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# RESEARCH PORTFOLIO

**SEMMELWEIS UNIVERSITY**  
**FACULTY OF HEALTH SCIENCES**

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## PSYCHOSOCIAL CHARACTERISTICS OF NEW PSYCHOACTIVE SUBSTANCE USERS

The number of new psychoactive substance users continuously grows in Europe and in Hungary. Traditional health and social care interventions do not work effectively in these cases so we have to develop new prevention and treatment methods, which necessitates a better understanding of substance use and users. A part of this task is studying the psychosocial characteristics of users and assessing their respective risk.

The users of the new psychoactive substances pose a challenge for the system of health and social services therefore it is important to know the psychosocial characteristics of users and of the patients undergoing therapy. Based on this information, we can plan more targeted interventions for them in terms of e.g. prevention, outreach, admission to treatment, and treatment planning.

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## EFFICACY STUDY OF A PREVENTION ESCAPE ROOM NAMED MIND-BREAKER

Mind-breaker is a prevention escape room that contains various interactive and cooperative tasks related to important life events of an imagined substance user, highlighting the risk factors for substance use and addiction. The players of the room (5-6 persons/game) enter a space that symbolizes the mind of a substance user. The game experience is followed by a group discussion session. The prevention escape room is freely available for adolescents as a preventive intervention.

The current study aims at assessing the efficacy of the escape room by collecting data shortly before (T0) and after (T1) the game experience. The main outcome variables consist of psychoactive substance-related knowledge, perceived self-efficacy, state anxiety and craving regarding the substance used most frequently by the respondent. The experimental group (those who enter the escape room) is compared with a group receiving a prevention lecture as well as with a control group that does not receive any preventive intervention.

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## ASSESSMENT OF STRESS MANAGEMENT AMONG STUDENTS

At the beginning of their university studies, the pressure significantly increases on students. They face difficulties in terms of fitting in, performance pressure related to obtaining the desired grades and the more intense exposure to stress, which may result in increased anxiety, stress, depression, fatigue, and burn out.

At a global level, the effects of stress on students and together with their negative consequences have reached a degree that students are increasingly exposed to the risk of depression, anxiety and burnout. According to the latest studies, 21-90% of students experience stress load and 27-75% of students experience burn out. 5-10% of students have suicidal thoughts. General exhaustion may induce additional health problems such as sleep disturbances, blood pressure fluctuations or other psychosomatic symptoms.

The purpose of our research is to assess students' overall psychosocial and health psychological state, identify stress factors, analyse the effect of the distress generated by the exam situation on students' psychological and mental condition, and test results. Our goal, furthermore, is to explore approaches that are more effective in dealing with stress, to emotion management and to coping, and to identify all mobilisable resources for students' wellbeing. We intend to develop and study the effect of psychosocial interventions that can effectively help students cope with stress, achieve good exam results and reduce dropout.

In our study, we plan to create a sample involves about 400 students across all university programmes of the Faculty.

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## THE INSPECTION OF RISK INTERVENTION POSSIBILITIES FOR OLD-AGE SARCOPENIA, WITH PARTICULAR EMPHASIS ON HMB COMPLEMENTATION AND ELECTROMAGNETIC FIELD MANAGEMENT

Elderly people (over 65 years of age) face increasing nutritional difficulties. Generalized muscle strength and muscle mass loss, also known as sarcopenia, may be associated with a higher risk of falls in old age, reduced physical performance during daily activities, hospitalization and mortality. Most research into the prevention or treatment of sarcopenia requires complex nutritional and physical interactions. HMB (beta-hydroxybeta-methylbutyrate) is a metabolite of one of our branched chain amino acids (leucine). Meat, fish, dairy products, soy, other legumes and oilseeds are the main external food sources of leucine. Due to its anabolic, muscular, and aerobic endurance, HMB is rapidly gaining popularity among athletes, but it is now almost certain that it is an effective supplement, especially in untrained people. Loss of muscle mass can occur as part of physical inactivity, disease, lifestyle, or a natural aging process. One of the possible causes of sarcopenia is the anabolic resistance of the aged muscle to food stimulation. Salto et al. also assume a positive effect of HMB supplementation on cognitive function. It is presumed that HMB supplementation initiated in adulthood may play a preventive role in the maintenance of cognitive function. Investigation of the effect of HMB supplementation on cognitive function in human models is limited, although the preconception of its efficacy is enhanced by the fact that HMB crosses the blood-brain barrier. Sansa electromagnetic field therapy as a therapeutic method has shown positive results in plastic surgery, both in the treatment of edema and pain, in the healing of chronic wounds, in lower back pain and in the reduction of knee joint pain as well as in the healing of bone fractures. In our research, we use self-questionnaires, Sansa electromagnetic treatment, HMB supplementation, and locomotor and dietetic surveys.

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Anorexia nervosa (AN) has the highest mortality rate among psychiatric disorders at the moment. Its leading symptom is body image disorder. The correction of body image disorders in a therapeutic setting is difficult, sometimes not even addressed, and as a consequence the relapse rate in eating disorders is significant. Body image disorders usually precede pathological eating habits; its diagnosis is of utmost importance. The situation is made more difficult due to the earlier onset of eating and body image disorders thanks to the ever stronger media influence.

There are many methods to measure body image disorders, however, these are mostly questionnaires. Computer-based techniques became available in the last 3 decades, which are able to measure both the perceptual and the attitudinal component of body image. These methods, however, are not yet widespread. The advantage of these methods are that they are immersive, detailed, and they do not require specific equipment other than a computer or a tablet.

One goal of my research is to validate computer-based methods that will be available for practitioners in clinical settings. Presently there are more than one 3D graphic modeling softwares that are perfect for body image measurement, however they are not used for that purpose. As my research I aim to validate the DAZ 3D Studio program, so that I could provide a statistically reliable and valid measurement for clinicians. Moreover, I would like to explore the possibilities provided by the detail-oriented nature of these softwares; body image might not be as homogenous as we have thought earlier – not referring to the perceptual and attitude component – since due to the simultaneously present body image ideals and media messages different body parts might actually carry different significance. Exploring the nature of body image this way might provide valuable insight and contribution to improve the care of eating and body image disordered patients.

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**Theoretical background:** Individual assessment and experience of the concept and dimensions of subjective well-being is an essential basis for quality of life, thus positive psychological tendencies often research its background. Lack of life's meaningfulness can lead to several mental and psychosomatic disorders in the individual, which is why it may be important to examine the attitude of generation Z to their micro- and macro-environmental challenges, their life satisfaction, lifestyle and certain components of their quality of life (health, satisfaction, wellbeing, goal setting, etc.). Psychological well-being can be interpreted on two main axes: hedonistic well-being, which is mainly determined by the feeling of happiness and positive affinity as well as eudemonic well-being, which focuses on the existence of life goals and its cognitive elements. A higher level of subjective well-being carries personality traits and capabilities such as friendliness, productivity, acceptance, openness, activity, thus it can be very useful not only for the individual but also for the society. Subjective well-being and life goals are determined by many genetic, socio-cultural, educational components, so responses to the questionnaires may reflect parental and social expectations instead of the individual's real desires and future plans.

**Method:** This article reports the findings from a questionnaire survey of 163 university students' life satisfaction in Semmelweis University of Budapest. The survey was conducted in 2018/19 using three questionnaire tools. The method was snowball-based and randomized. In each of the three questionnaires respondents had to indicate their values on a 7-point Likert scale. We used the Hungarian validated adaptation of Diener, Emmons, Larsen and Griffin's Satisfaction with Life Scale, Crumbaugh and Maholick's Purpose in Life Test and a self-made 6-item questionnaire about subjective health, happiness and well-being. We used descriptive statistical methods in SPSS for data analysis.

**Expected results:** According to the hypotheses, high results of PIL may be mainly moderated by the living conditions factor. We expect a positive correlation between happiness-health, purposefulness-happiness, responsibility-life-sense, purposefulness-joyfulness, satisfaction-diversity factors. At least 30% of the participants will consider their life ideal (a value of 6 on the 7-point Likert-scale) and at least 10% of them would make no difference to their current lives. Results of the t-test will be significant between the correlation of place of residence and subjective well-being: students raised in Budapest may feel less happy and less healthy compared to their rural mates. We expect a demonstrable correlation between parents' schooling and tendentiousness and between gender and age subgroups in life satisfaction, however no significant difference can be assumed.

