

# Man in Health and Disease. Prevention and Management of Civilizational Diseases

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Arthur Schopenhauer's philosophical statement 'while health is certainly not everything, without health everything is nothing' prompts us to think deeply about its value. Probably we would all agree with Thomas Fuller that 'illness is always an unexpected guest.' That's why it's worth taking to heart the words of Pliny the Elder 'take care of your health today, so that you don't have to dream about it when you are in impotence.'

We give you another, the seventh study devoted to the dissemination of knowledge in the field of prevention of diseases of civilization, leveling their effects within a comprehensive management program.

This time a significant place among the included studies is occupied by: the preventive aspect of pro-health education in civilization diseases, physical activity as an essential element of normal development and health, the risks and benefits to health arising from sports and recreation, a holistic approach in therapy and patient care, or the health of society in the face of threats of the 21st century.

As a natural corollary to the experiences of past years, there were also emphases on assessing the impact of pandemics on the physical and mental health of individuals and entire communities, as well as reports on the use of AI in therapy.

## Post-conference report

### Keywords

- civilizational diseases
- human health
- conference abstracts

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We hope that, like the previous conference papers, the present one will also provide an opportunity to learn about current scientific developments in the broad area of knowledge of the Health Sciences discipline and become a platform for the exchange of experiences at a high level of scientific discourse. We trust that the experience of previous years will be of great interest to health professionals, patients and the community.

The knowledge and experience you will gain from reading the conference book of abstracts: *Man in Health and Disease. Prevention and Management of Civilization Diseases*, may it be a confirmation of the words of American writer Franklin Adams that 'health is the factor that makes us feel that we are just at the best time of our lives.' Let us appreciate its value and let this awareness be a strong motivation to strive for our own health, as much in this regard depends on ourselves.

*Head of Scientific Committee*

*Wiesław Chwała*

## Protecting populations health by protecting professionals' health

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At the forefront of the battle against the unexpected COVID-19 pandemic, health professionals worldwide have assumed a controversial role by caring not only of the population affected by the SARS-Cov-2 but also playing an important part in the infection prevention, assuming more responsibilities, new techniques and competences related with the new situation, facing the populations' health challenges that the pandemic situation has come with, especially in relation with mental health, isolation, family issues and other physical sequelae, all even with negative effects for themselves in terms of health, well-being and professional motivation. Research has stressed that these professionals were exposed to high levels of stress, anxiety, and physical and emotional exhaustion due to the unknown situation they were facing, though it was not something new for these professionals, like nurses and physicians, belonging to some of the most stressful professions over the years and around the world. Work overload, inadequate resources, personal infection fears, and constant pressure represent a few of the experiences faced by these professionals during the pandemic and before the pandemic arrival. These could be some of the reasons for the continuing increase of nursing intention to leave the profession nowadays and subsequently contributing more to nursing shortage worldwide and health organizations' difficulties to provide

professional quality and safe care. My lecture will explore whether nurses and other health professionals are provided with coping strategies and educational resources to maintain their well-being during their training at higher education institutions and in continuing professional development to overcome the emotional and psychological burden and fatigue impacting on their own well-being. The outcomes of a descriptive qualitative method applied in Spain and other Latin American countries towards exploring these professionals' voices will be shared with the audience. The results revealed that health professionals' well-being necessitates an investment in strategies and skills during their training to overcome these situations and those potentially about to come. The scarce number of initiatives, projects and strategies implemented worldwide will be exposed too.

## Effect of cardiorespiratory fitness on glycaemic control and quality of life in children with type 1 diabetes

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**Introduction:** The primary goal of managing Type 1 Diabetes Mellitus (T1DM) in children is to optimize metabolic control and enhance long-term quality of life. Despite this, there is limited data regarding their physical activity levels, motor skills, and their quality of life relative to their healthy peers.

**Objective:** This study aims to evaluate the physical activity levels and cardiorespiratory fitness of children aged

8 to 18 with T1DM, assess their health-related quality of life, and compare these aspects with those of their healthy counterparts. Additionally, the study aims to identify factors that may explain glycemic control.

**Material and methods:** Cardiorespiratory fitness, anthropometric characteristics, and quality of life were assessed in 236 children aged 8–18, including 106 with T1DM (50% male). The Pediatric Quality of Life Inventory Generic Module (Varni et al., 2003) was used to measure quality of life, while cardiorespiratory fitness was estimated using the equation proposed by Léger et al. (1988) based on the 20-meter shuttle run test. Physical activity levels were evaluated using the Physical Activity Questionnaire for Older Children (PAQ-C) and the Physical Activity Questionnaire for Adolescents (PAQ-A) (Kowalski et al., 1997).

**Results:** There were no significant differences in body composition, as indicated by skinfold thickness and BMI z-score, between children with diabetes and age-matched controls. Physical activity levels were similar between the two groups. Although perceived quality of life did not differ between the groups based on the PedsQL general module, children with diabetes exhibited lower cardiorespiratory fitness, as expressed by  $\dot{V}O_{2max}$ , compared to controls. Regarding factors influencing glycemic control, only maximal oxygen consumption was found to be significant.

**Conclusions:** Children with diabetes demonstrated a health-related quality of life comparable to that of their peers, both in physical and psychosocial aspects, suggesting a similar overall quality of life experience. Despite similar physical activity levels, a disparity in  $\dot{V}O_{2max}$  was observed, indicating lower cardiorespiratory fitness in children with diabetes. Thus, interventions promoting aerobic exercise may potentially enhance the clinical condition of these patients.

**Keywords:** focus group, movement analysis, students, satisfaction, training evaluation

## Health behaviors of women between 50. and 74 years of age, suffering from osteoporosis and healthy

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**Introduction:** The aim of the study was to characterize women's health behaviors with osteoporosis and healthy between 50. and 74. years old.

