosina sistēmas šautenes pa 7% no katras markas. Kopumā vācu armijas sistēmas bruņojums sasniedza 49% no kopējā bruņojuma skaita, padomju sistēmas izcelsmes bruņojums – 38% citu valstu sistēmas – 10%, nezināmas izcelsmes – 3%. Bruņojumā bija arī granātas, gan vācu, gan padomju sistēmas ražojuma. Pētījumā ir parādītas detaļas, kas bija raksturīgas Sēlijas nacionālo partizānu apģērbā, bruņojumā un to sagādē, pielietota interpretācija ar vizuālo informāciju.

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THE RESEARCH PROJECT “HOLOCAUST DISCOURSES AND MEMORY INFRASTRUCTURE IN LATVIA”

The paper introduces the research project “Holocaust Discourses and Memory Infrastructure in Latvia”. The research project focuses on discursive constructions of memory of the Holocaust in Latvia. The relevant policies, representations, memory networks, and attitudes of the population will be studied empirically to draw a conceptual model of the formation of Holocaust Memory analyzing transnational, regional, national, and local perspectives, foundations, and interrelations.

The project proposal has two major goals: (1) to obtain comparative data about the discursive constructions of the Holocaust in Latvia, making use of both individual and collective methodologies in order to implement a theoretical and conceptual explanation of the aftermath of the Holocaust as a social, political and cultural practice and a network of power relations; (2) to inform and educate about the Holocaust in Latvia: its history, as well as the implications of the tragedy on policies, education, and ethics in order to foster the commemoration and creation of the memory infrastructure that entails the moral remembering of the genocide.

The project proposal is developed around three work packages. Each work package includes phases of literature studies, data collection, data analyses, data interpretation, writing, dissemination, submission for publication, two scientific presentations, dissemination by public events, and on social media.

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THE ROLE OF THE FRIENDS OF SCIENCE SOCIETY IN VILNIUS IN THE DEVELOPMENT OF BOTANICAL STUDIES DURING THE NON-INSTITUTIONAL AND INTERWAR PERIODS

The Friends of Science Society in Vilnius was a scientific organization, which was active in Vilnius from 1907 to 1939. Although Society’s activities were mainly aimed at preserving the Polish cultural heritage in Lithuania, its cultural contribution consisting of amassed extensive museum collections and those of written heritage (books, periodicals, historical documents, etc.) is highly valued nowadays. One of the tasks undertaken and performed by the Society was to propagate scientific knowledge and thus to contribute to the development of scientific thought at the time when in the whole territory of the present-day Lithuania there were no scientific institutions, i.e. in the 1907-1919

period, and later, concurrently with the operation of Stephen Bathory University during the interwar period. Regional nature studies were also within the scope of Society's interests. It is through the efforts of its members that the faunal and floral data dating back to the beginning of the 20th century are available at present. At present the Society's botanical heritage consists of herbarium collections; published books "Zapiski bryologiczne" (Bryological Inscriptions) by Kazimierz Szafnagel (1908) and "Historja i bibliografja: Cz.1" (History and Bibliography: Part 1) by Witold Sławiński (1922); and dozens of papers on the distribution of plants, anatomy, physiology, history of botany published in the Society's periodicals.

The purpose of this presentation is to overview the botanical work performed by members of the Friends of Science Society in Vilnius, i.e., to list the most outstanding members, who took care of botanical collections, organized botanical presentations, published botanical data, as well as to discuss the scientific and cultural significance of the botanical works, which were published with Society's support.

This project has received funding from the Research Council of Lithuania (LMTLT), agreement No S-LIP-19-62.

Mikus Žagata

VIDZEMES PROVINCES GARNIZONU UN KARASPĒKA FINANSĒŠANAS PROBLEMĀTIKA 1700. GADA RUDENĪ - 1701. GADA PIRMAJĀ PUSĒ

Lielais Ziemeļu karš no reģionālas perspektīvas līdz šim latviešu historiogrāfijā ir maz pētīts. Lai gan sabiedrībā ir interese par šo periodu, tomēr zīmīgāku ieguldījumu perioda pētniecībā ir snieguši tikai Edgars Dunsdorfs un Mārīte Jakovļeva. Jāatzīmē, ka šobrīd historiogrāfijā aktīvi tiek pārvērtēti arī dažādi par šo periodu 20. gs. gaitā radītie mīti. Turklāt – 2021. gadā aprit 300 gadi kopš oficiālā Lielā Ziemeļu kara miera līguma Ništatē noslēgšanas un Vidzemes pāriešanas Krievijas caristes īpašumā. Atzīmējot šo vēstures pagrieziena punktu, būtu svarīgi izprast notikumus, kas noveda pie šādā iznākuma.

Pētījums ir balstīts uz Latvijas historiogrāfijā līdz šim maz izmantoto Latvijas Valsts vēstures arhīvā glabāto Vidzemes zviedru Ģenerālgubernatora kancelejas fondu un tā sastāvā esošajām lietām no Vidzemes ģenerālgubernatora Ērika Dālberga sarakstes.

Pētījuma mērķis bija atklāt zviedru Vidzemes provinces garnizonu un karaspēka finansēšanas problemātiku 1700. gada rudenī – 1701. gada pirmajā pusē. Noskaidrot finansējuma iegūšanas avotus un veidus, finansējuma izmantošanas jomas, kā arī faktisko garnizonu apgādes finansu stāvokli apskatāmajā periodā.

Pētījuma gaitā tika noskaidrots, ka 1700. gada nogalē Vidzemei bija jānodrošina jaunu armijas vienību izveidošana, jāuztur provincē dislocētā Zviedrijas karaļa Kārļa XII armija, jāgatavo resursi 1701. gada armijas kampaņai u.c. Vidzemes provinces administrācija saskārās ar milzīgām finanšu problēmām, jo plaukstošā provinces tirdzniecība kara dēļ bija pārtraukta, bet daļa provinces bija kara izpostīta. Risinājums tika meklēts veicot vekseļu darījumus un ieķīlājot valsts muižas, bet finanšu problēmas ar to neizdevās atrisināt. Vēl vairāk, provinces administrācija sāka zaudēt uzticību naudas aizdevēju acīs, jo laikus neizdevās apstiprināt noslēgtos līgumus. Vidzemes garnizonu kareivjiem netika izmaksātas algas un garnizonu komandieri sūdzējās gan Vidzemes ģenerālgubernatoram, gan Zviedrijas karalim.

TIESĪBU ZINĀTNE

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LAW

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AN EU PERSPECTIVE ON THE EMPLOYEE'S RIGHT TO DISCONNECT

An increase in telework and digital resources being used for work purposes has resulted in work-life disbalance in the EU member states. The right to disconnect refers to an employee's right to be able to disconnect from work and refrain from engaging in work-related electronic communication during non-working hours, like emails and other messages. If the "rights to disconnect" are not explicitly regulated, the risk of disbalance between work and private life is at stake. EU law does not directly determine the right to disconnect from digital devices, however, such rights arise from certain legal norms, for example, Working Time Directive. It is also recently discussed at EU Parliament that EU countries must ensure that workers can exercise the right to disconnect effectively. That means that discussion is no longer if there is a need to implement the "right to disconnect" in national legal acts, but how to implement the right efficiently not only at a national level but at the EU level as well.

The goal of the research is to provide an in-depth analysis of the legal status of the "right to disconnect" in the European Union and its member states. To reach the goal, the author is using various scientific research methods. The paper is based on an analytical, comparative, case law analysis method to provide valid conclusions on the current role of the "right to disconnect" in EU legislation and offer recommendations on how to implement the "right to disconnect" efficiently to avoid violation of employees' rights.

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CONSECUTIVE PARTIAL ACTIONS IN CIVIL PROCEEDINGS UNDER THE GENERAL PRINCIPLES OF LAW

In the European Union potential litigants have wide discretion about how to enforce their rights. This flexibility could be used to address the problem of inefficient, lengthy legal procedures. Using the example of Latvia, this paper will argue that partial actions – in other words, claims for the recognition of a part of a claimant's rights, with further claims following later – could allow claimants to settle certain claims more quickly and less expensively than a conventional procedure where the whole claim is dealt with at once. It will argue that such a partial action procedure is provided for by existing legal principles, and that no changes to Latvian legislation are required to use it.

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ELEKTRONISKIE PIERĀDĪJUMI: EVOLŪCIJA VAI REVOLŪCIJA

Mūsdienās tehnoloģiju veicinātās pārmaiņas izveidoja tādas telpiskas attiecības, kur fiziskā un digitālā pasaule nemanāmi saplūda vienā veselumā. Pēc būtības tiek piedzīvots jauns cilvēces eksistences veids (digitalizācija), kas prasa vienotu pieeju sabiedrisko attiecību noregulējumā. Izaicinājumu priekšā arī tiesībsargājošo iestāžu darbs, jo arvien biežāk personas noziegumus izdara digitālajā vidē, un cīņā ar šiem noziegumiem nav piemērojamas līdzšinējās metodes. Tehnoloģiskais progress veicinājis arī pierādījumu izpratnes pamata maiņu. Kriminālprocesa likuma 136. pants noteic, ka par pierādījumu kriminālprocesā var būt ziņas par faktiem elektroniskas informācijas formā, kas apstrādāta, uzglabāta vai pārraidīta ar automatizētas datu apstrādes ierīcēm vai sistēmām. Rakstā uzmanība tiks koncentrēta elektronisko pierādījumu jēdzienam un vietai pierādījumu sistēmā.

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HISTORICAL DEVELOPMENT OF THE CISG

The interpretation of the United Nations Convention on Contracts for the International Sale of Goods (CISG) is stated by its Article 7 (1), which requires us, law interpreters, to interpret it uniformly within every CISG country. Although the CISG does not say anything about on how to reach this uniformity, there is no formal implementing body of the CSIG, the well know recognized academics in international sales law (amongst them a few drafters of the CISG) have “agreed” on certain persuasion.

In order not to danger the aim of uniform interpretation, when certain rules of the CISG are analysed it is necessary to read the academic writings and to analyse so called “*travaux préparatoires*” (the legislative history of the CISG). Therefore, it is necessary to look at the historical development of the CISG.

The aim of this study is to examine the preconditions for the emergence of the CISG, to study the legal norms in international trade existing before the adoption of the CISG.

In order to achieve this aim, the author analyses the texts of UNCITRAL Yearbooks, the Official Records of the Vienna Conference, and as well academic writings on related issues. The author also considers how, for instance ULIS (Convention relating to a Uniform Law on the International Sale of Goods), and others pre-existing international rules affected the content of the CISG and whether the relevant norms of ULIS contributes to a common understanding of the CISG norms.

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IMMOVABLE PROPERTY'S ASSESSMENT VALIDITY PERIOD IN CASE OF FORCED EXECUTION

Key words: *immovable property, immovable property's assessment, enforcement*

In the legislation of the Republic of Latvia, the term of validity of the valuation of immovable property has not been regulated. I have to point out that in practice specific certified immovable property evaluators indicates by themselves the term of relevant valuation, even though the legislation do not impose to indicate term.

The author researchs the topic validity term of immovable property's valuation in forced execution when the assessment is demanded by the Bailiff performing its duties - levying execution to the one's immovable property, according to First paragraph of Article 604 of the Code of Civil Procedure, that

immovable property is being valued by certified evaluator by the request of Sworn bailiff at the expense of debtor, defining property's value in forced sale.

In this research, the author analyzes most frequent problem situations, making systematic analysis by comparing legal framework of Republic of Latvia in conjunction with foreign available legislation and other useful information that results with solutions that is in debt collectors and debtors interest – to make the higher most possible satisfaction on claim from sales of specific immovable property and also to avoid the disputes about auction entry level price mismatch with real market value, because at this moment validity assesment does not lay down any limitation period.