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### THE POTENTIAL THERAPY OF MOTION DISORDERS BY WHOLE BODY VIBRATION AT EARLY DEVELOPMENTAL STAGE

In our fundamental research program, attention deficit hyperactivity disorder (ADHD) and a potential therapy of it is studied. Previous experiments have established an animal model of ADHD. In this model, the physiology of animals, especially of their brains, can be intensively studied, which is impossible or difficult to perform on human subjects. The basic symptoms of the disorder will be presented on the animals (Wistar rats): hyperactivity, attention deficit, impulsivity and accompanied cognitive and social disturbances. Animals will be exposed to whole body vibration (WBV) at different stages of development and the improvement of symptoms will be tested. Then the positive effects of WBV will be examined on 7-12 year-old children diagnosed with ADHD.

In the followings, the WBV treatment will be applied on children suffered in cerebral palsy as well as in muscle dystrophy.

Our long-term goal is to present the advantages of a simple, non-invasive treatment, and to improve the condition in the mentioned motion disorders.

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## EFFECTS OF ENDOCANNABINOID SIGNALING ON VASCULAR FUNCTIONS AND REMODELING

It has been known that endogenously produced cannabinoids (endocannabinoids) play a role in the physiological functions. It has also been known that consuming exogenous cannabinoid-derived drugs may induce alterations of cardiovascular and hormonal system. Effects of endocannabinoids in the nervous system and other tissues are mediated mostly via CB1 cannabinoid receptors (CB1R). We have reported before that CB1Rs influence vascular control mechanisms in some vascular beds.

Thus we aim to investigate the roles of endocannabinoid system and CB1 cannabinoid receptor signaling on the vascular functions and remodeling induced by pathological states (e.g. hypertension, hormonal and metabolic diseases).

Research experimental work is performed in the Laboratory of Molecular Physiology, Department of Physiology of Semmelweis University. Blood pressure of rats and transgenic mice (CB1R knockout) is measured and functions of vessels are measured with myography. Vascular remodeling is detected by tissue staining methods.

Beneficial outcomes of the research project targeting endocannabinoid system and cannabinoid signaling may reveal physiological mechanisms and give a therapeutic potential.

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## EFFECTS OF METABOLIC AND HORMONAL DISTURBANCES ON VASCULAR ADAPTATION AND REMODELING

The research project investigates pathomechanisms of changes in hemodynamic and vascular functions in metabolic and hormonal disorders (e.g. diabetes mellitus, hypertension, menopause, polycystic ovary syndrome). During the research work we aim to investigate the role of the alterations of hormone receptor-induced signaling mechanisms in the progression of these diseases. We also aim to suggest pharmacological intervention attenuating pathophysiological alterations of vascular functions and vascular remodeling by modulating cell-signaling mechanisms.

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## MAINTAINING OF FUNCTIONAL ABILITIES AND PREVENTION OF FALLS AMONG OLDER ADULTS

We conduct controlled studies to investigate whether different types of physical activity and other preventive programs could be feasible exercise forms for Hungarian older adults too. In addition, we evaluate the short-term and long-term effects of these programs on balance, functional mobility, and kinematic variables of gait, lower limb strength, and aerobic endurance in this population. Furthermore, we assess the factors which influence functional abilities in older adults. Outcome variables including static and dynamic balance, kinematic parameters of walking, functional mobility, lower limb strength, and aerobic endurance are measured with standard clinical tests or biomechanical tools. Between and within groups changes and associations will be analysed with statistical tests depending on data quality.

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## A MODEL OF THE VENOUS VARICOSITY DISEASE IN RATS

It is important to know the effects of pressure and flow on the biomechanical changes in the venous wall and on its collateral vessel network for understanding the pathomechanism of venous varicosity. A new animal model was introduced, in which a part of the saphenous vein of rats was partially occluded (4 weeks, pressure increased, flow decreased). Notable angiogenesis and varicosity-like distensions of the side branches were observed after the occlusion. The changes proportionally enhanced with the duration of the occlusion (8-, 12 weeks). The occlusion was combined also with gravitational load (4 weeks, 45° head up tilt position in a tube-like cage). As a result, tortuous vessel segments and significantly enhanced collateral vessel network developed even after 4 weeks. Our further aim is to elucidate the extent of angiogenesis with immunohistochemical markers (f. e. KI-67 (cell division activity), CD 68 (macrophage activity), SMA (smooth muscle actin, angiogenesis), rezorcin fuchsin dye (elastic fibers)).

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## ROLE OF PHYSICAL ACTIVITY (SPORT) IN PREVENTING VASOMOTOR AND COGNITIVE DYSFUNCTION DURING AGING

It is known that mental / cognitive functions are diminishing with aging. It has also been shown that increased physical and mental activity significantly reduces cognitive aging. This is due to the improved functioning of the cardiovascular system, especially cerebrovascular circulation and its (auto) regulation. Today, the phenomenon the “so-called vascular dementia” (such as forgetfulness) has been recognized, that is the mental decline is due to pathological functioning of cerebral vessels. In the course of our research, this idea is continued by examining the vasomotor function of arteries isolated from the brain of the exercised (EX), compared with the sedentary (SED) rats (young and old, male and female), and correlations will be established among these groups regarding vascular and mental / cognitive function. This research is an extension of our previous research in a similar field. The following specific experiments are planned:

### **Animal studies:**

1. Studying the vasomotor function of cerebral vessels, correlated with the aging of the brain, the cognitive and psycho-motor performance of elderly rats. Functional (vascular changes, agents with known mechanism of action), morphological (such as, wall thickness, enzyme detection, immunocytochemistry and histochemistry) and biochemical (Western blot, PCR) parameters are measured. The focus includes endothelial (NO, PGs), smooth muscle (contractility), and neuro-vascular coupling factors, such as neurotransmitters. Measurement of synaptogenesis and functions under the control of BDNF, PACAP, serotonin, etc., which are crucial for the regulation of learning and sensory motor processes. Later, we are also planning age-related changes. Age will be studied: 3, 12, 24 and 30-32 months.

2. We assume that the following "interventions", "influences", which can be used in clinical practice, improve positively both the vasomotor function of the cerebral vessels and the mental functions of the rats. There are two types of effects that have clinical significance: active and passive exercise types.

#### *Active:*

- a) rat treadmill: chronic moderately intense therapy (which meets the requirements of the human age),
- b) rotarod: improving chronic learning and balancing skills and progressing as the workout progresses,
- c) 'enriched environment' which improves the psychosocial environment
- d) a combination of the above

#### *Passive:*

- a) Whole body, pulsed electromagnetic field stimulation (EMT pacing)
- b) Whole body vibration
- c) Acute or chronic age dependent



**Human Studies:**

Examination of forearm and foot skin microvascular reactions (with Perimed Laser Doppler Flowmeter) in various conditions of young and old subjects and the effects of passive and active exercise treatments.

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## THE SOCIO-ECONOMIC STATUS OF NURSES

The aim of our research is to get a complex picture about the socio-economic status of Hungarian nurses, along with an understanding of the causes, backgrounds, and expected consequences of their situation. Our plans include making reliable and standard comparison with other reference-groups and with nurse communities of other countries as well. We will examine all dimensions and components of their social status, since we suppose that – just as in other social groups – the particular status-characters are consistent with each other and at the same time, the status-inconsistency appears in the nurse-group as well. To represent the socio-economic status of nurses solely through their income level would be a serious oversimplification. On the contrary, in our research we examine this in 21 dimensions. The causal system, interdependency, and generative correspondence of both subjective and objective indicators of the social status are in the focus of our research.

The complexity and the multidimensional character of our study require several research methods, including survey and focus group inquiry.

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## SOCIO-CULTURAL PATTERNS OF HEALTHCARE SPECIALISTS' WAY OF THINKING, ACTIVITIES AND COMPETENCIES IN CARING FOR ILL PEOPLE IN SPECIAL LIFE-SITUATION

Healthcare professionals more and more often meet patients who are in special a life-situation. These situations are sometimes the causes of the development of their illness or their patient status, while in other cases they merely accompany the specific life situation. The amount of special life-situations is increasingly growing during the postmodernization of the societies. Due to the differentiation and divergency of social life and to the postmodern social way of thinking, there are more and more identified positions that allow or call for such a denomination.