**Material and methods:** The study was conducted on a group of 400 women who already had menopause. These women benefited from comprehensive diagnostic care at the Malopolska Medical Center in Krakow at the turn of 2016 and 2017. The subjects were divided into two groups: group I – women with osteoporosis (KO) and group II – control group (KZ), healthy women. The research used the diagnostic survey method to assess the health behaviors of the examined women. The research tool was a questionnaire divided into four parts. The first part contained questions about factors predisposing to the occurrence of osteoporosis independent of the examined, resulting from family diseases. In the second part there were questions about osteoporosis risk factors, with which the subject is born. The next part of the survey contained questions about lifestyle risk factors. The last part includes the record. All patients underwent densitometry with the DEXA method. **Results:** Current exercise KO – 36.5%, KZ – 2.5%; frequency of physical exercises (daily) KO – 34.5%, KZ – 0%; short walk every day KO – 77%, KZ – 80%. Current consumption of calcium-containing products (daily): milk KO – 26.5%, KZ – 0%; yellow cheese KO – 30.5%, KZ – 0%; KO – 42% yogurt, KZ – 12%; lean cottage cheese KO – 36%, KZ – 0%. Coffee consumption (several times a day) KO – 51%, KZ – 15%; smoking KO – 37.5%, KZ – 3.5%. All women with osteoporosis regularly used vitamin D3 supplementation and calcium.

**Conclusions:** In the prevention of osteoporosis, broadly understood education including risk factors for this disease should be taken into account, with a particular focus on a balanced diet and regular physical activity, and the avoidance of psychoactive substances.

**Keywords:** osteoporosis, health behaviors, risk factors

## Analysis of trends in Internet users' interest in terms related to breast cancer prevention in October in Poland in 2013-2023

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**Introduction:** October has been recognized around the world as breast cancer awareness month for many years. The originator of the “Pink October” campaign is Evelyn Lauder, who introduced the pink ribbon in 1992 as a symbol of the fight against breast cancer and encouraged people to wear it as an expression of support for the sick. According to the international ranking from November 2023, the most popular search engine in the world is Google (71.61%). An interesting Google service is the Google Trends (GT) tool – a website that provides daily insight into what the world is searching for on Google, showing the relative amount of search traffic for any query in any language depending on the time and region of queries directed to the Google search engine.

**Objective:** The aim of the study is to analyze trends in Internet users' interest in terms related to breast cancer prevention in October in Poland in 2013–2023.

**Material and methods:** In this retrospective study, 14 selected entries in Polish were analyzed on the Internet regarding topics related to breast cancer and prevention. The period from October 1, 2013 to October 31, 2023 was analyzed. The tool was the Google Trends service, with which we obtained data on the number, origin, time dependence and main regions of queries directed to the Google search engine. The ranking of the obtained entries was sorted by language (all entries were entered in Polish), the entries were also sorted by country (the territorial scope was selected – Poland). Entries whose search volume did not reach the minimum value threshold during the analyzed period were excluded. The survey was conducted on November 1–2, 2023. According to the Google Trends algorithm, search interest was quantified on a standardized scale of 0–100 GT. The linear trend for each entry was calculated using the square of the correlation coefficient.

**Results:** The research showed a clear upward trend in the years 2013–2023 in the interest of Internet users in the months – October in the following terms:

“mammography”, “breast ultrasound”, “breast examination”, “breast self-examination”, “breast magnetic resonance imaging” and “mastectomy”. The square of the correlation coefficient for these entries was: “mammography” –  $R^2 = 0.8645$ ; “Breast ultrasound” –  $R^2 = 0.8631$ ; “breast examination” –  $R^2 = 0.5493$ ; “breast self-examination” –  $R^2 = 0.5083$ ; “magnetic resonance” –  $R^2 = 0.5683$ ; “mastectomy” –  $R^2 = 0.4166$ . In the case of the remaining entries, there was no upward trend, in the case of the entry “breast cancer”  $R^2 = 0.041$ . Among the analyzed terms, Internet users were most interested in: “mammography” and “breast ultrasound”. Interestingly, in the case of these entries, there was a similarity in the time trend in 2013–2023. In the case of both terms, the greatest decline in interest was recorded in April 2020 – at the beginning of the COVID-19 epidemic. Analyzing the data, a certain seasonality can be observed in the interest in the terms: “mammography”, “breast ultrasound” – in the case of these terms, the annual peak of interest was in the years 2013–2023 almost always fell in the month of October. Internet users' interest in the phrases: “breast cancer prevention”, “breast cancer symptoms”, “breast cancer in men”, “breast examination”, “breast magnetic resonance imaging” remained low in the years 2023–2023. There was also a similarity in the time trend in the years 2013–2023 in the case of the terms “breast biopsy” and “BRCA 1”.

**Conclusions:** There was an increase in interest in the terms: “mammography”, “breast ultrasound”, “breast examination”, “breast self-examination” and “breast magnetic resonance imaging”, which indicates the growing awareness of women about the importance of breast cancer prevention. Seasonality in interest in “mammography” and “breast ultrasound” tests in October may be related to Breast Cancer Awareness Month. Low interest in symptoms and seeking information about breast cancer in men indicates the need for further educational activities in this area. The impact of the COVID-19 pandemic on the decline in Internet users' interest in words related to breast cancer was particularly visible in April 2020, at the beginning of the pandemic. Analysis of trends in searches for terms related to breast cancer can provide valuable information about the level of public knowledge and interest in this issue, changes in the perception of breast cancer over time, and the effectiveness of educational campaigns.

**Keywords:** breast self-examination, mammography, Google Trends, women's health, breast cancer

## Health-promoting behaviors of women and their opinions on the quality of fitness services, depending on experienced musculoskeletal injuries

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**Introduction:** The increasing awareness of modern societies about the adverse consequences of a sedentary lifestyle has an impact on the growing interest in physical recreation. The study aimed health-promoting behaviors and opinions on the fitness services quality in women, depending on experienced musculoskeletal injuries.

**Material and methods:** Research using the diagnostic survey method included 100 women aged 35–55, clients the EuroGym fitness club in Krosno, Poland. Research tool was a self-made questionnaire, covered three thematic sections. The Mann-Whitney U test and the Pearson Chi-square test were used to analyze the results.