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INADMISSIBILITY TO IDENTIFY ADVOCATE WITH HIS CLIENT

Currently the question of prevention of money laundering and terrorism and proliferation financing, the problematics of its current implementation and maximal transparency has been identified as top priority on the governmental level in Latvia and prevails over the question of advocate's immunity. At the same time, it is important to note that transparency often conflicts with question about person's rights to privacy and privacy protection aspects that are one of the fundamental rights enshrined in the European convention for protection of human rights and fundamental freedoms.

Advocate's profession has a specific character and in comparison with other legal professions, it has certain legal privileges in the execution of professional duties. At the same time, it can be admitted that these privileges can be looked upon as the two sides of a medal, from one side, as an advocate's privilege, from the other – as the burden of an advocate with reference to his chosen profession, client and society interests on the whole.

Advocate plays a significant role in securing the mission of justice and legal order in the judiciary system and in the context of the implementation of the fundamental rights of the society. There are three fundamental principles of advocate's professional activity that support this special professional status, namely: 1) independence, 2) loyalty and 3) personal fairness.

Widening the scope of legal entities with the adoption of a new legislative framework, the differences that characterize the profession of a lawyer and that of an advocate, their professional activity, have to be taken into consideration. The limiting measures are to be applied accordingly by respecting the prohibition clearly set out in the Advocacy law of the Republic of Latvia – to identify advocate with this client. The said prohibitions can be widened towards the prohibition to identify advocate's activity with that of client.

Not being aware of characteristic specific traits that adhere to advocate's profession, forming the basis of concepts of advocate's identity and immunity, and adopting a new legislative framework, actually an intervention takes place with reference to the spheres of impact and enforcement. Influencing those two principles in turn, it is not possible to implement advocate's mission – to serve as an instrument in securing the justice in the judiciary system, executing the third component of the division of powers. Conclusion can be made from the above mentioned statement that risk arises to break the fragile red lines that secure the implementation of justice.

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LEGAL FRAMEWORK FOR THE ENFORCEMENT OF JUDGMENTS ON THE EXERCISE OF CROSS-BORDER ACCESS RIGHTS

On 25 June 2019 European Council adopted Council Regulation (EU) 2019/1111 on jurisdiction, the recognition and enforcement of decisions in matrimonial matters and the matters of parental responsibility, and on international child abduction (Brussels II ter Regulation). The new Regulation is a revision of the so-called Brussels IIbis Regulation. One of the main objectives of the revised regulation is to improve the current EU rules that protect children in cases of cross-border parental responsibility disputes, such as those related to custody, access rights and child abduction.

Decisions regarding access rights are different from decisions in most other civil and commercial matters. These decisions do not relate to money or inanimate objects, they apply to children. Regarding children we should be particularly sensitive. Children grow and develop, their circumstances change, they have their own views. Decisions cannot be applied to children as if they were goods or money. Enforcing decisions relating to children, especially in cross border cases, can be incredibly difficult. At the same time everyone must keep in mind that wasting time in cases that affect the rights of a child is unacceptable and contrary to the child's interests to know their parents, to maintain meaningful and direct contact with them.

This paper analyses the differences between Brussels II ter Regulation and Brussels IIbis Regulation in regulating the enforcement procedure of cross borders decisions relating to access rights. The study stresses the possible problems of rapid and effective enforcement of judgments relating to access rights in case law. It also points out that the court often plays a substantial role in the actual process of enforcement of the access rights decisions, e.g. Article 54 of Brussels II ter Regulation permit the courts of a Member State of enforcement to decide on practical arrangements for organizing the exercise of rights of access, if the necessary arrangements have not or have not sufficiently been made in the decision given by the courts of the Member State having jurisdiction. Finally, this article intends to analyse the rules provided in Brussels II ter Regulation on suspension of enforcement proceedings and refusal of enforcement of access rights judgements.

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LEGAL REGULATION OF ELECTRONIC SIGNATURE IN LATVIA

Key words: *electronic signature, advanced electronic signature, qualified electronic signature, electronic document, handwritten signature*

During the last 15 years, Latvia has made a rapid transition to digital and electronic technologies. Today, it is difficult to imagine an area of activity that would not use electronic documents, electronic communication systems or other modern solutions. The daily use of electronic documents, signing of distance contracts, electronic applications and submission of other digitalized documents has become a new normal. Nevertheless, it implies also risks because in digital environment it is not always possible to verify a person's identity, true intentions or other relevant circumstances, which affect or may affect the expected business arrangements. In the digital environment, it is not possible to sign a document by hand, which has traditionally been the way in which the parties give consent to the transaction, the content of the signed document and its legal consequences. In the digital era, an electronic signature replaces a person's signature. The study will dwell on the legal regulations of electronic signatures in Latvia, its functions, possibilities of use and challenges. By analyzing the legal framework and available case law, the article will focus at the types of electronic signatures, their characteristics and functions.

MANTKĀRĪGĀ NOZIEDZĪBA: KRIMINOLOĢISKAIS SATURS

Mantkārīgā noziedzība kā noziedzības daļa tiek raksturota ar specifisku un sarežģītu nodarījumu kopumu, kas izdarīti mantkārīgu tieksmju dēļ. Sengrieķu zinātnieks un filozofs Aristotelis bija viens no pirmajiem, kurš nodalīja divus kriminālās mantkārības veidus: 1) bagāto mantkārība (tieksmes uz pārmērību; 2) nabadzīgo mantkārība (rodas cilvēka elementāro vajadzību apmierināšanas trūkumā). Turklāt aktualitāti nav zaudējusi zinātnieka norāde uz nozīmīgu kriminogēno fenomenu, kad apjomīgus noziedzīgus nodarījumus paveic bagātnieki, tajā pašā laikā vislielākā uzmanība tiek veltīta nabadzīgo personu izdarītajiem nodarījumiem (*Аристотель. Сочинения: В 4 т. Т. 4. М., 1983*).

Atbalstāms ir viedoklis, ka mantkārīgā noziedzība ir viena no daudzveidīgākajām noziedzības formām, ar dažādu interešu aizskārumu (dažādi noziedzīga nodarījuma objekti) – valsts, sabiedrība, atsevišķu cilvēku grupu vai indivīds.

Jēdziens „mantkārīgā noziedzība” tiek lietots plašākā un šaurākā nozīmē. Mūsdienās mantkārība kā tieksme pēc materiāla labuma, naudas, bagātības vai peļņas vai alkatība pēc naudas, vai pat bagātības sagrābšana ir saistāma ar: 1) vardarbības izmantošanu; 2) ar dienesta stāvokļa izmantošanu vai 3) arī ar bez minēto apstākļu izmantošanas. Plašākā nozīmē – noziedzīgu nodarījumu kopums, kas izdarīti ekonomiska motīvu pamatā: a) apmierināt pamata vajadzības; b) apmierināt nosacītās vajadzības, kas izveidojušās sabiedrības sociāli ekonomiskās diferenciācijas rezultātā; c) sasniegt savu „ideālo” materiālo standartu. Šaurākā nozīmē – noziedzīgu nodarījumu kopums, kas izdarīti mantkārīgu motīvu dēļ ar netaisnīgas iedzīvošanās mērķi.

NECESSITY AND LEGAL FRAMEWORK FOR THE INTERNATIONAL ADOPTION OF CHILDREN

Key words: children, adoption, legal framework

In any country of the world, including Latvia, there are children who live in very difficult conditions and need special care. In the past, this was particularly caused by wars, which led to both human migration and the emergence of orphans. Today, it is due to unequal living conditions across individual families, the high birth rate in poor families, and the need to create better living conditions for children with special needs.

Families living in developed countries, however, are able to provide better care and education to their children, as well as support them during adulthood, while in case a family is childless, it can provide itself with heirs through adoption.

Problems with child adoption are still not fully solved at the international level. Before World War II, the laws of any country did not contain any provisions governing international adoption, and the adoption was governed by the national laws, i.e. very differently. In the countries that had imposed restrictions on adoption by foreigners, the restrictions were circumvented through practicing de facto adoption. In cases in which the citizenship of a child belonging to the category of forcibly displaced persons could not be identified, he or she was adopted as the citizen of the country.

The proposals made by some countries concerning this issue were considered and incorporated into the Convention on the Rights of the Child passed on 20 November 1988 as well as the Hague Convention passed in 1993. However, even more relevant provisions concerning international adoption and custody of children for foster families were incorporated into 1996 directives that were adopted at the 27th World Congress in Hong Kong. Nevertheless, the procedure for international adoption is still not perfect and requires attention, as children are adopted by foreigners having with different traditions and beliefs.

Therefore, the research aims to identify and assess potential solutions to establishing an international order for children adoption in order to protect the rights and personal interests of adopted children living abroad.

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OPEN BANKING AND PSD2

With the Open Banking we understand “open bank data” which means bank provides third party financial service providers with access to client’s data. The second Payment Service Directive established two new payment services that are based on the open banking – payment initiation service and account information service. These two payment services only acquire and provides information related to the client’s bank account information. It means the PSD2 goes beyond the payments. Open Banking gives the financial service providers a more competitive environment which hopefully will result in lower costs and better service within financial services.

As the connection to the bank data is without any agreement between the bank and payment service provider and it means that any payment service can connect to the bank data PSD2 and other legislative documents set strict safety regulations to regulate the Open Banking.

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PAPILLĀRLĪNIJU RAKSTU PĒDU SAGLABĀŠANĀS APKĀRTĒJĀS VIDĒS IETEKMĒ

Papillārlīniju rakstu pēdu saglabāšanos uz miruša cilvēka ādas ietekmē vairāki faktori, kurus savukārt var iedalīt faktoros, kurus mēs varam ietekmēt un kurus mēs nevaram ietekmēt.

Autore savā darbā veica šo faktoru izpēti un analīzi, pētīja šo faktoru ietekmi uz papillārlīniju rakstu pēdu saglabāšanos, izveidojot ietekmējošo faktoru iedalījums. Tika veikts ārvalstu pētījumu apkopojums un analīze.

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PIEVIENTĀS VĒRTĪBAS NODOKĻA KRĀPŠANAS APKAROŠANAS PROBLĒMAS LATVIJĀ SAISTĪBĀ AR GRAUDIEM

Darba mērķis ir izpētīt un analizēt Latvijas tiesu praksi par komersanta iesaistīšanos krāpnieciskās darbībās, ar nolūku gūt fiskālās priekšrocības atskaitāmā nodokļa veidā darījumos, saistībā ar graudiem.

Analizējot Latvijas tiesu praksi, autors konstatēja, ka nodokļu administrācija, veicot nodokļu pārbaudes, pieņem lēmumus neatzīstot nodokļu maksātāja tiesības uz pievienotās vērtības nodokļa atskaitīšanu par graudu iegādes darījumiem. Nodokļu maksātāji minētos darījumus ar tiešajiem darījumu partneriem noslēdz graudu pieņemšanas punktā (elevatoros), proti, tiešie darījumu partneri nogādā graudus graudu pieņemšanas punktā, kur tie tiek nosvērti un laboratoriski pārbaudīti, un pēc tam tiek noformēti dokumenti par to, ka nodokļu maksātājs šos pārbaudītos graudus iegādājas no tiešā darījuma partnera un pēc tam uzreiz pārdod nākamajam darījumu partnerim.