The social, socio-demografic and socio-cultural position of the healthcare professionals, the special ethos and the normative millieu of their work and profession, as well as the significant stress on their social responsibility taking pose several questions. These include the following: what kind of predispositions they have when facing these special life-situations, what kind of cognitive and behavioural strategies they work out for integrating these aspects into the structure of their work and proficiency, and how they construct their life-world in a healthcare providing segment that is increasingly gaining importance.

The diversified thematic structure and multidisciplinary horizon of the research necessitates the application of various research methods from questionnaire-based survey researches across focus-group researches to the content-analyzes of healthcare documents are necessary.

The results of the research can contribute to the improvement of the community and professional support provided for healthcare workers, to the modernization of their studies, and to increase their work-efficiency.

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Human resources for nurses or recruiting nurses raises not only a qualitative, but also a quantitative issue. Not only is the extremely topical question of where the health care system recruits the required supply of professionals, but also what qualitative indicators this echelon has in the helping role in which the profession is classified.

The knowledge of nurses, including general literacy, professional knowledge, and last but not least the relations connected to gaining the knowledge (as Bourdieu calls it *habitus*) is an extremely complex, multidimensional factor, which diversely defines the casual links. The research explores the origin of nurses' habitus, its patterns of evolution, structural and functional nature, adaptability, recognition for the work performed and convertibility into the other types of capital.

Applying Bourdieu's field-theory, we examine the sociocultural context dealing, interpreting and evaluating this habitus, in other words, the network society, which defines the origin and development of the examined habitus.

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## THE RELATION OF ROMAS AND THE HEALTHCARE SYSTEM FROM AN INTERDISCIPLINARY APPROACH

The research applying both sociological and legal aspects aims at identifying the main factors determining the relation of Roma women and the healthcare system. In the qualitative research, we conduct focus group interviews with midwives and health visitors about Roma women's situation in terms of family planning, prenatal care, birth, and infant nursing. We would like 1) to describe the main conflicts and actors in the relations of Romas and the healthcare system; 2) to address the difference between the Roma and non-Roma patients in terms of their sociodemographic characteristics, health behaviour, health awareness, and cultural background; 3) to explore the difference between Roma groups based on the former aspects and 4) to reveal the attitude of the majority of the society to the Roma, from the point of view of the institutions, healthcare workers, and non-Roma patients.

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## THE PHILOSOPHICAL HERMENEUTICAL UNDERSTANDING OF INTERCULTURALITY AND ITS CONSEQUENCES ON HEALTHCARE

This research aims at investigating what promises could be identified in deepening the discussion on interculturality by the help of the conceptual framework of philosophical hermeneutics as it was articulated by Hans-Georg Gadamer and Paul Ricoeur. Further to that, it aims to reveal opportunities this inquiry may reveal for the healthcare sector. By analysing the well-known intercultural models in health care delivery, the research would like to foster prevention and resolution of conflicts driven by the relation of parties with different cultural identity.

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## ETHICAL AND LEGAL DILEMMAS IN THE PRACTICE OF PERINATAL INTENSIVE CARE, FROM THE POINT OF VIEW OF THE BEGINNING AND THE END OF LIFE

The general goal of the research is to shed light on the formation of the social and professional identities and roles of medical and health care professionals working in perinatal intensive care. Furthermore, we aim to understand the coping strategies these professionals use when facing communicational, professional, personal, and social challenges. At the same time, we concentrate on the effects of brand new technological solutions in the everyday medical practice of the field.

Our research focuses on those critical points where the related ethical and legal norms no longer correspond with professional and personal values. Due to these conflicting argumentations, several questions arise about the beginning and the end of life.

We want to show the nature of the conflicts stemming from the differences of legal and moral horizons and their effects on the everyday practice of perinatal intensive care.

With our findings, we try to support the more effective usage of highly developed professional solutions and the cooperation of the various professional and lay groups involved.

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## MODERN PEDAGOGICAL APPROACHES TO HUNGARIAN HEALTH PROMOTION BY PEER EDUCATION; LEARN-TEACH-KNOW (TANTUDSZ)

The primary goals of our research project supported by the Hungarian Academy of Sciences are to increase health-consciousness among the youth and to enhance the effectiveness of school health programmes with the detailed elaboration and launch of a new pedagogical methodology (Learn, Teach, Know!) in Hungary.

This methodology will be based on scientific evidence (Evidence-Based Education, EBE) and put into international context. The main point of our pedagogical concept is to involve older student age-groups to younger children's health education in the framework of a professional tutorial system. Modern and innovative health education is a complex pedagogical challenge and it involves numerous scientific fields (biology, health pedagogy, psychology, health sociology, information technology, etc.), so it is impossible to restrict it merely to the field of social or natural sciences. That is why the aims of our project are multidisciplinary. The members and experts of our programme belong to various science fields and professions and the connecting thread among them is the health education of children and youngsters.

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## INTEGRATION EXPERIENCES OF PARENTS OF SCHOOL-AGED-CHILDREN WITH AUTISM SPECTRUM DISORDER IN A LOCAL EDUCATIONAL CONTEXT

Social and symbolic boundary-processes related to disability experiences are put in a particular ray of light by the perspective of families raising a kid with a disability. The boundaries that define family itself are re-understood in relation to disability, as caring of a disabled child supposes a social network of relationships of educators, health and social care professionals, informal actors (such as neighbours, friends) as active agents of the everyday life of the family. Based on the social model of disability, disability is situative because all the family members around the disabled are sharing experiences of disability: even though family members may acquire different perspectives, experiences, tasks, understandings, the family in its unity experiences disability. The different formal and informal actors helping the family may reacting differently to the needs of the family and creates their narratives about it in different ways too. The central focus of this research is on families raising kids living with autism. It concentrates on the relevance of the developed family-school interface on the experiences of inclusion of these families. In doing so, it explores the discourses of the local society and school about autism, inclusion/exclusion that forms the educational strategies of the parents also. Therefore, the local social-cultural-economic context has to be discovered too, because it forms many phenomena, including patterns of interactions about school disadvantages or disabilities.

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## IMPACT OF THE COVID-19 PANDEMIC ON DOMESTIC HEALTH RESORTS - COMPARATIVE RESEARCH WITH SANATORIUMS IN RUSSIA

The aim of the research is to examine how the situation caused by the COVID-19 pandemic was handled by Hungarian and Russian health resorts, and whether their supply was adapted to the situation caused by the pandemic. It is a very new subject in medical tourism – the corona recovery concept in medical spas and climate health resorts. The goal is to use the historical, scientific tradition of balneology and current modern technology at COVID-19 recovery programme. Balneology has been the elementary source of rehabilitation and optimization of the human immune system and healing in times when the present modern medicine has not been yet born.

Russian Federation, like Hungary, is rich in natural healing factors. Russia managed to preserve and even actively develop sanatoriums, where medical services are provided under medical supervision. In many ways Russian professional activities can be considered as good practices. That is the reason why Russia was chosen to this comparative research.

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Numerous research has reported on the difficulties of communication in multicultural, multilingual healthcare settings, which often lead to misunderstandings and miscommunication exerting a negative impact on patient care, such as serious harm and preventable adverse events. Therefore, experts emphasize the necessity of clear communication, which can only be established if healthcare institutions have a policy and system for managing multicultural, multilingual cases, their healthcare staff is trained, and professional language services are available.

The aim of the research is to explore what tools the main European health systems have to manage cultural diversity and overcome language barriers in order to prevent minorities and patients not speaking the local language from experiencing inequalities and disparities and provide them with safe and quality care.

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## WELL-BEING INVESTIGATION OF PERSONS WITH DEMENTIA IN HUNGARY AND SWEDEN: QUALITATIVE INTERVIEW RESEARCH FROM THE PERSPECTIVES OF THE RELATIVES

**Introduction:** Dementia is one of the leading challenges of the aging societies of the 21<sup>st</sup> century, which is a featured problem in the European Union, including in Hungary and Sweden. One of the corner stones of caring for a person with dementia is maintaining his/her well-being, which cannot be measured due to the nature of the disease. The theory of person-centred care and symbolic interactionism emphasizes the focus on the attitudes of relatives, which can be used to examine the nursing-care approach of a person with dementia, including the observation of patient well-being.