**Results:** There were statistically significant dependences of declarations about medical consultation before deciding to use fitness club offerings with group membership ( $p = 0.044$ ). The majority of women, regardless of group, did not use wellness ( $p = 0.086$ ). Most respondents considered the instructor's competence to be high ( $p = 0.080$ ).

**Conclusions:** It is necessary to point out the necessity of implementing programs to popularize the need to consult the state of one's own health with a doctor before participating in fitness activities. In addition, it is necessary to popularize the importance of wellness for tissue regeneration and leveling the effects of fatigue on the body in women undertaking fitness training.

**Keywords:** health-promoting behaviors, fitness services quality, physical and health condition, musculoskeletal injuries

## Education regarding breast cancer prevention as part of the operation of occupational medicine

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**Introduction:** Tasks related to occupational medicine include performing basic, periodic and also follow-up examinations. Occupational medicine also provides preventive care for working people, counseling employees who suffer from occupational diseases. It also provides diagnostic tests and pathology consultations. The purpose of the study is to show the tasks related to breast cancer prevention in occupational medicine. **Material and methods:** A total of 31,619 women from 2016 to 2021 were included in the project. Data for the study were collected thanks to the database of the Gynecology Outpatient Clinic located within the occupational medicine of the Medyk Medical Center in Rzeszow.

**Results:** The years 2019 and 2020 were marked by the lowest number of women performing breast self-examination. The difference in these years was significant in relation to 2016–2018, in which the results were the highest. In 2021, there was a result that was not statistically significantly different from the results of 2016–2018, but also from 2019–2020. The highest number of women performed breast self-examination in the autumn months. In contrast, the highest number of nodules was found in patients in 2019 (from 15% to 24.2%). There were no differences between the number of women performing breast self-examination in each month ( $p = 0.8451$ ).

**Conclusions:** This study showed the rationale for conducting services aimed at preventive measures in Occupational Medicine, including the need to teach breast self-examination. It calls for the expansion of educational activities aimed at raising awareness and detecting important risk factors in workplaces.

**Keywords:** woman, cancer, breast cancer, breast self-examination, occupational medicine



## The use of dynamic thermography and the assessment of balance and foot positioning to support the diagnosis of diabetic foot – preliminary research

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**Introduction:** Diabetes can lead to nerve damage and a complication called diabetic foot, which often involves the amputation of fingers and even the foot. The use of active thermography in supporting early diagnostics was proposed.

**Material and methods:** The research was conducted on groups of diabetics (with or without other diseases) (32 people) and people without diabetes (6 people). A series of thermographic tests were carried out using a device for controlled cooling of feet of our own design. Groups: 0 – people without diabetes; 1– diabetes and other diseases (not adversely affecting the thermographic image at the time of measurement); 2 – diabetes and neuro-metabolic diseases; 3 – diabetes and painful feet at the time of examination. A foot thermogram was performed so that both feet were visible on the thermogram. A FLIR E70 camera was used. The feet were cooled to a temperature of about 16–19°C for about 8 minutes. Then, temperature changes were observed for several minutes, recording a series of thermograms. The research was supplemented with a questionnaire. Additionally, static balance and symmetry of loading with own body weight were assessed using the Balance4Me platform with MassTrack software, as well as an assessment of foot positioning using the FPI (Foot Posture Index) Questionnaire, which will be the subject of the next study. About 350 thermograms were obtained. On each of them, the temperature of an area with an area of approximately 9 pixels was determined for 10 points of the left foot and 10 points of the right foot. The temperature difference was analyzed for analogous points of the right and left foot. The analyzed temperature distribution on the foot

surface changed after cooling, when the feet returned to the proper body temperature.

**Results:** The results regarding the temperature difference for analogous points of the right and left foot obtained for two groups: diabetics with foot pain and neuro-metabolic diseases are statistically significantly different. The largest temperature differences for the corresponding surfaces of the left and right foot appeared in the areas affected by pain.

**Conclusions:** Active thermography examination can support the diagnosis of diabetic foot in diabetics.

Research was carried out in cooperation with the European Podiatry Institute in Tarnów, Rzeszów and Warsaw.

**Keywords:** diabetes, dynamic thermography, cooling, diabetic foot

## Nurses' subjective assessment of intestinal stoma knowledge versus their actual level of knowledge

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**Introduction:** Nurses at various stages of their careers encounter information on intestinal stoma. This topic is so important that it appears both in the course of studies and in numerous training courses and specializations. Despite the high level of qualification in this area of nursing, it is noticeable that nurses underestimate their professional competence.

**Objective:** The purpose of this study is to compare the nurses' subjective assessment of their knowledge of intestinal stoma to the actual level of knowledge.

**Material and methods:** The study included 66 nurses and nurse practitioners between the ages of 22 and 65 working in Lublin Province. Most of the respondents had a university education. The research tool used was a proprietary survey questionnaire.

**Results:** A higher self-assessment of knowledge than the observed level of this knowledge was characterized by 17 respondents, while as many as 49 respondents rated their knowledge lower than their actual knowledge. The difference was statistically significant and moderate,

$Z = 3.919$ ;  $p < 0.001$ ;  $r = 0.482$ . Respondents rated their knowledge lower ( $M = 69.31$ ;  $SD = 24.86$ ) than the level of knowledge obtained in the author's test ( $M = 82.41$ ;  $SD = 12.84$ ). The analysis showed correlations between the respondents' self-assessment of their stoma knowledge and the ward they worked in. Those working in surgical wards rated their knowledge higher.

Conclusions: Subjective assessment of the level of knowledge about intestinal stoma of the subjects was not adequate to the level of knowledge represented. The subjects had a significantly higher level of knowledge about intestinal stoma than they declared.

Keywords: nurses, stoma, medical knowledge, self assessment

## Patients' knowledge and health behaviors regarding non-pharmacological methods of lowering high blood pressure

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Introduction: High blood pressure can be treated both pharmacologically and lowered through non-pharmacological methods. Patients should follow the prescribed pharmacotherapy and know and use non-pharmacological ways to lower blood pressure.