Iepazīstoties ar Augstākās tiesas Administratīvo lietu departamenta judikatūru, autors konstatēja, ka tiesas nodokļu administrācijas lēmumus dažkārt atceļ, izvērtējot un uzklusot nodokļu maksātāja paskaidrojumus un pārbaudot pierādījumus (proti, liecinieku liecības, dokumentus par preču piegādi un pārbaudi, graudu pieņemšanas punktu darbinieku paskaidrojumus par preču ieviešanu graudu pieņemšanas punktā), tādējādi tiesas ieskatā izskaidrojot, ka nodokļu maksātāja kā starpnieka iesaiste ir bijusi pamatota. Proti, tiesas ieskatā, tas, ka prece tiek pirka un pārdota graudu

pieņemšanas punktā, nenozīmē, ka darījumu partneriem obligāti jābūt klāt pie šiem svāriem (elevatoriem), jo graudu svēršanu un laboratorisko pārbaudi veic graudu pieņemšanas punkta darbinieki, kas par graudu kvalitāti un svaru sastāda dokumentus, uz kuru pamata tiek noformēti iegādes un tālāk pārdošanas darījumi. Līdz ar to, nav pamata uzskatīt, ka nodokļu maksātājs šādos darījumos nevarētu piedalīties attālināti. Tiesa ir atzinusi, ka preču pirkšanas un pārdošanas modeli, kas ir ar graudu pieņemšanas punktu iesaisti, kur preces nosver un to kvalitāti pārbauda graudu pieņemšanas punktu darbinieki, preču pircējam un pārdevējam pašam nav obligāti jābūt klāt, lai pārliecinātos par piegādāto preci. Tāpēc arī preču iegādes dokumenti var tikt noformēti (parakstīti) pēc faktiskā darījuma.

Ņemot vērā minēto, autors analizēja tiesu praksi attiecībā uz pievienotās vērtības nodokļa krāpšanas apkarošanas problēmām Latvijā, saistībā ar graudiem.

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SASKARSMES TIESĪBU ĪSTENOŠANA PROBLEMĀTIKA LAIKĀ KAD IR PIEMĒROTS PAGaidu AIZSARDZĪBAS LĪDZEKLIS

2014. gada 31. martā stājās spēkā grozījumi Civilprocesa likumā, kas tika papildināts ar 30.⁵ nodaļu „Pagaidu aizsardzība pret vardarbību” un šo pagaidu aizsardzības līdzekli laika gaitā, kāds no bērnu vecākiem iemācījās izmantot, ka sava veida atriebības līdzekli pret otru vecāku, lūdzot tiesai piemērot pagaidu aizsardzības līdzekli ar mērķi nenodrošināt otra vecāka saskarsmes tiesības ar bērnu, lai gan Civillikuma 181.panta pirmā daļa noteic, ka: „Bērnam ir tiesības uzturēt personiskas attiecības un tiešus kontaktus ar jebkuru no vecākiem” (saskarsmes tiesība) un ceturtā daļa noteic, ka: „Jebkurai personai ir pienākums atturēties no tādām darbībām, kas varētu negatīvi iespaidot bērna attiecības ar kādu no vecākiem.” Bāriņtiesas šī jautājuma risināšanā ar abiem ar bērnu vecākiem iesaistās kūtri, savukārt tiesas pagaidu regulējumu par saskarsmes tiesībām nenosaka, līdz ar to veidojas situācija, ka bērns no vecāka ar kuru saskarsme ir pārtraukta otra vecāka ambīciju dēļ zūd saikne, un tas nav atbilstošs bērna vislabākajām interesēm.

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SEXUAL VIOLENCE AGAINST WOMEN IN SOVIET LITHUANIA: LEGAL THEORY AND PRACTICE

This presentation will explore different forms of gender-based sexual violence against women that existed in Soviet occupied Lithuania in 1940–1941 (the first Soviet occupation) and in 1944–1990 (the second Soviet occupation). The analysis is based, first of all, on Soviet laws and legislation connected to this matter. It will reveal how crimes such as rape and sexual harassment were defined in Soviet legislation and criminological thought. The second part of the presentation is dedicated to the analysis of the legal prosecution of sexual crimes against women. The data used in this analysis is based on: criminal files of convicted people, court documents, interviews, memoirs from former officers of the Soviet criminal prosecution systems and statistical data of crimes (including interviews with victims of these crimes). The presentation will reveal the detected gap between the Soviet legal ideal of dealing with sexual crimes against women and the reality of criminal prosecution – as well as experiences of the victims of sexual crimes.

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THE NEED TO PROMOTE UNIFORMITY - THE CONCEPT AND ITS MEANING

The United Nations Convention on Contracts for the International Sale of Goods (CISG) Article 7 (1) states that in the interpretation of this Convention, regard is to be had to its international character and to the need to promote uniformity in its application and the observance of good faith in international trade. The need to Promote Uniformity in the application of the Convention is one of three principles, which imposes an obligation for CISG interpretation.

The need to promote uniformity in the application of the Convention is one of the key principles enshrined in Article 7 (1). Its essence is closely linked to both the international nature of the CISG and the observance of good faith in international trade. This concept "the need to promote the uniform application of the CISG" imposes a certain obligation or duty to the CISG Member State, to its courts and arbitral tribunal and other law interpreters or practitioners in the interpretation of this Convention.

In this study, the author using analytical, grammatical and theological methods will analyze the meaning of this concept, its interconnection with the other principles included in Article 7 (1) and its implementation in practice.

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TIESĪBU EKONOMISKĀ ANALĪZE VAINAS VĒRTĒŠANĀ PRIVĀTTIESĪBĀS

Privāttiesībās vainas vērtēšana nav precīza zinātne. Gluži otrādi – neuzmanības atzīšana vai noliegšana lielākoties šķiet tīri patvaļīga tiesas izšķiršanās. Tas ne tikai veicina nenoteiktību, bet iedragā arī tiesu autoritāti. Tiesību ekonomiskā analīze uzdrošinās šo problēmu risināt. Tā piedāvā neuzmanību vērtēt ar matemātisku precizitāti, ne tikai novēršot šķietamo tiesu patvaļu, bet pat veicinot sabiedrības kopējo labklājību. Un kaut arī pamazām, bet tomēr no ASV aizgūtā tiesību ekonomiskā analīze kļūst aizvien populārāka arī Eiropā. Tas ir tikai laika jautājums, kad gribot negribot arī mums būs jāprot piemērot tiesību ekonomisko analīzi juridisku jautājumu risināšanā.

Māris Garjānis

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TRANSPORTLĪDZEKĻA VADĪTĀJA VESELĪBAS STĀVOKĻA IETEKME UZ NOZIEDZĪGA NODARĪJUMA SASTĀVU

Kriminālatbildības pamatā ir noziedzīga nodarījuma sastāva konstatēšana personas darbībās vai bezdarbībā. Noziedzīgu nodarījumu izdarīšanā, kas ir vērsti pret ceļu satiksmes drošību un ir paredzēti Krimināllikuma 260. pantā, ir jākostatē krimināltiesību teorijā norādītās noziedzīga nodarījuma sastāva obligātās pazīmes, proti, objekts, objektīvā puse, subjekts, subjektīvā puse. Rakstā autors aplūkos praksē sastopamu problemātiku, kas ir saistīta ar subjektīvās puses konstatēšanu transportlīdzekļa vadītāja darbībās vai bezdarbībā, gadījumos, kad transportlīdzekļa vadītājs, kā alibi, izmanto veselības stāvokļa pasliktināšanos ceļu satiksmes negadījuma brīdī vai tieši pirms tā.

Sigita Černevičiūtė

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VIOLENT CRIMES AGAINST WOMEN IN CRIMINAL LAW OF LITHUANIA IN 1919–1940

Two main groups of legal sources in Lithuania in 1919–1940 must be distinguished: civilian criminal law and special military criminal law. The imperial Russian Criminal Code of 1903 came into force in Lithuania in 1919 and was called Lithuanian Penal Statute. The special Part of the Statute defined serious crimes, their elements, stipulated the punishments. In the same year, the State of emergency was declared and the Special Articles of State Protection that regulated martial law raised punishments for violent crimes against a person for civilians as well as military and gave the power to examine these crime cases in military courts. General violent crimes were described in the Military Criminal Statute, also other special criminal laws. Based on three chapters of Penal Statute of Lithuania: deprivation of life, bodily injury and violence, indecency we will analyse the development of legal concepts of most common types of violent crimes against women in the Interwar Lithuania's criminal law.

Dainis Vēbers

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WHICH WAY TO GO? URGENT PROCEDURES, CONCILIATION OR TERMINATION OF CRIMINAL PROCEEDINGS IN THE CASE OF A MINOR CRIMINAL OFFENSE

The aim of the research is to evaluate the conditions under which it would be more effective to apply urgent procedures in criminal proceedings, direct criminal proceedings for concluding a conciliation or releasing a person from criminal liability in the case of a minor criminal offense.

The research examines both Latvian and foreign legal rules and legal literature. Methods of interpretation of legal norms as well as comparative analysis have been used for the analysis of legal norms.

The amendments to the Criminal Procedure Law and the Law "On the Procedures for the Coming into Force and Application of The Criminal Law", which defined a minor criminal offense, were designed to establish clear criteria for terminating criminal proceedings, although they do not provide a clear vision of minor threats to statutory interests. Furthermore, the conditions for terminating criminal proceedings in the case of a minor criminal offense are disproportionate to the conditions for terminating criminal proceedings in the case of a conciliation. Accordingly, in the case of a minor criminal offense, the precondition for terminating the criminal proceedings would be a criminal offense, which as a result individual under private law have not been harmed or have been compensated for losses.

Into criminal proceedings shall be given priority to the urgent procedures with the possibility to apply the prosecutor's penal order or termination of criminal proceedings with conditions already at the stage of criminal prosecution, providing for the possibility to implement the conciliation in parallel with the urgent procedures. At the beginning of criminal proceedings possibility of conciliation should be considered only if both the victim and the offender have a clear desire to reach a conciliation.

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THE ISSUES OF DEFENDING THE PUBLIC INTEREST IN ADMINISTRATIVE LAW

The aim of this article is to analyse main issues of defending the public interest in administrative law. So, the analysis is based on three main issues. The first one is the definition of public interest and it's specific in administrative law, the second one is the ratio of subjects that can participate in this question. Then the analysis is based on Lithuanian case law in administrative law and the article analyses the ratio between the defending of public interests and the private interests, the limitation of the protection of property rights in the public interest and other issues.

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ПРОБЛЕМЫ ДОКАЗАТЕЛЬСТВ И ДОКАЗЫВАНИЯ В УГОЛОВНОМ СУДОПРОИЗВОДСТВЕ ЛИТВЫ

Уголовно-процессуальный кодекс Литовской Республики (далее – УПК Литвы) предусматривает одну статью, посвящённую доказательствам и процессу доказывания. Структура 20 статьи УПК Литвы состоит из пяти частей, в которых указывается:

- что является доказательством;
- субъект, решающий, какую информацию признавать доказательством;
- критерии доказательств;
- правила оценки доказательств в суде.

В уголовном процессе данные, полученные в установленном законом порядке, считаются доказательствами. Это означает, что данные могут быть получены не только на основании уголовно-процессуального закона, но и других законов. Например, Закон о полиции, Закон о специальной следственной службе, Закон об уголовной разведке, Закон о налоговом администрировании и так далее. Отдельные законы предусматривают процесс деятельности служб с учётом их административной и профилактической деятельности. Данная деятельность также предусматривает получение и обработку данных о различных деяниях физических и юридических лиц и документальное их сопровождение. Иными словами, получение доказательств нарушений или преступлений. Однако, получение “доказательств” до уголовного процесса и их легитимность и является главной проблемой вопроса доказывания в уголовном процессе в целом.

Такое широкое описание доказательств создаёт множество практических проблем. Ранее уголовный процесс сталкивался с проблемами легитимации оперативно-розыск мероприятий при производстве предварительного расследования. Часто звучали соображения о том, что следователи не принимают “стоцентные” доказательства криминальной разведки. Органы предварительного расследования были тем барьером, который обязаны были пройти “оперативники”. Сегодня вопрос в том, что претензии объективности расследования, вместе с этим обоснованности и качества доказывания, предъявляют суды, рассматривающие уголовные дела и адвокаты, выполняющие защиту подозреваемых и обвиняемых. Вектор переместился из внутренней среды досудебного расследования во внешний – судебное разбирательство. Это в свою очередь влияет и на качество правосудия.