**Objectives:** Analysis of the perceptions of the well-being of relatives of people with dementia living in elderly care institution in Sweden and Hungary. The research has a touch of ethnographic approach and uses phenomenographic qualitative research analysis with the help of individually edited help questions that leads to semi-structured in-depth interviews.

**Method:** As a data collection tool, we apply five to five deep interviews that will be conducted in each country with a pre-selected method for relatives at a pre-arranged location. Interview swill be made by using an interview guide and lasts approximately 30-40 minutes. The interviews in both countries will be recorded, transcribed and the Hungarian material will be translated to Swedish. The material will be shared with the help of an excel spreadsheet via Dalarna University's cloud (coded storage) and will be analysed using the data analysis method of phenomenographic research.

**Conclusion:** The research will hopefully contribute to the rise of attention of care and nursing approaches for people with dementia. It could draw attention to the dignity of people who suffer in dementia and the interrelationships between aspects of their care and well-being. It highlights the importance of person-centred care and the need of support for relatives. The bilateral nature of the research emphasizes the international path of dementia and may contribute to the modernization and cost-effectiveness of future social care in the European Union and and to the development of university-level nursing training.

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The European Union regulated the cuts and needlestick injury prevention issues, methods in 2010, which the domestic legal system adapted in 2013.

We performed four investigative researches into the Hungarian situation with regard to needlestick injuries among health care workers in the period 2006-2018. The objectives of the previous study were twofold: to reveal the trend in the extent to which health workers are affected, and to draw the attention of economic and professional decision-makers to the importance and currency of the issue.

The aim of current study is to explore what changes have occurred over the past five years in the practice of care, the incidence of needlestick accidents, the orders of accident reporting procedures and in the attitudes of healthcare workers as well as in the methods and tools used.

The results of the research are basically for the development of professional trainings for workers, which are organized on a yearly basis to prevent needlestick and cut injuries, to prevent accidents, to apply preventive mechanisms to be followed, and to learn about post-accident work and good practice. At the same time, we intend to use the research results in the development of curricula at nursing education at BSc and MSc.

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Tallinn Health Care College with its international partners Turku University of Applied Sciences TUAS, Escola Superior de Enfermagem de Coimbra ESEnfC, Istanbul University, Semmelweis University carries out the Erasmus+ Programme project „Care of Pressure and Venous Ulcers in Simulation Environment“, code of the project 2018-1-EE01-KA203-047119.

The aim is to carry out the project in collaboration with the international partners resulting in an evidence-based e-learning online course in the simulation environment within 3 years. The course consists of two parts: e-learning and practical tasks in the simulation environment. The e-learning part consists of online training materials and self-assessment tests, which enables the acquisition of theoretical knowledge. The practical tasks enable students to demonstrate the knowledge and skills when solving the tasks related to chronic wound care. The following topics are covered within the course: options for the prevention of chronic wounds, the causes, assessment, care of the ulcer and choice of ulcer plasters. Another aim is to develop collaboration between the institutions of higher education and raise cultural awareness.

Simulation as a modern innovative method has become increasingly popular in all areas of training for health professionals. Being familiar with and using this modern teaching method is essential in the education of future health professionals. The research aims to provide healthcare professionals involved in the training of educators, healthcare professionals and teachers with the opportunity to learn and apply this very popular, innovative and effective teaching technique. It is particularly important to examine how this innovative educational technique can be incorporated into the training and further training of health care teachers and nursing professionals.

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## PSYCHOLOGICAL EFFECTS OF HOSPITAL CARE AND NURSING INTERVENTIONS ON CHILDREN AND NURSES

In recent years, there has been a shift in attitudes towards childcare in Europe and worldwide, and the concept of 'child-friendly care' is widely used. There have been significant changes in this area in Hungary in recent years as well, and efforts have been made in several places.

Child Life Specialists work with children and families in hospitals abroad to help them meet the challenges of hospital care, illness and disability. They provide children with age-appropriate preparation for medical and nursing interventions, pain management, and play and self-expression.

The aim of our research is to develop a healthcare system in the field of hospital care for children in Hungary and to develop a new educational area that is already internationally recognized and has proven to be positive. The work of these child life specialists has been proven to reduce the fear and stress associated with hospitalization in children. In this way, it facilitates easier nursing work with children, reduces the failure rate of interventions, reducing the need for nursing stress and the attendant mental processing.

In addition, I would like to prove in the departments requiring higher emotional work, the increased psychological strain of domestic nurses, the development and consequences of secondary traumatic stress.

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**Introduction:** The increase in the prevalence of diabetes mellitus is a worrisome trend affecting the entire world. The focal point of a robust and well-functioning primary care system should be primary and secondary prevention. In contrast, Hungarian healthcare personnel have little time to spend on preventative efforts and thus diabetes and pre-diabetic states are not diagnosed in time.

**Objectives:** The aim of this study was to implement a two-stage diabetes-screening programme in a severely disadvantaged municipality. In the first stage, diabetes risk assessment was carried out in the 18 to 75 age group, followed by screening of the highrisk population for potential carbohydrate metabolism disorders using laboratory tests.

**Methods:** Stage 1: assessment of diabetes risk with the FINDRISC questionnaire; Stage 2: identification of carbohydrate metabolism status by oral glucose tolerance test and glycated haemoglobin test in patients at elevated or high risk of diabetes.

**Results:** 406 individuals completed the FINDRISC questionnaire. Elevated or high risk for diabetes was confirmed in 129 individuals (31.77%). There was significant correlation between increased risk and age ( $p=0.000$ ) and between increased risk and body mass index ( $p=0.000$ ). Based on the oral glucose tolerance test, 28.3% and 9.43% of the patients were diagnosed with pre-diabetes and diabetes mellitus, respectively. According to the glycated haemoglobin test, the incidence of pre-diabetes and diabetes was 50.94% and 11.32%, respectively. The strongest predictors of prediabetes/diabetes mellitus were age ( $p=0.047$ ) and positive family history ( $p=0.089$ ). The correlation between pre-diabetes/diabetes mellitus and smoking ( $p=0.635$ ) and physical activity ( $p=0.975$ ) was the weakest.

**Conclusions:** Our results highlight the necessity for improving preventative care. Based on the risks of significant mortality and disability due to diabetes, prevention and early diagnosis must be prioritised in primary care. In addition to the oral glucose tolerance test, measurement of glycated haemoglobin is also indicated, while keeping in mind the limitations of its diagnostic value. The longterm benefits to public health should be prioritised over the cost of screening tests.

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The prevention of healthcare-associated infections is a multifaceted task. The real results can be achieved with a complex approach only, involving the relevant disciplines (technical or health science). In contrast to the previous, predominantly environment-oriented approach, recently we are talking about infection control activities, in which, traditional methods continue to play a role, necessarily. Currently, the basis for examining the effectiveness of the certain procedures and protocols is mostly provided by culture testing following environmental or personal sampling, or merely visual inspection. Nowadays, an innovative solutions have been accepted as the Semmelweis Scanner, which provide opportunities primarily in the field of education and further training, especially in the field of improving the protocol and the movements of hand disinfection. In contrast, in the practice the measurement of effectivity is still carried out by traditional methods of microbiological analysis. Although, these are essential procedures that provide a lot of information, their disadvantage is that we do not receive immediate feedback on the examined area, and therefore, the possibility of correction is extended. The application of the lumitester instrument in nursing practice can be an advantage, especially due to the time and cost implications of microbiological methods. In the bioluminescence-based method, the products of the enzymatic degradation of adenosine triphosphate (ATP) and adenosine monophosphate (AMP), luciferase and pyruvate phosphate dikinase, are detected

Within the framework of our multi- and interdisciplinary research, we want to investigate the application possibilities of bioluminescence in an active patient care environment. The study focuses primarily on high-risk elements of nursing activities in terms of infections, including milieu and surfaces where the possibility of biofilm formation arises, playing a role in the development of colonization or infection. The analysis of the samples is quantified with mathematical operations and characteristic intervals that can be performed with quantified data.

The main area of application of our research is education, with a special emphasis on the joint program that can be implemented in connection with the training of nurses and public health inspectors. In any case, education must play a major role in achieving safe patient care. Thus, bioluminescent monitoring devices could be used to a large extent in the effectiveness of the teaching of (hand) hygiene good practice, within the framework of the projects of the two specialization.