Objective: The purpose of this study was to assess the knowledge of non-pharmacological management to lower blood pressure in patients with hypertension and the application of these measures in daily life.

Material and methods: The study group consisted of 108 patients with high blood pressure. The study used the diagnostic survey method. The interview technique was used implementing the author's survey questionnaire.

Results: Most of the respondents knew that lowering blood pressure is influenced by proper stress management, normal body weight, salt restriction in the diet,

physical activity, avoidance of alcohol and tobacco and restriction of cholesterol and animal fats in the diet. Less than half of the respondents realized the recommended physical activity. About half of the respondents were familiar with both recommended and not recommended products in high blood pressure. Respondents experienced stressful situations in daily life, nervousness often and sometimes – most often on average were able to cope with stress, significantly worse coping with stress were residents of rural areas than urban areas.

Conclusions: The knowledge of the respondents on non-pharmacological methods of lowering blood pressure was quite high, while health-related behavior concerned about half of the respondents. Emphasis should be placed on motivating patients to behave healthily.

Keywords: arterial blood pressure, knowledge, health behavior

## Sedentary lifestyle as a factor reducing female and male fertility – literature review

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Introduction: A sedentary lifestyle along with reduced sleep time and changes in diet are the main lifestyle changes that have occurred in the last few decades. By 2024, a number of scientific research reports have been published, the results of which indicate a relationship between a sedentary lifestyle or reduced physical activity in general and female and male infertility. In order to organize this information, a literature review was conducted.

Material and methods: Searching by phrase „sedentary lifestyle fertility” was made in PubMed/Medline. The content of 38 articles was analyzed.

Results: The articles show among others that lack of physical activity and excessive amounts of adipose tissue in men and a sedentary lifestyle in women are associated with idiopathic infertility, and that physical activity, by reducing the activity of systemic inflammatory mediators, may contribute to improving women's

fertility. Obesity in women results in difficulty conceiving naturally and an increased risk of miscarriage or premature birth. This is probably due to oxidative stress, inflammation and insulin resistance. There are more studies explaining the pathogenesis of male infertility than those regarding this problem in women. It has been shown that physical exercise deficiency reduces the concentration of FSH, LH and testosterone. Obesity results in increased sperm DNA fragmentation, abnormal morphology and low mitochondrial membrane potential. A sedentary lifestyle increases oxidative stress and causes an increase in testicular temperature (by an average of 0.7°C). On the contrary, physical training is associated with improved sperm DNA integrity, lengthened sperm telomeres, improved semen quality and reduced expression of seminal markers of inflammation and oxidative stress.

Conclusions: Research indicates that the above problems are likely to be related, but larger randomized studies are needed to determine the cause-and-effect relationship between a sedentary lifestyle and infertility more precisely.

Keywords: female infertility, male infertility, lifestyle, civilization diseases

## Overweight and obesity in children and adolescents – prevention, patient education and management

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Introduction: In the context of today's civilization diseases and their occurrence, it is important that people know about these diseases. Awareness of the threat of certain civilization diseases leads to prevention. One of the most common diseases of mankind at that time was obesity.

Objective: The thesis will discuss the civilization disease that is obesity, which is a serious health problem worldwide. In particular, the work speaks about the prevalence of overweight and obesity among children and adolescents. It also takes into account the important role of the knowledge of patients and their parents about obesity. The paper also draws attention to the prevention of this civilization disease.

Results and conclusions: The problem of obesity is already known and loud for a long time in adults. However, in children at the vestibule in recent years, it has become more popular. Overweight and obesity in children and adolescents are now a global health problem. Uncontrolled can lead to serious consequences such as heart disease, type 2 diabetes, respiratory problems, orthopedic and psychological problems such as depression and low self-esteem. Proper prevention and knowledge of the patient about his state of health are therefore important. To prevent obesity, it is important to promote a healthy diet rich in protein and fibre, regular physical activity, nutritional education, reduce screen time and create an environment that supports a healthy lifestyle. However, when we are dealing with obesity, the procedure depends on the individual health situation, the degree of obesity and coexisting health problems, then appropriate treatment is introduced.

Keywords: obesity, children, youth, prevention, civilization disease

## Lung cancer prevention

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Introduction: Lung cancer is one of the most serious health problems in the world, being the leading cause of cancer deaths in both men and women. The increase in the incidence of the disease, especially in developed countries, poses a challenge to the community of effective prevention and treatment.

Objective: The aim of this paper is to draw attention to the problem of lung cancer as one of the great health challenges in the world and to present preventive strategies aimed at reducing the risk of developing this disease. Material and methods: By analysing the main risk factors such as smoking, exposure to carcinogens and air pollution, and presenting methods for early cancer detection, this work aims to highlight the role of prevention in the fight against lung cancer. In addition, by promoting healthy lifestyles, screening for early detection of cancer and measures to improve air quality, this work aims to reduce the incidence of lung cancer and improve overall health by raising public awareness.

Conclusions: The fight against lung cancer requires the collaboration of the community and the medical sector. Prevention, early detection and treatment are key



elements in this fight. Promoting healthy lifestyles and eliminating risk factors are essential to reducing disease. Striving to improve air quality and educating the public on the importance of prevention can help reduce the burden of disease and improve public health.

Keywords: prevention, lung cancer, smoking

## Understanding phenylketonuria (PKU)

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Phenylketonuria (PKU) is an inborn error of phenylalanine (Phe) metabolism that is inherited in a recessive manner. The basic problem in PKU is excessive accumulation of Phe in the patient's body due to insufficient activity or lack of activity of the enzyme phenylalanine hydroxylase (PAH), which converts L-phenylalanine to tyrosine. This defect is caused by mutations in the PAH gene. Toxic by-products of phenylalanine accumulate in the blood and body tissues, which has a devastating effect, especially on the nervous system. Genetic testing plays a key role in identifying carriers and diagnosing the disease in both newborns and adults. Understanding this genetic basis of PKU is fundamental to the effective management and treatment of this rare metabolic disease.