Проблемы возникают не только по форме, но и по содержанию. В этом сообщении рассматриваются эти и другие проблемы.

MENEDŽMENTS

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MANAGEMENT

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ADAPTATION OF DIGITALIZATION TO MANAGE WASTE IN BALTIC COUNTRIES

Globalization enables the free flow of ideas through the internet. Currently, all the management-related disciplines in the world are getting merged with digitalization. The interconnectivity with digitalization steered the world to reach its peak of innovation. The growing influence of digitalization in the waste management sector is the latest trend in the globe. Sustainable globalization is the outcome of proper waste management practices. The European Union is still at the initial phase of the digital transformation in the waste management sector. Waste management sectors in Lithuania, Estonia, and Latvia are at their initial stage of digitalization-related innovations. Digital transformation in the waste sector assures efficiency in waste separation schemes and resource management. Economic efficiency and safety are guaranteeing factors too. The present research work intends to analyze the digitalization of the waste management sector in EU and Baltic countries. The driving factors of innovative digital technologies and present and future applications in waste management were discovered. The inhibiting factors and forthcoming barriers in digital waste management were uncovered too. A comprehensive and circular-economized digital waste management applications concerning Baltic countries will be investigated in the future.

Nadežda Giptere

PAŠVALDĪBAS UN SABIEDRĪBAS LĪDZDALĪBAS IZPĒTE PRIVĀTBŪVNICĪBAS JOMĀ

Civilizācijas attīstības vēsture vienmēr ir saistīta ar cilvēku apmešanās vietu. Līdz ar Latvijas Satversmes garantētām tiesībām ikvienai personai uz īpašumu, pastāv arī pienākums atbildēt par īpašuma izmantošanas, tostarp, apbūves, atbilstību tiesību normu prasībām. Šīs dienas būvniecības juridiskā pamatnē ir ievērojama likumdošanas pareizības un kārtības nesaprotamība. Būvniecības likumdošana, kā normatīvo un likumdošanas aktu kopums, spēlē svarīgu lomu visā ekonomikas jomā un katra cilvēka ikdienas dzīvē.

Pašvaldības darbība pilsētplānošanā un būvniecībā ir neatdalāma no sabiedrības, iekļaujot sevī vides aizsardzības jomu, cilvēku dzīves un veselības aizsardzību, pilsoņu satversmes tiesību aizsardzību. Šiem mērķiem ir pieņemti pašvaldības ārējie normatīvie akti par teritoriālo plānojumu un apbūves noteikumiem. Pašvaldība, pildot ar likumu noteiktas vietējas varas funkcijas, tai skaitā būvniecības regulējuma ievērošanā, sastopas ar vairākiem būvniecības regulējuma pārkāpumiem, īpaši privātbūvniecībā, kā rezultātā rodas nelikumīgi izbūvētas ēkas, apdraudēta to ekspluatācija, tiek pārkāpta cilvēku tiesība uz kvalitatīvu dzīvi.

Raksta mērķis ir izanalizēt patvaļīgas būvniecības problēmu rašanās iemeslus, novērtēt pašvaldības iespējas to samazināšanai. Lai sasniegtu pētījuma mērķus, kvantitatīvi kvalitatīvajā pētījumā tika izmantotas sekojošās pētīšanas metodes: tiesību aktu un tiesu materiālu statistiskā un analītiskā analīze, strukturētās intervijas ar pašvaldības juridiskā departamenta un pilsētplānošanas un būvniecības departamenta speciālistiem. Pētījuma rezultātā tika izstrādāti priekšlikumi patvaļīgas būvniecības problēmas risināšanai, ar kuru palīdzību varētu panākt efektīvāku sabiedrības līdzdalību.

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SABIEDRĪBAS NOVECOŠANĀS IZAICINĀJUMU RISINĀJUMI PASAULES VESELĪBAS ORGANIZĀCIJAS POLITIKAS IETVAROS

Atslēgvārdi: *sabiedrības novecošanās, seniori, veselīga novecošanās, sociālā politika, eidžisms*

Latvijā notiek strauja sabiedrības novecošanās, palielinās vecāka gadagājuma cilvēku īpatsvars. Vienlaikus visā pasaulē notiek ilgstošas pārmaiņas demogrāfiskajos procesos un tiem ir dažādas negatīvas sekas. Reaģējot uz sabiedrības novecošanās izaicinājumiem, Pasaules Veselības Organizācija (PVO) un citas starptautiskās struktūras izstrādā stratēģijas, rīcības plānus un rekomendācijas demogrāfisko procesu ietekmes mazināšanai.

Lai sabiedrības novecošanās procesu aplūkotu kā globālu problēmu, rakstā tiek pētīti un analizēti atbilstoši starptautiskie dokumenti. Apkopojot dažādu zinātnisko publikāciju ekspertu viedokļus, šajā pētījumā tika noteiktas sociālās politikas sabiedrības novecošanās jomā veidošanas priekšnosacījumi, satura prioritātes un raksturīgās īpašības. Tika izpētīti PVO politikas pamatdokumenta „Novecošanās un veselības globālās stratēģijas un darbības plāna” saturs, pamatprincipi un rekomendācijas. Pamatojoties uz dokumentu analīzi, rakstā tika salīdzinātas divu valstu (Austrijas un Baltkrievijas) nacionālās stratēģijas – sociālās politikas programmas, kuras vērstas uz senioru veselības uzlabošanu un veselīga dzīves veida veicināšanu; apskatītas perspektīvas Latvijas stratēģijas un rīcības plāna veidošanā.

Raksta sagatavošanas gaitā izmantotas tādas pētniecības metodes kā starptautisko organizāciju, dažādu valstu stratēģiju un citu normatīvo dokumentu analīze, publicēto zinātnisko rakstu analīze u.tml., tika izvērtētas līdz šim brīdim esošās un perspektīvo aktivitāšu, kā arī nacionālās stratēģijas izveides iespējas Latvijas sabiedrības novecošanās ietekmes mazināšanai.

Raksta mērķis: balstoties uz PVO un citu starptautisko organizāciju, kā arī citu valstu izstrādāto, dokumentu izpēti, salīdzināt dažādas sociālās politikas veidošanas pieejas, uz kā pamata tika izstrādāti Latvijas nacionālās stratēģijas pamatprincipi un izveides priekšnosacījumi, lai mazinātu sabiedrības novecošanās negatīvās sekas.

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VESELĪBAS APRŪPES PERSONĀLA PROFESIONĀLĀS KOMPETENCES NOVĒRTĒŠANA SLIMNĪCĀ

Atslēgvārdi: *veselības aprūpes personāls, profesionālā kompetence, profesionālās kompetences paaugstināšana, profesionālās kompetences novērtēšana*

Neskatoties uz straujo medicīnas tehnoloģiju un veselības aprūpes pakalpojumu attīstību, veselības aprūpes personāla nozīme ārstniecības iestāžu darbībā ir būtiska. Personāls kā resurss ir nozīmīgākais un vērtīgākais kapitāls, kas nodrošina nepārtrauktu un sistēmisku iestāžu darbību, tās attīstību perspektīvā. Ārstniecības iestāžu darbinieki, darbinieku kompetence un attieksme noteiks klientu un pacientu apmierinātības un ārstniecības rezultātus, tāpēc katrai ārstniecības iestādei ir nepieciešams noteikt profesionālās kvalifikācijas celšanas, darbinieku apmācību organizēšanas kārtību, kas piemērojams slimnīcas personāla profesionālajai kompetencei. Augsta profesionalitāte palielina sabiedrības uzticēšanos mediķu profesijai un apliecina labas prakses īstenošanu konkrētajā slimnīcā (C62 Oficiālais vēstnesis – EUR-Lex-Europa EU).

Kompetences ir viens no personāla vadības instrumentiem, kas vienkāršos rīcības aprakstos skaidro nodarbinātajiem, kādu rīcību iestāde no viņiem sagaida. Kompetenču apraksti ir palīgs gan vadītājam, gan nodarbinātajam: vadītājam tie palīdz vēlamās rīcības prasību definēšanā, skaidrošanā un novērtēšanā, bet nodarbinātajam tie palīdz labāk izprast un izpildīt iestādes un vadītāja prasības (Bior, 2016).

Konkrētā veselības aprūpes iestādē – slimnīcā tika analizēta personāla kompetences novērtēšanas esošā sistēma, tās efektivitāte slimnīcas stratēģisko mērķu sasniegšanā ar iespējām nodrošināt personāla profesionālo izaugsmi. Veicot normatīvo dokumentu, literatūras analīzi labās pieredzes skatījumā, tika pētītas efektīvākās metodes kompetenču uztrēšanai, izprotot lokālos traucējošos faktorus tās ieviešanai. Kvantitatīvās pētījuma metodes deva pētījuma instrumenta adaptācijas iespējas, ievirzot slimnīcas veselības aprūpes personāla kompetences novērtēšanu tai piemērojamākai sistēmai. Personāla apmierinātības līmenis liecina par atgriezenisās saites nepietiekamību starp darbinieku un vadītāju, komunikācijā par iespējām pilnveidot profesionālo kompetenci.

Pētījuma mērķis: izpētīt un izanalizēt slimnīcā pastāvošo veselības aprūpes personāla kompetences novērtēšanas kārtību.

MATEMĀTIKA

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MATHEMATICS

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FLOQUET MULTIPLIERS OF PERIODIC SOLUTIONS OF A HAMILTONIAN SYSTEM WITH TWO DEGREES OF FREEDOM

A cubic two-parameter Hamiltonian system with two degrees of freedom is considered. The existence of periodic solutions for a given system and the dynamics of the Floquet multipliers are investigated depending on the parameters.

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ON DIRICHLET PROBLEM FOR THE SECOND ORDER NONAUTONOMOUS NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS

The Dirichlet problem for the second order ordinary differential equations is considered. This problem arises in the theory of heat conduction. We study the existence and estimates of the number of positive solutions using the bifurcations analysis technique.

This research is funded by the Latvian Council of Science, project "Analysis of complex dynamical systems in fluid mechanics and heat transfer", project No. lzp-2020/1-0076.

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THE APPLICATION OF THE SABATINI TRANSFORMATION

Cubic differential equations are considered together with the two-point boundary conditions. The quadratic term, containing the derivative, is added. Using the Sabatini transformation, we reduce this equation to the equation, not containing the derivative of unknown function. The equation $x'' + f(x) x'^2 + g(x) = 0$ (*) can be reduced to a conservative. Our goal is to compare behaviour of solutions of (*) with that for shortest equation $x'' + g(x) = 0$. We attract our attention to the case $g(x) = a x - b x^3$. In particular, we would like to compare the number of solutions for the damped equation and shortened one.

MŪZIKA

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MUSIC

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IESKATS ŽANRA ĀRIJA EVOLŪCIJĀ

Atslēgvārdi: *opera, ārija, dziesma, evolūcija*

Mūsdienās vokālās mūzikas žanru *ārija* mēs saprotam kā noslēgtu, lirisku skaņdarbu solo balsij ar instrumentālo pavadījumu, retākos gadījumos, operas, kantātes, oratorijas vai kāda cita, izvēsta skaņdarba sastāvdaļu. Mūsdienu operā *ārija* lielā mērā ir zaudējusi savu dramatisko mērķi; tā vietā dažreiz tiek ieviestas dziesmas, kas parasti nav saistītas ar drāmu, lai sniegtu liriskas starpspēles.