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When the WHO and the International Council of Nurses declared 2020 the International Year of the Nurse and the Midwife, it was not suspected at all that the world's attention was focused on health care and health care professionals so much. It all happened because of the COVID-19 pandemic. However, attention to another pandemic, HIV / AIDS, remains much lower.

The topic of HIV infection / AIDS is one of the common link between the nursing and midwifery professions. Representatives of both professions have / would have a part in providing information on how HIV spreads and how HIV does not spread. The role would be common in supporting HIV prevention and promoting medical confidentiality. Both nurses and midwives have a common moral and ethical responsibility in dealing with fear, stigmatization, isolation, marginalization, and discrimination. The responsibility is also shared in shaping attitudes. Furthermore, both nurses and midwives are at risk of HIV infection, due to their work. Therefore, the monitoring and ensuring the post-exposure prophylaxis (PEP) and precautions have paramount importance for nurses and midwives.

Through their trainings, nurses and midwives become competent in caring for problems associated with HIV infection and the students are aware of the used medical treatments, cART therapy, and the specifics of caring for HIV-infected pregnant and their newborns.

Keeping the possibilities of multi- and interdisciplinary pedagogy in mind, we intend to carry out joint researches on the topic of HIV/AIDS with the involvement of students from the two specializations. The results of these researches focus on education, with special emphasis on joint professional programs in nursing and midwifery and the development of topic-specific knowledge too.

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Nowadays, blood safety and hemovigilance remain a top priority issue in healthcare in Hungary and internationally.

The importance of the topic is clarified by the domestic and international practice, as well as the domestic and international legal aspects, guidelines and strategies affecting patient safety, covering the entire process of the transfusion chain.

In the previous years, a nationwide survey was conducted on the topic of transfusion-related knowledge of Hungarian nurses and their role in blood safety. The further research is the continuation of a survey of nurses. The new research aims to fill the gaps in the medical, professional aspects of transfusion therapy. As part of the research, a survey will be conducted among physicians and healthcare practitioners on the topic of clinical transfusiology on local habits, knowledge, attitude, and administrative and/or technical errors in the practice.

A further aim of the research is to highlight on the practical problems of transfusion therapy due to a lack of knowledge, in order to outline the extent and form of further improvements in transfusion therapy in courses in order to effectively reduce errors, mistakes in the practice.

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**MONITORING THE NUTRITIONAL STATUS AND NUTRIENT INTAKE VALUES OF THE ELDERLY. ELDER EDUCATION FOR INFLUENCING NUTRITIONAL ATTITUDES**

More and more attention is paid to the nutritional status and testing of nutritional problems that affect the development and quality of life of the human body from conception all the way to old age. The problem occurs not only in developing but also in developed countries. Therefore, the study of the dietary habits and nutritional status is in the centre of focus even here.

The target group will be elderly people. The assessment of nutritional status will be made with BMI (body mass index) and with bioelectrical impedance analysis equipment (InBody 170/770). For the malnutritional risk screening Mini Nutritional Assessment (MNA) method will be used. The dietary assessment methods will be examined with the help of 3-day records, 2x24-hour recall. The nutritional attitude will be tested with Likert / Osgood scale. The data processing will be performed with "NutriComp Sport" programme. The evaluation of the data (descriptive statistics, significance analysis, correlation test) will be done with SPSS statistical and Excel program. In our country, primarily cross-sectional studies have been carried out so far, thus the novelty of his study is its longitudinal investigation.

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## THE HYGIENE OF FORMULA KITCHENS, ACTIVITY PROCESS MANAGEMENT AND ITS INFORMATION SYSTEM

In hospitals that supply infants, formula kitchens operate attached to the infant care units. There are no guidelines on how to operate these kitchens and how to regulate the ongoing activities. Since hygiene is of key importance in such places, in the hygiene manual of the institution these questions - regarding food preparations, breast milk collection, the preparation of the possible complementary foods - should be discussed. The aim of our research is to assess whether healthcare institutions regulate the above- mentioned activities to any extent. Based on the results, we would like to make recommendations for universal criteria that would fit in the good hygienic practice.

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## HEALTHY FUTURE – SUSTAINABILITY IN PUBLIC FOOD

The social, public health and nutritional significance of public catering is becoming the center of attention today, and there is an increasing expectation in consumer, economic, political and social terms. However, the responsibility of public catering is not just about shaping the public's health, responding to the objective and subjective needs of consumers, it is not just an economic question, but also its impact on the environment is becoming more and more important in many countries in terms of sustainable development. Sustainability is a process of development (land, cities, production processes, societies, etc.) that "satisfies the needs of today without reducing the ability of future generations to meet their own needs" (United Nations Organization 1987 Brundtland report). In the course of our research, we examine the ways in which the various catering establishments can help to realize this.

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## THE ROLE OF PUBLIC CATERING – AS ONE OF THE FORMS OF NUTRITIONAL BEHAVIOUR EDUCATION – IN THE FORMATION OF NUTRITIONAL HABITS

Overweight and obesity -as civilization diseases- are among the potential causes of chronic, non-infectious diseases. These include cardiovascular diseases, malignant tumours, and last but not least, diabetes and its complications. Public catering is the organized nutrition provision system for persons of various ages, genders and professions, with varying health status. During my work I would analyse public catering as a form of organized nutrition from the perspective of complex health science. Thus, the analysis of the investigation results would designate the desirable direction of necessary changes. My goal is to perform the mapping of the present public catering practice, the detection of errors, defects, and the identification of the positive features.

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## ERGOGENIC NUTRITION OF ATHLETES, IMPACTS OF DIETOTHERAPEUTICAL INTERVENTIONS AND TRAININGS ON THE ORGANISM

Examination of the various categories of athletes from the points of view of sport-physiology and body compositional parameters, sport performance and changes in these data. Investigation of the effect of dietary supplements on the body from the point of view of their possible impact on the increase of the blood's oxygen-carrying capacity, the possible extension of fatigue limits by reducing the levels of lactic acid to enhance athletic performance.

Methodology: Survey of the nutritional habits of the study subjects by means of questionnaires. Analysis of sport performance by static and dynamic measurement of muscle strength and by ergometer. Body composition analysis of the body fat percentage and muscle content determination.

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## SUPPORT OF THE DIETOTHERAPY OF DIABETES PATIENTS BY USING A MOBILE APPLICATION PROGRAM

According to the data of the International Diabetes Federation, there are 387 million people living with diabetes, the prevalence of diabetes is 8.3%. The diabetes prevalence is 7.5% among the domestic population. The object and purpose of the research is to support the development of a mobile application system from the point of view of dietetics. This application would hinder the progression of diabetes and thus decrease complications. Our hypothesis is that the mobile application systems and motivational trainings providing individualized patient motivation assessment systems as well as blood sugar level prognosis possibilities would support the development of better life-style habits.

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## INVESTIGATION OF BIOLOGICALLY ACTIVE COMPONENTS IN FOOD

One of the focus points of the research is the determination of the antioxidant properties of domestic foodstuffs (e.g. honey, small-series vinegars, fruits and vegetables as well as their preparations, fermented alcoholic beverages). We also investigate the impact of certain food processing technologies (e.g. thermal treatment) on changes in antioxidant capacity. These results are completed by targeted, product-specific physico-chemical measurements and (classical and instrumental) sensory analyses. The relationships existing between the different properties can be determined by statistical methods, highlighting new interdependences between these, enabling estimation of botanical/geographical origin. The other main direction of our research is the determination of allergen contaminants and mycotoxins in selected foodstuffs and devices used during food processing.

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## MONITORING NUTRITION STATUS AND NUTRIENT VALUE AT ALL AGES TO IDENTIFY FACTORS OF DIET-RELATED DISEASES AND HEALTH PRESERVATION

There is a worldwide growing interest in the investigation of the nutritional status and erroneous eating habits. These interrelated factors heavily affect the development and quality of life of the human organism from conception to ripe old age.

Nutrition related problems also occur in the developed countries apart from the developing countries.

Therefore, the study and assessment of the nutritional habits and of the closely related nutritional status are important focus areas of reseraches in the developed countries.

The study of the young adult age group plays a particularly important part in this field, because during these formative years young adults are consolidating their health-influencing life habits.

The investigations will be planned to be conducted among young adults.