Keywords: phenylketonuria, PKU, phenylalanine, tyrosine, metabolic defect, genetic disease, low-phenylalanine diet

## Health in the face of diseases of civilization – prevention and management

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Introduction: The study focuses on analyzing the role of prevention and management of lifestyle diseases in the context of human health and disease. With the increasing incidence of lifestyle- and environment-related diseases, it is becoming important to understand

effective prevention strategies and appropriate management of these diseases.

Objective: The main purpose of this study is to examine the effectiveness of preventive measures and management of civilization diseases in ensuring human health and well-being.

Material and methods: The study analyzed the impact of diet, physical activity, stress, smoking and alcohol consumption on human health. Moreover, preventive strategies and effective methods of treatment of lifestyle diseases were discussed, with emphasis on the promotion of a healthy lifestyle and public education.

Results: Analysis of the role of prevention and management of diseases of civilization allows a better understanding of the mechanisms of prevention and treatment of these diseases and their impact on human health. This work can provide important guidance for health care systems and medical units in developing effective preventive and therapeutic programs.

Keywords: man, health, civilization diseases, health prevention, lifestyle

## Influence of climbing shoes on the occurrence of ailments and deformities and morphological structure of the foot

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Introduction: Sport climbing is currently a very popular sport. It is distinguished by the need to use a specific type of sports footwear. The purpose of this study was to analyze the effect of wearing climbing shoes on the incidence of deformities and dysfunctions in the foot.

Material and methods: The study included 98 people in the age range of 20–50 years. The study group consisted of 43 people with a mean age of 31.1 years climbing for a minimum of one year with climbing shoes. The control group included 55 people with a mean age of 26.9 years. Using Podoscan 2D FootCAD,  $\alpha$ ,  $\beta$  and  $\gamma$  angles and Clarke's angles were determined, and Wejsflog index was calculated. Information on climbing training, foot pain and injury was also collected using the author's questionnaire. Footwear worn was also

measured. All of the collected information was statistically analyzed using Statistica 13.0 PL.

**Results:** The difference between the length of climbing shoes and athletic shoes worn every day averaged 3.5 cm. For 86% of climbers, the use of climbing shoes is associated with pain. The studied groups of men and women did not differ significantly in the values of  $\alpha$  (men, right foot  $p = 0.94$ , left foot  $p = 0.93$ ; women, right foot  $p = 0.10$ , left foot  $p = 0.35$ ),  $\beta$  (men, right foot  $p = 0.59$ , left foot  $p = 0.77$ ; women, right foot  $p = 0.29$ , left foot  $p = 0.68$ ) and  $\gamma$  angles (men, right foot  $p = 0.86$ , left foot  $p = 0.57$ ; women, right foot  $p = 0.88$ , left foot  $p = 0.68$ ) and Wejsflog index (men, right foot  $p = 0.85$ , left foot  $p = 0.81$ ; women, right foot  $p = 0.36$ , left foot  $p = 0.50$ ). Clarke's angle values for both men and women in both feet were significantly higher in the climbing groups (men, right foot  $p = 0.03$ , left foot  $p = 0.01$ ; women, right foot  $p = 0.02$ , left foot  $p = 0.01$ ).

**Conclusions:** Sport climbers exhibit increased longitudinal arches of the foot compared to the control group. Selecting shoes that are too tight and the associated pain are common among those who train in sport climbing. Education in this regard is necessary.

**Keywords:** sport climbing, footwear, foot, longitudinal arch

## Physical activity during pregnancy – an ally in the fight against gestational diabetes and hypertension

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**Introduction:** Both hypertension and diabetes are lifestyle diseases. Their presence during pregnancy may have long-term effects on the health of a mother and a child, affecting the quality of life and predisposing to the development of other diseases later in life. Therefore, the prevention of these diseases is crucial.

**Objective:** The aim of the study is to draw attention to the problem of gestational diabetes and pregnancy-induced

hypertension as well as to emphasize the importance of physical activity as a factor modifying the risk of these diseases.

**Material and methods:** The work reviews the literature spanning 10 years. The analysis was carried out on March 5–10, 2024, using the following databases: PubMed and Google Scholar. **Keywords:** gestational diabetes, diabetes during pregnancy, pregnancy-induced hypertension, hypertension during pregnancy, physical activity during pregnancy. 22 publications were qualified for the review, the content of which was closely related to the topic of the work.

**Results:** The increasing incidence of gestational diabetes (GDM) and pregnancy-induced hypertension and related complications led to the identification of a potentially modifiable risk factor: physical activity of pregnant women. Both hypertension and diabetes are lifestyle diseases, and when present during pregnancy, they have long-term effects on both the fetus and the mother, affecting the quality of life and subsequent health. The scale of the problem is huge because GDM affects approximately 15%–20% of pregnancies, reaching 30% in some parts of the world, and what is more, women with GDM have a risk of developing type 2 diabetes within 28 years after giving birth may go up to 70%. GDM can increase the risk of macrosomia, hypoglycemia and epigenetic changes in infants, leaving the new generation vulnerable to obesity and type 2 diabetes later in life. Arterial hypertension affects 5%–10% of pregnant women and may pose a threat to the life and health of both the mother and the fetus. Most pregnant women do not follow current recommendations regarding physical activity, and many of them remain inactive during and after pregnancy, which carries a greater risk of morbidity and obesity.

**Conclusions:** Appropriately selected physical activity can reduce the risk of GDM or be the basis for therapeutic treatment to many women with GDM. Physical activity reduces the risk of hypertension in pregnancy and preeclampsia. Physical activity may have both side effects and health effects for women. It might also improve the general physical condition and well-being of pregnant women. Exercises enable the reduction of aches and pains, along with other pregnancy ailments. Physical activity may be associated with easing the labour and stimulate postpartum recovery, as well as the possibility of postpartum depression.