Termins *ārija* tika lietots jau 16. gadsimtā, tas tika izmantots dzejoļa skaitīšanai konkrētā metriskā formā, piemēram, *aria di ottava rima*. Tuvojoties gadsimta beigām, strofiskas dziesmas tika komponētas jaunajā monodiskajā stilā, kuras sauca par *ārijām*. 16. gadsimtā Francijā par āriju sauca vienkāršu dziesmu, taču no 17. gadsimta sākuma par melodisku instrumentālu skaņdarbu ar plašu dziedošu melodiju. Tādas *ārijas* bija sastopamas baletos, svītās un *concerto grosso*.

Solista ārija ir augstākais mākslinieciskā izpildījuma punkts operā, un bieži tikai izcilākie dziedātāji, kas jau ir zvaigznes, var parādīt, kāpēc viņiem tiek maksāts tik daudz.

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ROMANTISMA ESTĒTIKA, FILOZOFIJA, TEMATIKA, ŽANRI UN JAUNINĀJUMI POLIJAS MĀKSLĀ UN MŪZIKĀ 19. GADSIMTA PIRMAJĀ PUSĒ

Atslēgvārdi: *romantisms, mūzika, Šopēns, nacionālais, filozofija*

Romantisma pirmsākumi meklējami Vācijā, vēlāk romantisms kā stils attīstījās Francijā. Taču šis laika posms visvairāk saistās ar slāvu valstu nacionālās savdabības izpausmēm – Polija, Krievija, Čehija. Pamats tam sekojošs: mākslinieciskās izpausmes bija cieši saistītas ar nacionālās atbrīvošanās kustību un pastiprināto interesi par nacionālo folkloru.

Romantisma periodā instrumentālās mūzikas sasniegumi bija sasitīti arī ar iekšējo prototipu maiņu jeb retorikas un drāmas vietā – poēzija un literatūra. Tas nozīmēja atteikšanos no klasiskās domāšanas normām, programmatisma un tēlainas iekšējās pasaules pieņemšana. Filozofijas pamatā – labā un ļaunā esamība. Cilvēku cerība uz labāko un patieso var būt nomainīta uz Sātānisko un ļauno. Šī filozofija izpaudās arī jaunveidojamajos mūzikas žanros – balāde, poēma, leģenda. Negatīvo emociju pārdzīvojumi izpaudās skaņdarba kulmināciju vietās, cīņas aspektā (labais un ļaunais, prieks un skumjas, mīlestība un nāve) un iztrādājumā. Oratoriskās runas prototips tika nomainīts uz poētisko balādi.

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ROMANTISMA IEZĪMES ANTONA RUBINŠTEINA OPERĀ DĒMONS

Atslēgvārdi: *romantisms, Antons Rubiņšteins, opera Dēmons*

Kā pastāvīgs virziens mūzikā romantisms izveidojās 19. gadsimta pirmajā pusē. Priekšplānā tika izvirzīta tautas māksla un nacionālās atbrīvošanas kustība. Stila īpašība romantismā ir tendence sintezēt dažādus mākslas veidus, galvenokārt tas izpaudās operā un programmatiskā mūzikā. Kļūst brīvāka mūzikas forma, tonālais plāns, īpaši attīstās caurviju attīstības paņēmieni.

Pēterburgas konservatorijas dibinātājs, direktors un profesors Antons Rubiņšteins ir spilgta un ievērojama krievu personība, profesionāls pianists un komponists. Sacerējis 15 operas un 5 oratorijas, 6 simfonijas, 5 klavierkoncertus, vairāk nekā 200 skaņdarbu klavierēm, ap 20 instrumentālu kameransambļu, tostarp četras klavieru sonātes, vairāk nekā 160 dziesmas un romances.

Opera kā pastāvīgs žanrs radās Itālijā. Tas ir sintētisks muzikāli dramatisks darbs, kurā tiek apvienota poēzija, vokālā un instrumentālā mūzika, skatuves māksla, scenogrāfija, horeogrāfija. Pretēji atsevišķiem āriju, rečitatīvu, duetu un ansambļu priekšnesumiem, 19. gadsimtā, romantisma operā veidojās muzikālā drāma ar nepārtrauktu simfonisko attīstību. 1871. gadā A. Rubiņšteins pabeidza savu labāko operu – *Dēmons*.

Melodisks un lirisks varoņu raksturojums, ar krāsaini veidotu mūziku vēsta par labā un ļaunā cīņu, kura risinās cilvēku un garu apdzīvotā pasaulē. Stāsts ir par kaisli, vientulību un pēdējo izmisīgo mēģinājumu mīlēt. Pāvels Viskovatovs veidoja operas libretu pēc Krievijā viena no nozīmīgākajiem romantisma pārstāvjiem Mihaila Ļermontova austrumu poēmas *Dēmons* motīviem.

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ANTONS RUBINŠTEINS. TAMĀRAS ROMANCES INTERPRETĀCIJU SALĪDZINĀJUMS

Atslēgvārdi: *romantisms, Rubiņšteins, opera Dēmons, romance, interpretācija*

Antons Rubiņšteins bija viens no 19. gadsimta otrās puses krievu mūzikas dzīves centrālajām figūrām. Viņa personā apvienojās ģeniāls pianists, aktīvs muzikālās dzīves organizētājs un izcils komponists, dažāda žanra skaņdarbu sacerētājs, kuri saglabā savu nozīmi un vērtību līdz mūsdienām.

A. Rubiņšteina radošais mantojums ir milzīgs. Viņš komponēja 13 operas un četras garīgās operas-oratorijas, sešas simfonijas un apmēram desmit citus skaņdarbus orķestrim, ap 20 skaņdarbu kamermūzikas ansambļiem, klavierdarbu skaits pārsniedz 200 sacerējumu, sacerētas apmēram 180 romances ar krievu, vācu, serbu dzejnieku tekstiem.

A. Rubiņšteina opera *Dēmons* ir viens no spilgtākajiem viņa daiļrades piemēriem, kas ietver sevī komponista mūzikas valodas krāšņumu un daudzveidību. Māksliniecisks apliecinājums ir arī *Tamāras romance*. Interpretācijā ir mākslinieka radošā pieeja un personīgais redzējums kāda skaņdarba atskaņošanai.

Katra *Tamāras romances* interpretācija ir savādāka, jo katram interpretam ir individuāla uztvere, prasme un pieredze.

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SERGEJA RAHMAŅINOVA KLAVIERU DAIĻRADES ĪPATNĪBAS

Atslēgvārdi: klaviermūzika, prelūdija, daiļrade, stils

Par vienu no centrālajām figūrām krievu mūzikā 19. gadsimta beigās un 20. gadsimta sākumā kļuvis izcilais komponists, pianists un diriģents Sergejs Rahmaņinovs (*Сергей Рахманинов*). Būdams arī virtuozs pianists un klavierspēles meistars, klaviermūzikai komponists velta padziļinātu uzmanību, tai kļūstot par nozīmīgāko un plašāko viņa darbības lauku, īpaši pirmsrevolūcijas periodā.

Klavieru daiļradē komponists veltījis uzmanību dažādiem žanriem, tādējādi pārstāvēdams plašu klaviermūzikas spektru, un starp nozīmīgākajiem piemēriem jāmin izvērstas formas skaņdarbi, kā, piemēram, četri klavierkoncerti; *Rapsodija par Paganīni tēmu*; *Variācijas par Korelli tēmu*; divas klaviersonātes, kā arī klavieru miniatūras, to spilgtākie piemēri: 24 prelūdijas; 17 *etīdes-gleznas*; seši muzikālie momenti; 12 skaņdarbi klavieru ansambļiem. Sergeja Rahmaņinova klavieru daiļrade gadsimtu mijā galvenokārt izpaužas kā miniatūru komponēšana. Spraigs dramatisms, lirisko pārdzīvojumu intensitāte, tāpat nosliece uz monumentālu, virtuozu rakstības stilu, uz plašām mūzikas formām caurstrāvo un tuvina tās komponista brieduma gadu prelūdiņām un etīdēm-gleznām.

Īpašu lomu komponista klavieru daiļradē ieņem prelūdijas, tās izceļas ar māksliniecisko meistarību un satura daudzveidību; tajās ietvertas visas galvenās komponista klavierstila pazīmes. Neaprobežojoties vienīgi ar liriku, Rahmaņinovs ievieš savās prelūdiņās monumentālus heroiski episkus un tautiskus žanra tēlus. Līdz ar to Rahmaņinova prelūdiņas ir lieli, sevišķi virtuozī skaņdarbi, un daudzas no tām balstās uz spilgtiem kontrastiem, ar savu spožumu, sulīgumu un intensitāti nereti līdzinoties koncerta žanram.

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KLODA AŠILA DEBISĪ SKAŅDARBA RAPSODIJA ALTA SAKSOFONAM UN ORĶESTRIM INTERPRETĀCIJAS

Atslēgvārdi: Debisī, rapsodija, saksofons, interpretācija

Klods Ašils Debisī (*Claude Achile Debussy*) ir pirmais un visredzamākais franču impresionisma pārstāvis. Popularitāti ir guvis viņa skaņdarbs Rapsodija alta saksofonam un orķestrim.

Interpretācija (no latīņu valodas *interpretatio* – skaidrojums) ir skaņdarba radošs izpildījums. Eksistē šī jēdziena dažādi skaidrojumi (Jurijs Bulučevskis (*Юрий Булучевский*), Ludvigs Kārklīnš, Georgijs Keldišs (*Георгий Келдыш*), Stenlijs Sadī (*Stanley Sadie*) u.c.). Katra izpildītāja interpretācija ir individuāla, jo skaņdarba izpratne ir vērsta gan uz izpildītāja emocionālo stāvokli, muzikālo izpratni, spēles paņēmieni lietošanu, pētījumu un laika gaitā gūto pieredzi un zināšanām skaņdarbu atskaņošanā.

Skaņdarba Rapsodija alta saksofonam un orķestrim atskaņojumam ir izvēlēti trīs interpretāciju paraugi: Žana Marī Londeka (*Jean-Marie Londeix*) un orķestra (*Orchestra of Radio Luxembourg*) interpretācija, Marsela Murē (*Marcel Mule*) un orķestra (*Symphony Orchestra of The French Radio*) interpretācija un Mihaīla Selvas (*Michele Selva*) un koncertmeistara Dario Džiovanni (*Dario Giovannini*) interpretācija.

Salīdzināšanas kritēriji: kadenču spēles izteiksmība, atskaņošanas īpatnības, skaņdarba dinamika, artikulācija, tonis un vibrato, skaņdarba frāzējums, mūzikas tēls, tempa maiņu precizitāte.

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THE MUSICAL THEORETICAL ANALYSIS OF FIRST MOVEMENT OF SONATA FOR FLUTE AND PIANO OP. 164 BY FRANCIS POULENC

Key words: Poulenc, sonata for flute and piano, French music

Francis Jean Marcel Poulenc (1899–1963) – French composer, outstanding pianist, one of the members of the *Les Six* composers' group. Poulenc has composed music for solo instruments and orchestras, chamber music, operas, oratorios and ballets. He has used various compositional techniques in his music (including Dadaism). Oftentimes in his melodies, he would reflect the liveliness of Paris, with its hustle and bustle, tense pulse, and joy of life, coupled with melancholy and hopes.

The Sonata for Flute and Piano was written in 1957 for the French flutist Jean-Pierre Rampal (1922–2000), dedicated to the American patron Elizabeth Sprague Coolidge (1864–1953). The composition was premiered in 1957 at the Strasbourg Music Festival, and was performed by Jean-Pierre Rampal and the author. The sonata quickly became a favorite in the repertoire of world flutists, and is still performed at concerts and competitions alike.

The sonata is a composition created in the traditions of romanticism, with playful, simple imagery, in which the dialogue of flute and piano portrays different characters and moods. The main value of this sonata is the bright palette of tonal colors, radiating from the beautiful, relief melodies. This composition is rich in harmonies and full of romantic quests.