The research participants are the students of the Semmelweis University Faculty of Health Sciences.

The nutritional status analysis will be carried out on InBody 770 bioimpedance analyser device. The procedure incorporates Body Mass Index calculation. The nutritional intake of the subjects will be recorded with the help of a 3-day dietary record.

The recorded data will be analysed with the help of the NutriComp nutrition analysis software. The statistical evaluation will be carried out with the help of SPSS and Microsoft Excel softwares.

There have been mainly cross-sectional studies conducted in our country to this day. The novelty content of this study is that it is a groundbreaking longitudinal study.

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## DEVELOPMENT OF FUNCTIONAL FOOD PRODUCTS

Objective of the research is to develop food products in several food groups (such as bakery products, dried pasta, milk substitute drinks etc.) that are suit to certain diets and have additional nutritional value. Gluten and milk free food products are intended to produce with high protein, dietary fiber, vitamin and antioxidant content and with low sugar and carbohydrate content in order to meet the requirements of both the food industry and the consumers.

Product composition and technological properties are analysed using classic and instrumental analytical methods such as titration, spectrophotometry, liquid chromatography. Physical properties are also tested with special focus on rheological characteristics using rotational viscometry and texture profile analysis methods. Sensory properties of product are evaluated using well documented methods including statistical analysis.

Wide range of measurement results allows us to investigate the interactions between certain food ingredients and to evaluate nutritional value of the developed food products. Nutritional and technological aspects of food development are combined resulting healthy and attractive products.

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## INVESTIGATION OF THE EFFECTS OF DIET WHEAT AND LOW FODMAP DIET IN INFLAMMATORY INTESTINAL PATIENTS WITH IRRITABLE INTESTINAL SYNDROME AND IN REMISSION

Irritable Bowel Syndrome (IBS) is a functional disease of the gastrointestinal tract. It affects 10-15% of the population worldwide and accounts for about 25% of all outpatients in gastroenterology outpatient clinics. The low-FODMAP (low-fermentable oligosaccharide, disaccharide, monosaccharide, and polyol) diets have been shown to alleviate complaints in patients with IBS, and there has been an improvement in IBD-specific scoring. The aim of the research is to investigate the effects of fermentation spelled wheat and traditional gluten-free breads on the quality of life, with particular reference to abdominal discomfort and bloating complaints, supported by clinical data.

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## SWIMMER'S SHOULDER PREVENTION IN CHILDHOOD

The most common musculoskeletal disorder among swimmers is chronic pain in the front part of the shoulders. This condition is also known as swimmer's shoulder and its lead symptom is the pain felt during or after activity, which may be followed by the pinch of movements in the shoulder joint, and malfunction. The incidence of swimmer's shoulder is considerably high among competitive swimmers; published data show that 40-91% of them are affected (depending on age, gender and training intensity).

The aim of recent research is to examine swimmers (aged 11-13 years) of the „Jövő Bajnokaí” program of the Hungarian Swimming Association in order to identify risk factors, plan a prevention program, practice it with children, and educate trainers.

Long-term aims are to identify and prevent other musculoskeletal problems in connection with swimming, and to educate physiotherapists who will work in swimming pools.

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## THE ROLE OF EFFECTIVE HEALTHCARE COMMUNICATION IN IMPROVING ADHERENCE

**Objectives.** The goal of my research is to examine the relationship between the communication strategies used by physiotherapists (therapists) during first visits and patients' subsequent level of satisfaction, motivation, and commitment to treatment. The analysis of these interactions will mainly concentrate on the use of open-ended questions and reflective listening techniques, and the amount and detail of the information the patient receives.

**Data, Methods.** We will conduct an observational, cross-sectional survey study, which will explore possible correlations between therapists' communication strategies and patients' attitude.

The collection of data will be completed in two stages. The first step will be to make an audio recording of the verbal interaction between a physiotherapist and his or her patient during the patient's first visit. For the next step, the patient will fill out a questionnaire immediately after the visit.

**The analysis of the data.** The audio recordings will be analysed with qualitative methods. Additionally, the data gained from the audiotapes and questionnaires will be examined by quantitative statistical methods, i.e. correlation analysis.

**Relevance of the research.** Research on doctor-patient communication has demonstrated that there is a relationship between the way/quality of communication and patients' satisfaction, adherence, and health outcomes, e.g. pain. In the long run, medical doctors, physiotherapists, and other healthcare providers would all benefit from a communicational model, which helps to gain patient's trust and improve patients' motivation and adherence to therapy. The results of the research could be utilised in education. The long-term goal is that based on the results of the research an evidence-based communication model is developed, which could be later integrated into the education of physiotherapists.

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## NEW WAYS OF IMPROVING THE FITNESS ABILITIES OF THE INTERVENING STAFF, MANAGING THE EXTREME EFFECTS OCCURING DURING DISASTER ERADICATION

Based on the HAC's science-taxonomic classification and its 2012/7/III/9. and 2014/7/VI/1. resolutions, military science resides within the disciplines of the field of social sciences. Definition: knowledge system summarizing hypothetical theses and experiences defining the success of the military forces and tools applied against the challenges and dangers threatening national and international security.

Modern military science makes recommendations, besides military strategy, military doctrines, military operations, military tactics, on the most expedient organization and execution of the construction of the armed forces, specific shaping of their organizations, their preparations, their material, technical and military healthcare supply and logistics.

Defense science includes the military theory and practice related to warfare, armed combats, defense economics, military technology, policing and law enforcement. In the more and more complex and broad understanding of the defense of the country, the role of the law enforcement is interpretable beside the „classic” military science or within military science (Police; Disaster Management, including the roles of civil defense and firefighting; the NTCA).

The biggest asset of the armed and law enforcement organizations is their staff. The aptitude of personnel should be examined during selection and preparation. The objective of field retention (while upholding deployability, combat capability) is the continuous training, the development of conditional abilities and rehabilitation when necessary. The development of conditional abilities deserves distinct attention in all branches of national defense and law enforcement. During the everyday work of the intervening personnel, they are subjected to enormous burdens. Central nervous systemic, regulatory and muscular (local) factors play a crucial role in the reduction of performance, exhaustion. The hardened can utilize their reserves better; therefore such development of the nervous system needs to play a role in order to keep up the performance of the personnel in the long run. I have given the neurological approach a prominent role in my research, like the examination of coordination and balancing ability. I examine all possible opportunity, which could reduce the damage to health, but at the same time could maximize the years in service and professional fulfillment and the expected quality of life.

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## MEASUREMENT OF PHYSICAL ACTIVITY USING ACTIVITY TRACKER DURING CHEMOTHERAPY IN CRC PATIENTS

It is well-known that movement has a significant role in both primary and secondary CRC prevention. Metastatic CRC patients receive continuous infusion for 48 hours. Patients receiving adjuvant and first-line therapy were enrolled in the study. During treatment, the patients' physical activity is very different; however this information has not been available so far. The general physical activity of the patients varies greatly; therefore, an overall health check is performed before the test. While GLTEQ measures ordinary physical activity habits, the BBS and Tinetti's tests give an objective picture of static and dynamic balance and walking. The SF-MFSI test provided information on physical and psychological activity. Questionnaires QLQ-c30as are taken on the weeks before and after the chemotherapy treatments. AT watches are placed on the patients in the beginning of the therapy, which are removed and evaluated when the treatment is over. The watch measures the number of steps, the distance covered, the strength of movements, and the sleep time. The patient group is homogeneous. By this pilot study we look for answers to the following questions: Can we prove the beneficial effect of physical activity during chemotherapy? What measurable changes may physiotherapy produce in OS, time to progression (PFD), and quality of life? The pilot study is planned for 3 months of training and 5 years of follow-up. TUKEB No. 2016/12

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## COMPLEX PHYSIOTHERAPY IN CYSTIC FIBROSIS

The everyday home treatment of cystic fibrosis is a gruelling burden for the patients. Therefore, some elements of therapy, which are not only important in themselves but also have beneficial effects on each other, are often ignored. The aim of this study, which involved two patients and lasted for four months, was to create a complex home physiotherapy, which helps patients practice all of its elements (inhalation, expectoration, physical activity) in appropriate proportions. This complex physiotherapy guaranteed the presence of all elements, and did not burden the patients above a medium level according to the questionnaire filled out at the end of the study. Even though they could complete less therapy than originally planned, their everyday exercise capacity improved. The main reasons for skipping included illness and lack of time due to work or school.