**Keywords:** pregnancy, gestational diabetes, mandatory pregnancy-induced, physical activity

## Effects of the active break intervention on nonspecific low back pain and musculoskeletal discomfort during prolonged sitting among young people: A randomized controlled trial\*

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**Introduction:** Prolonged flexed sitting is a strong predictor of low back pain (LBP). Every end range position maintained for a prolonged time causes a static load on the spine and may lead to musculoskeletal discomfort. The study aimed to evaluate the effectiveness of the Active Break intervention with spine extension program in reducing LBP and perceived low back discomfort during prolonged sitting among young people.

**Material and methods:** A randomized controlled trial was conducted in a group of 50 young people with non-specific LBP. Participants were randomized into groups: experimental group participating in the tested Active Break intervention (AB group, n = 25), and control group (C group, n = 25) with self-administered care recommendations. The experimental group received recommendations to take an active break with the proposed lumbar and hip extension exercises every 30 minutes of sitting or whenever musculoskeletal discomfort occurs. The program took 12 weeks. The outcomes were average pain intensity (Visual Analogue Scale, VAS), disability (Oswestry Disability Index, ODI), perceived low back discomfort (LBD) during prolonged sitting (Borg scale), and global perceived improvement (Global Perceived Effect).

**Results:** VAS, ODI and LBD scores after 12-week intervention were significantly lower than those at baseline in the AB-group. In the C-group, differences were not statistically significant.

**Conclusions:** The 12-week study of the Active Break intervention for young people with non-specific low back pain demonstrated significant improvement. Our research offers valuable evidence-based practices for managing and preventing low back pain, benefiting

individuals, educators, healthcare professionals, personal trainers, and family physicians.

**Keywords:** low back pain, exercise protocol, sitting position

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## Opinions of pregnant women and young mothers on infant participation in water-based physical activity

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**Introduction:** The aquatic environment, although not natural for terrestrial creatures, including humans, is an environment readily used by humans. It owes this to its effect on the body immersed in water. Due to its properties and the resulting beneficial effect on the human body, water is willingly used both for recreation and in the process of rehabilitation (recovery) of people affected by various diseases and ailments. The aim of this study was to obtain the opinions of pregnant women and young mothers towards infant physical activity in water and to analyse the influencing factors. **Material and methods:** The study included 250 pregnant women and mothers of infants. It was conducted using a self-administered, anonymous questionnaire containing closed or semi-open single- or multiple-choice questions. Participation in the study was voluntary and eligibility was purposive. The research was implemented among participants of the birthing school, as well as among Internet users on forums and social networks. The collection of material for the study took place between January and April 2023. Among the potential factors influencing the above-mentioned attitudes, the parent's attitude towards physical activity and one of

its forms such as swimming, the parent's swimming skills and, the parent's level of knowledge about infant swimming were examined.

**Results:** The study found that those more willing to use the pool are more likely to declare their willingness to participate in water-based physical activity with their child, the parent's contact with the aquatic environment from early childhood has a positive impact on their attitude towards infant swimming, better-swimming parents declare a greater willingness to take their infant to the pool, mothers declaring a low level of knowledge about infant water activity issues are afraid to go to the swimming pool with their infants, but this does not affect their attitude towards their children's water activity, the prevalence of swimming lessons has increased in recent years, the topic of infant swimming is more widespread in larger cities.

**Conclusions:** A parent's contact with the water environment in early childhood (before the age of 3) has a positive impact on the parent's attitude towards infant swimming.

**Keywords:** physical activity in water, infant swimming, early childhood development support

## Speed characteristics in the acceleration phase of a sprint run in female soccer players

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**Introduction:** In soccer, one of the most common movements that precedes scoring a goal is to accelerate (sprint) over a short distance. Previous studies have identified three different sub-phases of acceleration in soccer: the early phase (2.5 m), the intermediate phase (6 m) and the late phase (12 m).

**Objective:** The aim of this study was: 1) to compare the velocity of sprinting in sub-phases in a large group of female soccer players, taking into account the role and specific position during the game; and 2) to compare the velocities achieved in each sub-phases of acceleration.

**Material and methods:** The study involved 103 female soccer players aged  $20.8 \pm 5.18$ , representing various age categories and sports levels. The examined players were grouped according to their roles (offensive player – OF, support player – M, defender – D) and specific positions on the pitch (goalkeeper – GK, right defender

– RD, left defender – LD, central defender – CD, central midfield – CM, right midfield (winger) – RM, left midfield (winger) – LM, striker – F). The speed of the sprint race at the distances of 2.5 m, 6 m and 12 m was measured using the STALKER ATS II (Applied Concepts, TX, USA) radar. A one-way ANOVA test was used in statistical analyses. The post-hoc analysis used Tukey's test for unequal counts.

**Results:** Considering the roles and positions on the field, there were no significant differences in the range of running velocities achieved in the different acceleration sub-phases of the sprint run. The analysis of the achieved velocities in the each sub-phases of acceleration showed significant differences between them ( $f = 787.47$ ,  $p = 0.00$ ). A post hoc analysis showed significant differences between each sub-phase ( $p < 0.00001$ ).

**Conclusions:** The role and position on the field in women's soccer were not a factor in the level of speed in short-range acceleration. The running velocities observed in sub-phases of the acceleration were significantly different.

**Keywords:** acceleration, running speed, women's football

## Therapeutic effects of climbing – a literature review

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**Introduction:** A large number of national and international studies have demonstrated the multi-factorial positive effects of therapeutic climbing on patients with health problems and diseases. Climbing provides a whole-body workout that significantly improves muscle strength and endurance, body composition, balance, flexibility, and gait.

**Objective:** The aim of this study is to demonstrate the impact of therapeutic climbing on health in three aspects: mental, physical, and social.

**Material and methods:** A comprehensive analysis of the literature available on the subject was conducted.

**Results:** The literature search was performed by entering keywords separately and in combinations, including terms such as developmental disabilities, children, adults, depression, sport climbing, rope climbing, lead climbing, therapeutic climbing, and bouldering. The

titles of the publications were analysed for thematic consistency. The analysis excluded publications with full text in languages other than Polish or English, post-conference abstracts, letters to the editor, and case studies. The abstracts were then analysed and the full texts of the articles that met the above criteria were examined.