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SOMIJAS BAJĀNA UN AKORDEONA MŪZIKA 20. GADSIMTA BEIGĀS UN 21. GADSIMTA SĀKUMĀ

Atslēgvārdi: Somija, akordeons un bajāns, komponisti, skaņdarbi, atskaņojums

Somu akordeona un bajāna atskaņotājmāksla iezīmējas ar komponistu un mūziķu tieksmi meklēt un iekļaut jaunus mūzikas izteiksmes līdzekļus un skaņdarbu atskaņošanas jaunās koncepcijas. Lasse Pihlajama (*Lasse Pihlajamma*) vērtējums: *situācija Somijā ir īpatnēja: 80. gadu vadošie komponisti radīja augstvērtīgu akordeona mūziku gan solo instrumentam, gan arī kameransambļiem.*

Būtiska loma bajāna un akordeona mūzikas izplatīšanai Somijā bija mūziķim Mogensam Ellegardam (*Mogens Ellegard*). Jauna veida repertuāru bajānam un akordeonam sacerēja somu komponisti Lasse Pihlajams (*Lasse Pihlajamma*), Erkis Jokinens (*Erkki Jokinen*), Mattis Murto (*Matti Murto*), Petri Makonens (*Petri Makkonen*) un citi. Pateicoties akordeona tembrālajām un tehniskajām iespējām un kvalitatīvi sacerētajiem komponistu oriģinālskaņdarbiem, akordeons pakāpeniski iekaroja profesionālo mūzikas instrumenta statusu.

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VOICE ERGONOMICS FROM THE PERSPECTIVE OF CHOIR CONDUCTORS

Key words: *choir conductors, voice ergonomics, online survey*

Introduction: Latvia has a strong tradition of choir singing. Each choir has a leader – a choir conductor who inspires the singers. Choir conductors are professional voice users who need a skillful, healthy voice. Voice ergonomics is a complex field consisting of a working environment and working practice. There are no studies in Latvia investigating voice ergonomics in conductors. Therefore our study aimed to investigate voice ergonomics knowledge in conductors and factors related to conductors working load, environment, and practice.

Materials and methods: A cross-sectional study using an online survey was organized in the population of Latvian choir and ensemble conductors. The online survey was based on the Questionnaire of Voice Ergonomics Risk Factors supplemented by choir conductors' working practice questions. One hundred fifty-five choir and ensemble conductors (74.2% females) completed the questionnaires.

Results: The mean age of respondents was 47.4 years, SD = 13.8 years, range 17–75 years; 76.2% of conductors worked more than ten years in the conductor's profession. More than half of conductors (57.4%) led more than one choir, 72.3% were conductors of mixed choirs. Working load: the mean number of rehearsals per week was 3.3, SD = 2.6; the mean number of singers in a choir was 29.7, SD = 12.0; 69.7% of conductors had an additional job as music teachers. Health status: voice disorders in anamnesis had 19.4% of respondents; 59.6% of all cases had shoulder and neck muscle pain, 35.1% had back pain; 22.8% had carpal tunnel syndrome, and 21.9% had pain and restrictions in a shoulder joint. Working environment: 39.3% out of all respondents answered that they did not hear the noise inside the rehearsal rooms, 27.8% did not hear disturbing noise outside rooms, 31% noted reverberation in rooms. 25.1% of conductors admitted that the rehearsal rooms' air temperature was too high or too low, and the air was stuffy (19.4%). Posture and working practice: 18.7% of respondents characterized their body posture during rehearsal as uncomfortable and bad; 39.4% used loud or very loud voice, 21.0% used strain voice, and 33.5% of all respondents had vocal fatigue after rehearsals; 35.5% of conductors did not have breaks during rehearsals. Sixty-two percent of all respondents judged their knowledge of voice ergonomics as rather good or very good, and 45.2% confirmed that they used this knowledge in daily practice.

Conclusions: The survey results gave important information about voice ergonomic factors in choir and ensemble conductors, which outlined the directions for vocal health improvement in this group of professional voice users.

Pētījums veikts FLPP projektā „Kordirigentu vokālās slodzes noteikšana balss ergonomikas kontekstā”, Nr. lzp-2020/2-0250.

FILOLOĢIJA

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PHILOLOGY

Linda Gaile

DIDAKTISIERTE ANALYSE DER VORBEREITUNGSPHASE DER SPRACH- UND KULTURKOMPETENZ FÜR DAS KULTURDOLMETSCHEN

Das Dolmetschen wird in der Dolmetschwissenschaft als äußerst komplexer kognitiver Prozess eingestuft, für dessen Ausführung in erster Linie gründliche Kenntnisse der Ausgangs- und Zielsprache vorhanden sein müssen. Die Sprachkompetenz ist unmittelbar mit der zweitwichtigsten Kompetenz des Dolmetschers, nämlich, der Kulturkompetenz verbunden. Um die dolmetscherische Tätigkeit reibungslos ausführen zu können, wird vom Dolmetscher eine eingehende Vorbereitung erwartet. Die Vorbereitungsphase für das eigentliche Dolmetschen ist insoweit von großer Bedeutung, da diese das Gedächtnis des Dolmetschers entlastet und die Auffassung der Originalrede während dem Dolmetschen erleichtert.

In der didaktisierten Analyse der Vorbereitungsphase wird auf eine spezifische Art des Dolmetschens eingegangen – das Kulturdolmetschen.

Das Ziel dieser Untersuchung ist anhand der von Rednern für eine wissenschaftliche Konferenz zu Kultur-, Literatur- und Geschichtefragen vorbereiteten Referate die Vorbereitungsphase für das Kulturdolmetschen didaktisch zu analysieren und dabei auf die Fragen: „Wie muss der Dolmetscher in der Vorbereitungsphase vorgehen? und Welche Nuancen der Sprach- und Kulturkompetenz für das Kulturdolmetschen in Betracht gezogen werden müssen?“.

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LIETVĀRDA APGUVES TEMATIKA SPĀŅU VALODĀ KĀ SVEŠVALODĀ: KONTRASTĪVAIS SKATĪJUMS

Lietvārds ir pirmā valodas vienība, ar kuru saskaras valodas apgūvējs, mēģinot saprast, kā nosaukt kādu priekšmetu, parādību, pazīmi vai stāvokli. To apliecina arī lingvodidaktikas materiālu satura augšgalā norādītā lietvārda, tā dzimtes un skaitļa apguve. Taču vārdi paši par sevi nespēj izteikt domu un katrā valodā ir sava sistēma, kā tas tiek panākts (Loja 1968, 204), tāpēc ir būtiski izprast katras apgūstamās valodas vārdšķiru paradigmas un to, kā tiek aizstātas tās vārdu formas, kuras šķietami trūkst.

Lietvārda paradigma spāņu valodā būtiski atšķiras no latviešu valodas, jo spāņu valoda ir vairāk analītiska un tajā locījumus izsaka ar dažādu prievārdu palīdzību, bet to noteiktību vai nenoteiktību izsaka artikuls, kurš tikai dažos gadījumos ir pielīdzināms latviešu valodas norādāmajiem vietniekvārdiem un lielākoties latviešu valodas lietotājam nav izprotams.

Pētījuma mērķis ir uzsvērt būtiskākās spāņu valodas lietvārda apguves grūtības, kas izriet no spāņu un latviešu valodas gramatikas un spāņu lingvodidaktikas izdevumu analīzes lietvārda morfosintaktisko atšķirību fiksēšanai abās valodās.

Pētījuma metodoloģija izriet no latviešu gramatikas materiālos (Kalme, Smiltņiece 2001, Beitiņa 2009, LVG 2013 u.c.) aprakstīto lietvārda morfosintaktisko pazīmju analīzes un to sastatījuma ar spāņu valodas gramatiku (Alarcos 2000, RAE 2017 u.c.) un spāņu lingvodidaktikas izdevumu piedāvātajiem

lietvārda apguves risinājumiem (Rozenberga 1997, Aragonés, Palencia 2010, Seijas, Troitiño 2018, González Romero 2019 u.c.).

Pētījuma rezultātā secināts, ka mācību materiālos būtu nepieciešams iekļaut pilnīgāku lietvārda skaidrojumu, apvienojot to uzreiz ar artikula lietojumu un prievārdiem, kas izsaka latviešu valodas lietvārdiem ekvivalentus locījumu. Līdzīgi būtu nepieciešams sastatīt arī citas patstāvīgās vārdšķiras, kas ietekmē valodas morfoloģiju un sintaktiski un veidot spāņu valodas mācību līdzekļus, kuru mērķauditorija ir latviešu dzimtās valodas lietotāji.

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MANIFESTATIONS OF LINGUISTIC CREATIVITY AS A REACTION TO COVID-19 PANDEMIC IN LITHUANIA

The coronavirus pandemic that reached Lithuania in the early spring of 2020 left its mark on language as well. The emergence of neologisms and new phrases was observed during the first weeks of the quarantine, which was imposed in mid-March 2020. Coronavirus neologisms (or coronalogisms) are being coined quicker than ever.

The authors of the presentation try to reveal the manifestations of linguistic creativity observed during the pandemic. The continuously updated Database of Lithuanian Neologisms and various online resources are used to study the words and phrases that are used in Lithuania, both verbally and in writing, to describe the coronavirus pandemic, and the worldview and emotional attitude of the Lithuanian people that emerges from the neologisms of the period. The primary focus here lies on Lithuanian neologisms, compound words, and blends in particular. Some cases of individual, often occasional word formation and more popular neologisms from the Database of Lithuanian Neologisms are discussed separately. The main ways of making new formations and the most popular lexemes behind the new formations are presented as well.

Analysis of the examples of new formations and other cases of linguistic creativity is employed to demonstrate how unexpected changes in life spark linguistic creativity that combines contemporary experience and cultural tradition of the language community.

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NICKNAMES OF TEACHERS AND STUDENTS: CONCEPTUALISATION OF NICKNAMERS

The article discusses the usage of nicknames given for teachers and students of Lithuanian city gymnasiums. The aim of the research is to reveal how a nicknamer is characterized in the gymnasium. It is intended to find out how and to what extent the respondents of the gymnasium identify themselves with the nicknamers and how they conceptualize the creator of the nicknaming discourse.

The research summarizes the survey data of 189 respondents from Lithuanian city gymnasiums. The survey respondents provided 370 nicknames. The research material comprises part of the data collected by the method of the original questionnaire survey.

For modern students, the creation and usage of nicknames is a relatively common phenomenon. Interestingly, students' nicknames are usually given considering an individual's unique feature, desire to feel intimacy and to distinguish them from others, rather than to mock another person. This demonstrates that students use nicknames consciously. Most respondents tend to view the creator and user of the nicknaming discourse as socially attractive, creative, witty, the one who considers the context of nickname usage and respects the nicknamed person.

In conclusion, most respondents have a positive attitude towards students' and teachers' nicknames and tend to use them more frequently. Respondents' responses negate the stereotype that nicknames are used solely for the sake of mockery, emphasising negative physical, manner or other characteristics. In this case, there is a highlighted hypothetical stereotypical opposition between the representatives of the younger and the older generations. Thus, the questionnaire-based survey allows the formulation of a generalizing assumption that the young respondents have a very positive conceptualization of the nickname creator and user.

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PUBLIC PERCEPTION REGARDING THE FORMS OF MARRIED WOMAN SURNAMES

Key words: woman's surname, suffix and non-suffix surnames, public attitude, onomastics

Until the 13th century Lithuanians were called only by their name. Later the person's position, craft, name of their place of origin, owners or family ties, father's (rarely brother's) name were started next to the first name.

Women's surnames in Lithuania are formed according to the surname of the father (for unmarried women) or of the husband (for married women). Until 2003 the surnames of married women were traditionally formed with the suffix -iene. However, in 2003, after the legalization of non-suffixed surnames of married women in Lithuania, many disagreements arose. The aim of this study is to find out the attitudes of women of all ages towards suffix and non-suffix surnames. The survey was used for this purpose; the survey had 500 responders between the ages of 13 and 61.