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**ETIOLOGY AND CLINICAL ASPECTS OF HYPERTENSIVE DYSORDERS IN PREGNANCY AND THE IMPORTANCE OF PRENATAL CARE IN RECOGNITION OF THE DISEASE**

Preeclampsia (PE) is the major cause of maternal and fetal morbidity and mortality, affecting 3-8% of all pregnancies worldwide. miRNAs are short, non-coding RNA molecules which have emerged as key post-transcriptional regulators of gene expression. The function of miRNAs in the placenta is poorly understood, but it is clear that they take part in the regulation of placental development and are essential for normal physiology. Abnormally expressed miRNAs may contribute to complications of pregnancy by causing placental insufficiency.

miRNAs are released from trophoblast cells to the maternal circulation via exosomes predominantly. In PE, impaired placental function with enhanced apoptosis and necrosis causes increased release of exosomes. The expression analysis of circulating exosomal miRNAs may facilitate the development of new biomarkers for hypertensive disorders of pregnancy.

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## DIAGNOSIS AND THERAPY OF CORNEAL DYSTROPHIES

The aim of this study is to evaluate the accuracy of new imaging methods in the diagnosis of vision-threatening corneal dystrophies as well as to measure the improvement in visual acuity after therapy. As a result of this study we can acquire knowledge concerning corneal dystrophies causing poor vision and through the management of the disease we can assure a better quality of life for patients.

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## THE ROLE OF ORTHOKERATOLOGY IN MYOPIA CONTROL

The aim of this study is to analyze the outcomes in more than 150 patients who have undergone orthokeratology at the Department of Ophthalmology, Semmelweis University. This study focuses on objective tests (such as measuring refraction, axial length, corneal thickness) during the follow-up period. The variation of axial length in children subjected to orthokeratology treatment is slight. The control group exhibits more change in axial length than the orthokeratology group. As a result of this study we acquire knowledge about the pathomechanism of myopia progression and the possibilities of influencing it in order to improve the quality of life of patients.

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## NEW POSSIBILITIES IN THE THERAPY OF KERATOCONUS

Keratoconus is a progressive, bilateral corneal ectatic disease that, if not diagnosed preoperatively, can lead to corneal ectasia following refractive surgery. The aim of this prospective clinical study is to evaluate the effectivity of corneal crosslinking treatment in keratoconus at different stages of the disease. We use Scheimpflug imaging, aberrometry and corneal sensitivity measurements to detect subtle changes in corneal topographic, tomographic, optical and sensory parameters after treatment. The results of this study might help to initiate therapy in a timely manner to prevent disease progression and might be used in planning an individualized treatment to effectively prevent further postoperative corneal ectasia in patients with keratoconus.

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## NEW POSSIBILITIES IN THE DIAGNOSIS OF EARLY KERATOCONUS

Keratoconus is a progressive, bilateral corneal ectatic disease that, if not diagnosed preoperatively, can lead to corneal ectasia following refractive surgery. The aim of this prospective clinical study is to evaluate the accuracy of new imaging methods in the diagnosis of early keratoconus with no associated clinical signs. We use Scheimpflug imaging and aberrometry to detect subtle changes in corneal topographic, tomographic and optical parameters. The results of this study might help to initiate therapy in a timely manner to prevent disease progression and might be used in keratoconus screening to prevent postoperative corneal ectasia in patients scheduled for corneal refractive surgery.

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## SURVEY ON THE GASTROINTESTINAL SIDE EFFECTS OF ANTIBIOTICS IN CHILDREN & RECENT PREVENTIVE MEASURES

In the lack of representative and comparable data on the side effects and efficacy of probiotic support during antibiotic (AB) therapy among children, the main goals of present study are:

- a. to evaluate the data of a representative, large scale survey targeting the current prevalence of AB-associated gastrointestinal (aaGI) side effects in children.
- b. To evaluate current preventive therapies and their effects among children receiving AB treatment.

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## ROLE OF INDOOR ALLERGENS IN THE DEVELOPMENT OF ALLERGIES FROM CHILDHOOD

Airway symptoms provoked by indoor allergens (house dust mites, fungal allergens, animal dander etc) many times may mimic regular symptoms of common cold. Delay in the diagnosis may result in the development of concomitant further allergies (allergic march).

The main goal of the study is the elaboration of better preventive measures by understanding the role of indoor allergens in this process.

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## PREVENTIVE NURSE CARE IN EUROPE

In Hungary preventive nurses deal with families in mostly two developmental periods: during the pregnancy and when the child is between 0-7 years old. The preventive nurse system was established in 1915 in Hungary. Their training consists of an 8-semester education at university today. We would like to examine what kinds of experts provide the same assistance for the families in different European countries. Our survey concerns paramedical experts who care for the families and supplement doctors' work. The following questions are important: What is the qualification of the person who cares about the pregnant woman, but who is not a medical doctor? How long is her training? What kind of examinations may the paramedical perform independently? Who performs the first home visit of the newborn after delivery? What is the qualification of the person who cares for the newborn, but who is not pediatrician? Who controls the vaccination of children? Does the paramedical have any tertiary education? If so, how long was it?

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## EXAMINATIONS OF URINE HOLDING AND EVACUATION PROBLEMS

Urodynamics is the study of function of the lower urinary tract. There is a significant application of this technology in a number of diverse clinical pediatric problems, and it can be used in patients of both sexes from infancy to adulthood. The aim of the study is to investigate micturition in children with Type 1 (insulin-dependent) diabetes and to look for early signs of diabetic autonomic neuropathy, and to assess the relationship between urinary bladder dysfunction and subclinical cardiovascular autonomic neuropathy in diabetic children and adolescents. To investigate neurotoxicity of different drugs for bladder function.

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## A PROSPECTIVE ANALYSIS OF POSTPARTUM FEMALE SEXUAL FUNCTIONS

Childbirth bring many changes into a couple's life including sexuality. Postpartum female sexual problems are common after birth. Our research sought to investigate how the mode of delivery, newborn feeding methods, incontinence, and quality of relationship, depression and body image as well as sociodemographic functions influence postpartum female sexual functions. We planned a prospective analysis using validated and self-made questionnaires. The results can help to understand the connection between these factors, which can be the base of further professional protocols.

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## SURVEY ON THE CAUSES OF THE EMERGENCE OF PREMATURE BIRTH/LOW BIRTH WEIGHT/DEVELOPMENTAL DISORDER

In Hungary, the proportion of premature births is 8.7%. This is higher than the European average (2016), which has not changed significantly over the past two decades. Comparing to European countries, we find the highest proportion of "immature premature babies" (<34 weeks) (15%), which means nearly 1,400 babies per year. In addition to premature births, there is a significant incidence of mild (39.9 / 1000) and severe (13.9 / 1000) developmental disorders. These conditions significantly affect short-term survival chances after birth, and long-term health-related years, causing chronic illnesses and often permanent damage. These facts affect the development of a person and also have a significant effect on the family's functioning, its possible weakening and numerous social processes. The emergence of these two crises has significant implications for pregnancy-related and non-maternal illnesses, demographic, social, economic and psychological impacts on maternal health behaviors, addictive behaviors. The detailed mapping and correlation analysis of these facts help to design interventions based on representative research results in Hungary.

TUKEB number: 5297-2/2018/EKU

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## THERAPEUTIC ADHERENCE OF ORAL ANTICOAGULANTS

Therapeutical adherence of patients is necessary for the effective medical treatment. As venous thromboembolic diseases have a high morbidity and mortality rate, and these patients experience significant decrease in the quality of life, prevention and effective treatment have a great importance. It is well known that only 40% of patients with venous thromboembolic diseases are treated effectively. We have to recognize the factors of non-adherence to improve the efficacy of the treatment. The aim of the research is to identify the factors of non-adherence, to map the patient's knowledge about their illnesses, to improve patient education. Comparing the therapeutical adherence to vitamin K antagonists and new oral anticoagulants are also part of the study. The main goal is the improvement of the efficacy of anticoagulant therapy.