Conclusions: Therapeutic climbing has the potential to enhance and sustain physical, cognitive, and mental performance, while also positively impacting social interaction.

Keywords: climbing, therapy, developmental disorders, mental health

## Functional assessment of physiotherapy and occupational therapy students based on respiratory indicators

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Introduction: As a result of the COVID-19 pandemic, interest in the use of research tools to assess respiratory parameters has increased. The aim of the study was to assess respiratory function in students of the University of Physical Education in Krakow, Faculty of Physical Rehabilitation, who do not practice competitive sports. Materials and methods: 67 volunteers were recruited electronically to participate in the research project. Following the application of exclusion criteria, ultimately 50 female and 5 male students of mean age  $21.7 \pm 1.4$  years and mean BMI  $21.1 \pm 2.3$  were included in the study. The following measurements of the group were made: frequency of breathing at rest and respiratory muscle strength using a MicroRPM device, chest mobility, the back scratch test and an evaluation of resting tongue position.

Results: The average values of the indicators were as follows: number of breaths per minute  $11.37 \pm 3.39$ ; maximum inspiratory pressure (MIP)  $85.15 \pm 26.06$  cm H<sub>2</sub>O; maximum expiratory pressure (MEP)  $84.29 \pm 23.86$  cm H<sub>2</sub>O; maximum inspiratory pressure through the nose (SNIP)  $81.31 \pm 33.15$  cm H<sub>2</sub>O

(inhalation was stronger in 49% of respondents through the right nostril, in 46% through the left nostril, in 5% of the respondents it was equal for the right and left nostril); chest mobility  $8.72 \pm 8.72$  cm, back scratch  $5.9 \pm 3.9$  cm. The ability to verticalize the tongue was found in 91% of participants, and its resting posture in a vertical–horizontal position in 64% of participants.

Conclusions: The functional efficiency of the students as future therapists was characterized by proper mobility, chest elasticity and appropriate respiratory rate at rest. However, some of the surveyed students should undergo respiratory muscle training and re-education on the correct resting position of the tongue.

Keywords: chest mobility, strength of respiratory muscles, resting tongue position

## Physical activity and lifestyle of female students of the Faculty of Health Sciences of the University of Applied Sciences in Tarnow, Poland

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Introduction: Physical activity is a natural need for every human being, provides significant health benefits and adapts the body to effort. Lifestyle is based on conscious choices that influence health. Health-promoting activities such as regular physical activity, healthy and nutritious meals, adequate regeneration, stress reduction in daily life minimise the risk of future behaviour. Objective: The aim of this study was to assess physical activity and lifestyle of female students of the Faculty of Health Sciences of the University of Applied Sciences in Tarnow examined in 2023.

Material and methods: The study was conducted among 167 female students of the Faculty of Health Sciences. Using a diagnostic survey, a questionnaire survey was carried out, the research tool was a survey questionnaire of own authorship, which included questions on physical activity, lifestyle and sociodemographic data.



**Results:** The results indicate that the female students had an active and healthy lifestyle. The vast majority, more than 90%, of the female students surveyed were aware of how physical fitness and their own health-promoting activities and knowledge related to these issues would be important in their future profession. Due to the field of study and the physical activity undertaken, a statistically significant difference was shown ( $p$ -value  $< 0.05$ ), it was the female students from physical education who were the most active among all women, there was no difference between lifestyle and the field of study undertaken.

**Conclusions:** The study group of female students had an active lifestyle, undertook exercise frequently, regularly and spent their leisure time actively. There was no difference between the lifestyle and the field of study and year of study undertaken, and no differences in lifestyle. The vast majority of female students are aware that physical fitness and health activities will be important for them in their future profession.

**Keywords:** physical activity, lifestyle, female students, health behavior

## Monitoring of selected features of somatic structure in adolescent female soccer players

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**Introduction:** Athletic performance can be determined by many factors, e.g., by the tissue components of the body (fat level, muscle mass). In addition, too high or too low levels of fatness can have a negative impact on health. In this light, the monitoring of the most important somatic characteristics among athletes should be considered an essential part of the training process.

**Objective:** The aim of this study was to create practical guidelines for the measurement procedure and interpretation of their results in the field of monitoring tissue components in female soccer players by 1) assessing the level of body height (BH), body weight (BW), percentage of fat tissue (FM), lean body mass (LBM), thickness of skin folds, and body circumference; 2) comparing the consistency of body weight and body fat percentage results of different models of scales from the same manufacturer; and 3) assessing the relationship between the results obtained with the used models of scales and the results of anthropometric measurements (folds and circumferences) in female football players

**Material and methods:** The study involved 16 female soccer players aged  $14.8 \pm 1.3$  years. The measurement procedures were carried out in accordance with ISAK standards. Each measurement on scales (TANITA model BF-730 and TANITA model BF-350), skin folds (arm – triceps, abdomen, in front of the thigh, calf) and circumferences (arm, abdomen, hip, thigh, calf) was carried out three times (the mean value was used for the analysis).

**Results:** The mean values of FM and LBM measured with the use of balances differed significantly ( $p = 0.009$ , and  $p = 0.016$ , respectively). The BW measurements from both scales were most correlated with lower body circumferences ( $r > 0.80$ ,  $p < 0.05$ ). For the BF-730 model, the FM measurement was more strongly correlated ( $r > 0.80$ ,  $p < 0.05$ ) with the skin folds on the triceps and abdomen compared to the BF-350 (where  $r < 0.80$ ,  $p < 0.05$ ). The LBM level measured by both scales was correlated ( $r > 0.80$ ,  $p < 0.05$ ) with hip, thigh and lower leg circumferences.

**Conclusions:** During FM and LBM monitoring, the analyzed scales should not be used interchangeably. Measuring BW with both scales is a good indicator of lower body circumference (hip, thigh, and lower leg) in the studied population. In the junior female soccer players, the BF-350 scale may be a worse indicator of subcutaneous fat level compared to the BF-730 model. In this case, the use of the anthropometric method (measurement of skin folds) may be recommended.