According to the survey data, the surname of older women is more often used to follow traditions, emphasize their ethnic identity, belonging to a certain social construct, so they often choose last names with suffixes. For younger women, the surname becomes a means of self-expression, they value the sound of the surname more and are less likely to delve into other possible reasons for choice, such as traditions, clarity of status, etc.

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TERM OF TRANSLATION QUALITY: CONTENT-ORIENTED ASPECTS

Nowadays the issue of translation quality is still topical as scientists provide a set of criteria for assessment of translation quality, translation agencies have their own list of quality criteria, but clients' expectations may differ from the ones mentioned above. Anyway it is crucial to observe the requirements of all involved parties in the translation process. The aim of the article is to analyze different text types and create a list of criteria matching both expectations of clients and quality guidelines translators must follow. The article will focus the content-oriented aspects in the assessment of translation quality as they are the most crucial ones for all parties involved.

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THE FIGURE OF "HOMO SACER" IN NADINE GORDIMER'S "THE PICKUP"

Key words: *Giorgio Agamben, 'homo sacer', state of exception, postcolonial novel, Nadine Gordimer, immigration*

This study is a critical reading of the immigrant characters in a contemporary postcolonial immigration novel as the literary embodiment of Giorgio Agamben's figure of *homo sacer*. The literary work analysed in the paper is Nadine Gordimer's novel "The Pickup" (2001). The theoretical framework of the study is Agamben's (1998) political theory of bare life and state of exception. The author reinforces the interpretative reading of the literary work through interdisciplinarity and contextuality. These modes of research are provided by the methodologies of postcolonial literary studies. The results of this research show that the immigrant characters are stripped of their rights, reduced to a state of uncertainty that Agamben refers to as "bare life" and subjugated to the forces of the global postmodern age such as marginalisation, capitalism and neo-colonial politics of mobility.

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THE WORD BRACK AND ITS RELATED MEANINGS IN SOME GERMANIC LANGUAGES AND ITS CULTURAL EXPRESSION

Key words: *concept, meaning, semantic relationships, semantic fields, sets*

On the basis of a theoretical study of a theory of meanings by different schools from Plato till recent days the author of the present research has collected some empirical material and investigated the semantics of the word *brack* in Germanic languages such as English, German, Danish, Norwegian, and Swedish. A structural approach and comparative method, as well as elements of synchronic and diachronic analysis, were used to reveal the meanings of the word *brack* in the analyzed languages with the main meaning "worthless" in old Dutch (the language of origin, 1510, *brak*) and in the selected Germanic languages.

This shared component of their meanings is present in all the analyzed languages and new additional numerous meanings in investigated languages are related. The meaning "worthless" is in the center of a semantic field of these words, and on the periphery of this field are the words with additional or transferred meanings. Some of them pertain to two-three languages out of five analyzed, but some pertain only to one definite language. These latter specific meanings reveal the values and peculiarity of the corresponding culture. All the meanings of the analyzed words will be introduced in the schemes so-called Euler's diagrams.

The corpus consists of 27 meanings of the word *brack* within five languages, thus the analysis of the related meanings shows close semantic relationships between these words and linkage between their specific meanings and peculiarities of the corresponding culture.

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WORDPLAY: TERMINOLOGY IN ENGLISH AND LATVIAN LINGUISTICS

Pun and wordplay do not have universal definitions and it is the ground for discussion to see what is to be considered as pun or wordplay. Several dictionaries define pun as a humorous play on words with two or more meanings. Thus, simplifying the very essence of what pun in actuality is. It is a complex linguistic phenomenon, that involves the ambiguity of language and creates a complex system of layers of meanings that can be either implied or explicit and that play a certain role. In these simplified definitions of this technique, it is forgotten that a pun can be dramatic, ironic or sarcastic as much as it can be humorous.

Even though there are hundreds of techniques that are a part of wordplay, the author of this article has investigated the most important terminology used in English and Latvian linguistics, such as *acronyms, alliteration, assonance, consonance, double entendre* and many others.

Another important aspect is *Relevance Theory*. Relevance theory may be seen as an attempt to work out in detail, one of Paul Grice's central claims than an essential feature of most human communication is the expression and recognition of intentions. Some scholars agree to the idea that utterances raise expectations of relevance, but disagree with the necessity for the Cooperative Principle and its maxims, the treatment of figurative utterances, as well as the focus on the implicit rather than the explicit content.

As a result of the research, the author detected that terminology involved in the sphere of wordplay is of high importance. Without the explanation of terminology used in wordplay, it is impossible to understand the meaning and all elements involved in the theory of wordplay.

FIZIKA

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PHYSICS

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DEVELOPMENT OF AN ELECTROCHEMICAL SENSOR BASED ON NANOSTRUCTURED MANGANESE OXIDE

Key words: electrochemical sensor, manganese oxide nanostructures, hydrogen peroxide

Hydrogen peroxide (H_2O_2) detection and control are very important in the industrial, biological and medical sectors, and especially in food processing plants. In high concentrations, it can pose a serious threat to human health as well as environmental pollution. While in living organisms H_2O_2 is a product of a wide range of biological and chemical processes and it is produced by external stimuli and intracellular signaling molecules as a metabolic by-product.

Manganese dioxide (MnO_2) has attracted much attention due to low cost, high safety, environmental friendliness and catalytic property. It is widely used in the manufacture of electrochemical sensors, including H_2O_2 sensors.

In this research flower-like and urchin-like MnO_2 nanostructures and nanostructured coatings were selectively synthesized through simple decomposition of $KMnO_4$ under sulfuric acid condition by controlling reaction temperature using a hydrothermal method. The properties of MnO_2 nanomaterials with different morphologies were studied. The electrochemical characterization of MnO_2 to use as a sensing material for hydrogen peroxide was performed.

Acknowledgements. This work was supported by the European Regional Development Fund's programme "Post-doctoral Research Aid" (a project title "Development of nanomaterial-based electrochemical sensor for detection of hydrogen peroxide"; research application No 1.1.1.2/VIAA/4/20/743; research application agreement Nr. 1.1.1.2/16/1/001).

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ELECTROCHEMICAL DETECTION OF H_2O_2 USING FENTON'S REACTION

Hydrogen peroxide is a natural subproduct of metabolism in living cells. Normally, living cells regulate hydrogen peroxide concentration, however, this can be disrupted by illnesses. In humans, elevated H_2O_2 concentrations in blood can lead to Alzheimer's and Parkinson's diseases, premature cell death, neural cell death, brain mass loss, cancer, and promote metastases spread. Thus, it is beneficial to monitor H_2O_2 concentration in human's blood as a part of health monitoring. An easy to use and cheap method of chemical analysis is electrochemical detection. Hydrogen peroxide is known to react with iron ions, forming free radicals (also known as Fenton's reaction). The goal of this study is to create an electrochemical sensor, that utilises Fenton's reaction to detect H_2O_2 presence and concentration in a solution. The results of this study can further be used for cheation of electrochemical H_2O_2 sensor for hyman health monitoring.

This study was supported by DU internal research grant No. 14-95/2021/11 "Development of an electrochemical sensor for the determination of oxidant concentrations exceeding the physiological norm of healthy cellular structure".

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HYDROGEN PEROXIDE (H₂O₂) DETECTION IN ANALYTES USING DIFFERENT TYPES OF OPTICAL FIBER EVANESCENT WAVE SENSORS WITH ZNO NANOSTRUCTURES COATING AT SENSING REGION

There is an literature demonstrating that the Hydrogen peroxide (H₂O₂) has a great importance for mechanisms that regulates a number of different biological processes in cells. During development of sensor for extracellular and intracellular determination of concentration of Hydrogen peroxide (H₂O₂) the key step is to provide that it will be reliable, affordable and efficient. In recent years, different types of optical fibers evanescent wave sensors were studied and showed possibility and effectiveness for sensing of different substances in analytes, both chemical and biological.

Therefore, during this study were investigated ability to detect Hydrogen peroxide (H₂O₂) in analyte by different types of optical fiber evanescent wave sensors. Semiconductor metal oxides like ZnO are widely used for the detection in various fields like selective sensing of chemical compounds and biological sensing. Metal oxides posses such advantages as low cost, compact size and relatively simple acquisition technology. Performance of these sensors is significantly affected by their morphology and structure. Sensors based on nanomaterials represent a significantly growing trend to increase the sensitivity, selectivity, and speed of response. Also, during this study were practically investigated possibility of enhancement of different optical fiber evanescent wave sensor types by different morphology ZnO nanostructures for Hydrogen peroxide (H₂O₂) detection in analyte. All gained results were summarized. Effectiveness of investigated sensors were compared with other sensor types described in literature.

This study was supported by DU internal research grant No. 14-95/2021/10 "Development of the nanostructured metal oxide coatings and their application in optical sensing for heavy metal detection".

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POSITIVE ORGANIC RESIST AS A MATERIAL FOR ELECTRON BEAM LITHOGRAPHY

Recording capabilities of positive organic resist using focused electron beam presented in this study. Positive resists form an indene carboxylic acid during exposure making them soluble in aqueous alkaline solutions. The possibility of practical use of this material as a resist for electron beam lithography has been investigated.

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TWO-DIMENSIONAL MATERIALS IN SENSING AND BIOSENSING APPLICATIONS

The challenges of the modern world require ever more flexible and intelligent approaches to overcome them. One of the categories of such challenges is the outbreak of viral infectious diseases for which there are no effective drug solutions. Classical diagnostic methods based on enzyme-linked immunosorbent assay are very resource-intensive, that adversely affects the cost of such systems. In this work, the proposed diagnostic and monitoring system is based on new semiconductor two-dimensional (2D) materials. The most promising candidates are layered 2D sulphide materials – e.g., MoS₂, WS₂, ReS₂, SnS₂ and oxide materials – e.g., MoO₃, WO₃, V₂O₅, MnO₂. Due to their unique physical and chemical properties, sensors based on such materials show increased sensitivity and a faster response speed, which favourably distinguishes such systems from other methods. Similar sensors combined into a matrix allow analysing various chemical processes in real time. The use of machine learning algorithms for processing signals of such a matrix will significantly increase the sensitivity and selectivity and will also make possible the deep integration of such systems into the existing digital infrastructure (Internet of Things).

Research proposal: 1.1.1.2/VIAA/4/20/590.

PSIHOLOĢIJA

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PSYCHOLOGY

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CARERS (CARING FOR RELATIVES WITH MENTAL DISORDERS) PERCEPTION OF SOCIAL SUPPORT AND PSYCHOLOGICAL RESILIENCE

During the last thirty years there has been a growth in the scientific interest about the role of the care givers while taking care of their family members with mental disorders (depression and other severe diseases). It must be noted that in Latvia the awareness of the society on the significance of involvement of relatives in the treatment and care processes, caregivers daily stress, mental load, daily workload and responsibility daily has grown. The aim of the paper is present research materials about 28 caregivers and to investigate relationship between perceived social support, resilience of caregivers of family members with mental disorders, and to identify factors that are predictive of resilience. The results of the research show statistically significant positive correlation between perceived social support and resilience; it was found that the most predictive factor of "resilience" is perceived social support.

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COMMUNICATION PATTERNS OF YOUTH WITH FRIENDS IN THE SOCIAL NETWORKS

Social networks have become a way to keep in touch with acquaintances and friends. In the 21st century, social media is the backbone of youth culture. In Latvia, as well as throughout the Europe, young people use social networks such as Facebook, Instagram, WhatsApp, and in recent years, Tik Tok has also become popular among youth. The study conducted from 2019 until 2021 reveal the aspects of friendly relationships in social networks.