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PARTNER INSTITUTION: Semmelweis Egyetem Szent Rókus University Hospital and its Institutions

## ECONOMIC AND PATIENT SAFETY ISSUES RELATED TO ONE-DAY SURGERY

We would like to make a review about the rules, specialities and problems concerning One-Day Surgery in Hungary compared to other countries. Subsequently we project a representative assessment questionnaire about One Day Surgery in Hungary. The topic of this study is the economical organisation and patient safety at One-Day Surgery, especially infection control.

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## PREPARATION AND EXAMINATION OF TPN SYSTEMS FOR INDIVIDUAL CLINICAL THERAPY. PRACTICE OF CLINICAL NUTRITION. ANALYSIS OF TEAM WORK PRACTICE IN CLINICAL NUTRITION

Follow-up of the stability of all-in-one TPN mixtures with the use of non-invasive spectrophotometry.  
Analysis of the use and effects of enteral nutrition in elderly care in Budapest/countryside and in rehabilitation centres.

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## EXAMINATION OF PLATELET RETRACTION IN PATIENTS WITH ANTIPHOSPHOLIPID SYNDROME

Decreased platelet retraction augments the possibility of thrombosis generation. Antiphospholipid syndrome is characterized by arterial and venous blood clot generation and also the abnormality of platelet function. Examination of platelet retraction is carried out with the help of a retractometer created in the Department of Biophysics and Radiation Biology. It allows for a new, quick and more informative diagnostic examination.

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### INVESTIGATION OF ON-DUTY PARAMEDICS' ATTITUDES TOWARDS DEATH, AS WELL AS OF FACTORS THAT INFLUENCE IT

The meaning of death differs fundamentally from one culture to another, and attitudes to death are constantly changing in function of the given cultural and social system. Man, although afraid of death, is curious. Fear of our own death is a negative emotional reaction that is provoked by recalling a state when we personally encounter the end of a life during work. Examining the issue of death is also justified by the demographic and economic changes in welfare societies. The sustained rise in average age and the decline in the birth rate have led to a decline in the population of welfare societies, which entails a number of health, pension insurance and social problems. The rapid increase in the number of the elderly places a not insignificant burden on the health care system, a special branch of which is emergency care. Relatives of these patients often seek the assistance of the national ambulance service, therefore it is often the paramedics who are the first to encounter dying or deceased people. Employees must prepare for this – sometimes even - everyday experience, and thus they have to master various coping strategies to work smoothly. The often negative coping strategy created by stress has a significant long-term adverse effect on health. Over time, this leads to poor quality years of life and premature death. Exposure to enhanced stress and its consequences has long been known to ambulance workers. As mentioned above, encountering death is an inherent and, as such, stressful factor of prehospital care. In the current research, we seek to determine how paramedics' attitudes toward death influence conflict resolution responses and whether upbringing plays a role in developing these responses.

Aim of the study: To look at correlations and influencing factors between the attitudes towards death as a stressor factor, conflict management responses, and upbringing. Knowing all these interrelationships it is possible to create more effective conflict resolution responses, thus coping with death-related stress among on-duty paramedics.

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**FAST MICROBIOLOGICAL METHODS BASED ON THE PRESENCE OF ATP TO PREVENT INFECTION**

In order to improve patient safety, more effective controls are needed in the cleaning and disinfection protocol of health care institutions and in the hygiene practices of health care personnel. The cleanliness of the health environment can be checked by disinfection methods. In Hungary, the detection of fluorescent gels by UV light has become a very popular and useful tool for checking the purity and disinfection of patient care. However, despite its many advantages, it does not have the ability to quantify the extent of contamination on surfaces. Our ATP presence meter, however, can meet this expectation, so it can be used to easily evaluate the purity of the surface and the liquid. Classical microbiological tests give specific results on bacteria and pathogens on the surface, which takes longer. Especially with regard to environmental hygiene controls, by the time the result arrives, we can no longer take remedial action to eliminate the problem, so time is of the utmost importance.

In our research, we are looking for possibilities for new applications of ATP-based measurement techniques, especially in the field of disinfectant efficacy.

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## STUDY OF ANTIMICROBIAL EFFICACY OF LAVENDER

### *Introduction*

In 2018, the Hungarian Pharmaceutical Society chose lavender as the Herb of the Year. Based on our previous research, lavender decoction not only has a very high antioxidant capacity and a high content of polyphenol and flavonoid, but it also effectively inhibits the growth of oral pathogens such as *Escherichia coli*, *Staphylococcus aureus*, *Streptococcus aureus*, or *Candida albicans*.

### *Objective*

Investigation of the antimicrobial activity of various lavender aqueous extracts against food spoilage pathogens and detection of its chemical residues.

### *Material and Method*

Testing 5 -10 commercially available product containing lavender flowers for human consumption from different manufacturers and countries. Extraction methods:

- soaking in cold water for 24 hours
- decoction (boiling for 15 minutes)
- infusion (with a duration of 15 minutes)
- combined process (24h soaking, 15min boiling)

After the extracts were cooled down, filtered and centrifugated, the solvent will be removed with a vacuum evaporator. The resulting lavender extracts in powder form are going to be dissolved in acidic, alcoholic and aqueous media, then tested for antimicrobial activity by disk diffusion method and with biochip technology for the presence of detectable residues. For microbiological testing, we are going to use foodborne pathogens according to our plans as *Salmonella*, *Listeria*, *E.coli* and numerous strains of yeast, mold and fungi that cause food spoilage. These are being selected and refined.

### *Utilization of results*

In case of favorable results, the powdered form can be easily marketed and used as a natural preservative in food production, increasing the shelf life of the products by inhibiting the growth of decaying microbes. Further research, product development tests, organoleptic tests are warranted, during which the use of lavender extraction as a natural preservative can be exploited.

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## HEALTH RISK ASSESSMENT OF ENVIRONMENTAL DISEASES

Natural and built environment both have significant impact on human health. The environmental burden of disease in Hungary is 16 % according to the estimate of the World Health Organization (WHO), which is a heavy toll on both the healthcare system and the society. Efficient reduction of the environmental burden of disease requires mapping the most significant and prevalent risks. Environmental health risk assessment is the most objective tool for the identification of the adverse health effects from the exposure to different environmental pollutants.

The health impact of the indoor environment is exceptionally important, since we spend almost 90 % of the day indoors. The chemical and biological air quality, the quality of construction materials and the condition of the plumbing system are all relevant to our health.

The analysis of these factors through risk assessment and the development of risk management interventions will contribute to the improvement of human health.

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## ASSESSMENT OF ENVIRONMENTAL HEALTH RISK AWARENESS

The significant health impact of environmental pollution implies that not only the risk assessment of the professionals but the risk awareness of the public should also receive attention. Risk awareness is primarily a subjective assessment process. Rational risk awareness has high impact on the risk itself and the means of risk management, thus influencing the probability and extent of adverse health effect.

The assessment of the risk awareness of the public requires the analysis of the relationship of the environment and health, the prevalence of potentially environment-related diseases, and the public knowledge of environmental questions. The results of the analysis indicate the applicability and the potential limitations of the psychometric paradigm developed for risk awareness and the cultural theory in the Hungarian context. The outcomes facilitate the more efficient risk communication through rational risk awareness, the prevention and recognition of environmental diseases and subsequently improve the efficiency of health protection.

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The use of materials produced by nanotechnology is expanding, due to their advantageous technological features. However, beside the numerous positive characteristics of nanomaterials, their negative impact on the environment and human health was also confirmed in a number of cases. The lack of data is the major limitation for the systematic assessment of the potential adverse effects of nanomaterials. Therefore the systematic review and analysis of the available data on environmental and health impact is crucial, as well as their complementation by measurements or modeling. For nanomaterials which are currently in common use from pharmacy to food production it is also indispensable to carry out in vitro testing in biological-toxicological test systems, assess their fate in the environment, and human exposure. Quantitative risk assessment of nanomaterials is often hindered by the lack of data. Semi-quantitative modeling is a potential tool to overcome these difficulties, but its applicability needs further assessment. Since the physico-chemical characteristics of nanomaterials often vary even within a size range, assessments should be carried out in the size-dose-effect matrix. The developed models will also assist the identification of specific data need for regulation and risk assessment, and the adaptation of the corresponding test guidelines, but preliminary data on the expected risk should precede the regulatory update. The final aim is the full-scale quantitative risk assessment of nanomaterials based on test result. This is indispensable for the responsible use of nanomaterials.

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