The survey involves 250 young people in the age group from 17 to 35. The aim of the study is to find out the quantitative and qualitative indicators how youth define friendship. The results suggest that social networks serve as a tool for keeping friendships in order to maintain existing friendly relationships. The number of friends in the social networks do not provide the necessary support that can be obtained via the Internet. Interaction within the social networks reduces relationships in real environment and does not replace interaction in real life situations.

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FREQUENT WORKPLACE CONFLICTS INCREASE SICKNESS PRESENTEEISM – RESULTS FROM POOLED ANALYSES IN LATVIA

Objectives. The objective was to investigate if the frequency of different workplace conflicts has an effect on self-reported sickness presenteeism.

Methods. Cross-sectional survey data pooled from four periodic national surveys “Work conditions and risks in Latvia” (2006–2018) were used. The studied outcome sickness presenteeism was defined as went to work while being ill.

A computer-assisted personal interviewing method for data collection of randomly selected respondents was used to obtain the sample representative to the working population of Latvia. The study sample (n=6368) consisted of hired workers between 16 and 80 (average 42.9 +/- 12.6), 47.1% males and 52.9% females. The association between frequency of workplace conflicts and presenteeism was analysed using binomial logistic regression with adjustment for gender, age, education, and survey year. Respondents who were not ill during the last year were a reference group.

Results. The odds of presenteeism significantly increased along with the increase in the prevalence of all types of conflicts, but most significantly with conflicts between managers and workers (OR=7.20 for often conflicts, 95% CI 5.14–10.09, OR=3.50 for occasional conflicts, 95% CI 2.78–4.42, OR=2.28 for rare conflicts, 95% CI 1.86–2.79). In general, the odds of sickness presenteeism for other types of conflicts increased four times – for often conflicts with customers (OR=4.03, 95% CI 2.85–5.70), between groups of workers (OR=3.86, 95% CI 1.90–7.87) and individual workers (OR=4.36, 95% CI 2.58–7.36), if compared with respondents not reporting the respective type of conflicts.

Conclusions. Any frequency of workplace conflicts is significantly associated with increased presenteeism, furthermore, more frequent conflicts are associated with higher odds. It is known that presenteeism is associated with lower productivity and future sickness absence, therefore the message on hidden effects of conflicts should be passed to employers to implement targeted preventive measures.

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PREVALENCE OF ANXIETY AS THE RESULT OF TELEWORK – RESULTS FROM THE SURVEY ON LIFE WITH COVID-19 IN LATVIA

Objectives. The objective of the study was to identify what circumstances and conditions have caused higher prevalence of anxiety in teleworkers in Latvia during the 1st emergency state resulting from the COVID-19 pandemic.

Methods. Survey participants were recruited with snowball sampling method and social media advertisements. In total, 1006 employees fully responded the questionnaire during 28.09.2020.–27.10.2020. After data cleaning, answers from 453 teleworkers who gave a certain answer on having anxiety were included in analysis. 116 (25.6%) were teleworkers with experience before COVID-19, 337 (74.4%) – without it. Data weights were made by age crossed with gender (in 12 age-gender combinations) and analysed with statistical software IBM SPSS, v26. The average age of respondents after weighting was 42.9 +/- 11.6 (min 22, max 72 years), 42.2% were males and 57.8% females.

Results. After data weighting, 35.9% of all teleworkers reported anxiety. Anxiety was more often reported by teleworkers without previous experience (81.9% versus 18.1% with no experience); teleworkers who needed training on stress reduction (55.9% versus 10.3% who have received it). Lack of employers' interest in the teleworking conditions also influenced prevalence of anxiety (41.7% respondents among those whose employer did not care versus 14.4% among those whose employers cared). Anxiety was more often mentioned among those whose employers did not compensate costs (e.g. internet, electricity) (58.9%) versus only 1.4% teleworkers whose employers compensated costs ($p < 0.001$ in all cases).

Conclusions. Prevalence of anxiety was influenced by insufficient involvement of the employer in organization of telework. Various measures taken by employers could help to reduce prevalence of anxiety, both directly (e.g. training on stress management) and indirectly (e.g. compensation of costs). As employers may not be aware of support, they could provide to teleworkers, their awareness should be increased.

SPORTS

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SPORT

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MOTIVATION OF RIGA STRADIŅŠ UNIVERSITY STUDENTS TO CHOOSE THE OUTDOOR PHYSICAL ACTIVITY STUDY COURSES DURING COVID-19

Key words: outdoor physical activity, students, motivation, choice

Research objective: to find out the motivation of Riga Stradins University (RSU) students to choose outdoor activity courses during Covid-19.

Materials and methods. A qualitative research method was used in the research – interview and content analysis of the results. Following the conditions set during Covid-19, the interview was conducted remotely during the academic year of 2020/2021. Participants of the study are RSU students who have chosen outdoor physical activity courses. During the interviews, There were clarified students' opinions, reasons and influencing factors for choosing study course during during Covid-19.

Outcomes. When choosing study courses outdoors, the most important aspects are mentioned by students as “opportunities for self and professional development”, “to learn in practice the specifics of outdoor physical activities: forms, methods, techniques, methodes”, “to spend time actively in the fresh air”, “to improve mood”, “to gain positive emotions”, “to feel good”, “energy”, “peace”. Students' answers show that physical activity improves not only physical, but also psycho-emotional well-being, accepting the importance of physical activity in maintaining and improving both physical and mental health. “Great physical activity, unique in its accessibility and ability to stay in good physical shape during Covid-19.”

Conclusions. The motivation of RSU students to choose outdoor study courses was partially and additionally influenced by Covid-19 time: practicing physical activities outdoors, in the fresh air in the “nature gym”, improving physical and psycho-emotional well-being, as well as further use of acquired competencies for public benefit.

**Layout of Manuscripts for the collection
“Proceedings of the 63rd international scientific conference of Daugavpils University”**

“Proceedings of the 63rd international scientific conference of Daugavpils University” publishes original papers, based on the presentations at the international conference, held in Daugavpils, 15–16 April, 2021. Proceedings of the scientific international conference of Daugavpils University are published electronically on www.dukonference.lv since 2010. It is not issued in paperback.

Language. All submitted articles need to be written in English (Latvian, Russian, German, Spanish, French, Polish, Lithuanian, Swedish – in the corresponding linguistic work groups of the humanities).

The rules for the paper setting:

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 - the full Title of the article (font size – 16; **bold**; Caps Lock);
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 - Institution, Address, e-mail (font size – 12);
 - Abstract in English and Latvian – 1500 characters (font size – 10; line spacing – 1);
 - Key words (5–6) should be in abstract language (font size – 10; *italic*);
 - Text of the article. The recommended length of submissions is 12 000 – 15 000 characters (font size – 12; line spacing – 1,5; margin – 2.0 cm). It is recommended to divide the body of the text into the following chapters (humanities and social sciences): *Introduction (the Aim of the Article, Material and Methods)*, *Discussion*, *Conclusions*, *Acknowledgement*, *References*. It is recommended to divide the body of the text into the following chapters (natural sciences): *Introduction*, *Material and Methods*, *Results*, *Discussion*, *Conclusions*, *Acknowledgement*, *References*.
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 - Remarks and explanations should be placed at footnotes;
 - References (font – 12, line spacing – 1).
- References and remarks:
 - References should be indicated in the text by giving the author’s surname with the publication year, e.g., (Turner 1990), and if from concrete page, e.g., (Turner 1990: 12);
 - if abbreviations are used in references (e.g. titles of dictionaries, etc.) they must be deciphered in bibliography but in the text reference just the volume and page

numbers may be indicated without mentioning the year of publication, e.g. (LKV II: 81);

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- 1) novelty of the theme and scientific level of manuscript;
- 2) style and compliance of key words and summary with the content of manuscript;
- 3) compliance with conventions for publication.

Sample

IMPROVEMENT OF QUALITATIVE RURAL LIVING ENVIRONMENT IN LATVIA IN LEADER PROGRAM FRAMES

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Abstract

Improvement of qualitative rural living environment in Latvia in LEADER program frames

Key Words:

Abstract text.....

Kopsavilkums

Kvalitatīvas lauku dzīves vides uzlabošana Latvijā LEADER programmas ietvaros

Atslēgvārdi:

Kopsavilkuma teksts

Body text.....

References

Breidaks A. 1996. *Augšzemnieku dialekta latgalisko izlokšņu fonētikas atlants*. Daugavpils: Saule.

Lawrence J. F., Newton A. F 1995. Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names). In: Pakaluk J., Slipinski S. A. (eds.). *Biology, Phylogeny and Classification of Coleoptera. Papres Celebrating the 80th Birthday of Roy A. Crowson*. Vol. 2. Warszawa, pp. 779–1006.

Drees C., Matern A., Vermeulen R., Assmann Th. 2007. The influence of habitat quality on populations a plea for an amended approach in the conservation of *Agonum ericeti*. In: *Baltic Journal of Coleopterology*. Vol. 7(1), Daugavpils, pp. 1–8.

Turner R. H. 1990. A Comparative Content Analysis of Biographies. In: Qyen, E. (ed.). *Comparative Methodology: Theory and Practice in International Social Research*. London, etc.: Sage Publications, pp. 134–150.

Strazdiņš I. 1999. Matemātiķi pasaulē un Latvijā. No: *Zinātnes Vēstnesis*, 8. marts.

TET 2011. *Types of Electronic Translators*. [skatīts 04.03.2011]. Pieejams (Accessed): <http://www.buzzle.com>

VPSV 2007. *Valodniecības pamattermiņu skaidrojošā vārdnīca*. Rīga: LU Latviešu valodas institūts, Valsts valodas aģentūra.

Soms H. 2009. *Vēstures informātika: Saturs, struktūra un datu bāze Latgales dati*. <http://www.du.lv/LD/LDpublik.html> [10.02.2009].

Шмит К. 1992. Понятие политического. *Вопросы социологии*, № 1, с. 37–67.

SATURS / CONTENTS

MĀKSLA / ART.....	5
BIOLOĢIJA / BIOLOGY.....	14
ĶĪMIJA / CHEMISTRY.....	27
DOKTORANTU SEKCIJA „LITERATŪRZINĀTNE” / DOCTORAL STUDENT SECTION “LITERARY STUDIES”	34
EKONOMIKA UN SOCIOLOĢIJA / ECONOMICS AND SOCIOLOGY.....	36
IZGLĪTĪBAS ZINĀTNES / EDUCATIONAL SCIENCES.....	42
VIDES ZINĀTNES / ENVIRONMENTAL SCIENCES.....	49
VESELĪBAS APRŪPES ZINĀTNE / HEALTH CARE SCIENCE.....	60
VĒSTURE UN KULTŪRAS VĒSTURE / HISTORY AND HISTORY OF CULTURE.....	109
TIESĪBU ZINĀTNE / LAW.....	115
MENEDŽMENTS / MANAGEMENT.....	125
MATEMĀTIKA / MATHEMATICS.....	128
MŪZIKA / MUSIC.....	129
FILOLOĢIJA / PHILOLOGY.....	134
FIZIKA / PHYSICS.....	139
PSIHOLOĢIJA / PSYCHOLOGY.....	142
SPORTS / SPORT.....	145
Layout of manuscripts for the collection “Proceedings of the 63 rd international scientific conference of Daugavpils University”	146

Anna Vanaga, Olīta Miglāne, atbildīgās par izd. / Resp. Ed. *Daugavpils Universitātes 63. starptautiskās zinātniskās konferences tēzes = Abstracts of the 63rd International Scientific Conference of Daugavpils University*. Daugavpils: Daugavpils Universitātes Akadēmiskais apgāds „Saule”, 2021. 149 lpp.



Daugavpils Universitātes Akadēmiskais apgāds „Saule”.

Izdevējdarbības reģistr. apliecība Nr. 2-0197.

Vienības iela 13, Daugavpils, LV-5401, Latvija.