**Keywords:** measurement of tissue components, women's football, women, somatic structure

## The level and structure of the internal load of training session against in comparison to match loads in the women's academic futsal

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**Introduction:** Women's futsal is a discipline that requires very intense efforts divided by short recovery periods.

**Objective:** The aim of the study was to assess the differences between futsal-specific exercises and match load in women's futsal academic competitions, regarding the level of intensity (expressed by the average heart rate) and the structure of the load (expressed by the time spent in different intensity zones).

**Material and methods:** The study involved nine players playing in collegiate women's futsal competitions. The internal load of the analyzed measures was monitored by measuring the heart rate of the athletes and the percentage of time spent in different intensity zones (S1%, S2%, S3%, S4%, S5%). A total of 12 training futsal-specific exercises were analyzed (futsal-specific exercises: tactical-technical without an opponent (Z, n = 5), exercises partly simulating the game, with the opponent (F, n = 3), exercises simulating futsal match (G, n = 4) and 4 futsal matches (M).

**Results:** When comparing the intensity of training measures against the match intensity (M), only significant differences were between time spent in S3% (range 70%–80% HRmax) for Z and F exercises (main effect:  $p = 0.0002$ , post hoc:  $ZvM p = 0.019$ ;  $FvM p = 0.000$ ). There were no significant differences between measures Z, F and G in terms of rest of the zones (S%) and average heart rate (HRavg).

**Conclusions:** In training practice, it can be suggested to use training exercises that are games in full form (GK + 4v4 + GK) due to the lack of differences in terms of average intensity level and time spent in intensity zones compared to match conditions. The training exercises that are not reflected specific demands (without opponent(s), or with opponent but in part-game exercise) may be significantly differ in terms structure of load in compare to the game in the women's collegiate futsal.

**Keywords:** heart rate, exercise intensity, women's academic futsal

## Flip-turn technique for people with disabilities

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**Introduction:** Learning the turnaround increases awareness of body positioning in the water and allows for improved coordination of movements. Biomechanical analysis of the turn-flip helps to determine the parameters of the variables that determine the effectiveness of the technique used, and this is a particularly difficult subject to study in the world of parasport. Each swimmer, despite their assigned sport class, can differ significantly from the other sportsperson in their movement capabilities. The authors therefore attempted to describe the individual ways of performing the somersault by experienced athletes of Tarnów Disabled Sports Association 'Start'.

**Material and methods:** Four swimmers with disabilities representing sports classes S6 and S14 aged 12–22 years were studied. Four cameras (60FPS) were used to analyse the technique, and the videos were processed using the Kinovea 0.9.5 program. Three cameras recorded the sportsmen at the return wall underwater. Two were positioned at the sides and the third at the bottom of the pool, while the fourth recorded the 15-metre line on the surface. Competitors started in series one after the other individually at intervals, covering a distance of 20 m at top speed including a turnaround.

**Results:** The times of covering the 20 m distance including the headland and the durations of the different phases were determined. The following kinematic variables were analysed: distance from the wall during the turnaround, swim speed and rebound speed, immersion depth during the turnaround, contact time with the turnaround wall, and rebound angle.

**Conclusions:** The swimmers with disabilities adapted their flip-turn technique to their motor limitations. Low velocity values during the swim to the turnaround wall resulted in a greater depth of immersion and thus a large angle of rebound from the wall towards the surface. The gliding phase, in which the para-swimmers ascended as quickly as possible to engage their upper limbs, was significantly shortened in the technique of the individuals studied.

**Keywords:** flip-turn, disability, para-swimming, Kinovea

## Sports for disabled people – from rehabilitation to competitive club athlete

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**Introduction:** One of the factors in the development of diseases of civilization is the lack of undertaking or reduction of physical activity. This paper considers the limitation of undertaking physical activity due to acquired or congenital disabilities. The study presents a form of rehabilitation through sports as a thriving direction for an effective form of rehabilitation.

**Objective:** The purpose of the study was to present an interesting and attractive form of rehabilitation through sports for the patient. To discuss the activities of the Tarnów Disabled Sports Association 'Start' Tarnów. To show the increase in the self-esteem of athletes due to active participation in training and membership in the TZSN 'Start' Tarnów sports club on the basis of a questionnaire survey.

**Material and methods:** The study included all male and female athletes of TZSN Start Tarnów from three sections (weight lifting, athletics, swimming) who are at different stages of rehabilitation and competition careers.

**Results and conclusions:** The use of rehabilitation through sports and the implementation of regular physical activity has a positive impact on patients with disabilities. The athletes participating in the study indicated that participation in sports and rehabilitation activities significantly contributes to their self-esteem, acceptance of their body image and sense of efficacy. Through regular physical activity and the introduction of elements of specific sports, this is because we can affect the patient's physical, mental, emotional and social areas simultaneously.

**Keywords:** disabilities, rehabilitation, sports

## Flexibility of selected muscle groups of the lower limbs of young football players in comparison with untrained peers

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**Introduction:** Systematic sports training is associated with high loads and can affect muscle flexibility. **Objective:** The purpose of this study was to evaluate the flexibility of selected muscle groups of the lower limbs of boys who train soccer against non-training peers.

**Material and methods:** The study included 115 boys aged  $13.13 \pm 1.30$ . The training group consisted of 91 boys who have been practicing soccer for at least two years. The control group consisted of 24 boys not training. The following tests were used to evaluate the flexibility of selected muscle groups: Passive knee extension, Silfverskiöld test, Ely test, Ober test.

**Results:** The rectus femoris muscle was more likely to show shortening tendencies in the group of training boys – on the left side (82.42%) and on the right side (73.63%) compared to non-training boys (left side – 54.17%, right side – 41.67%). However, statistical significance for the differences was noted only on the right side. In both groups, reduced flexibility of the ischiofemoral muscles was noted on both sides of the body. In the group of boys training more often in the right limb (92.31%) while in the group not training in the left limb (92%). Decreased flexibility of the gastrocnemius muscles of the calf was noted in slightly more than 80% of the subjects on both sides of the body in both groups, while the ray muscles were noted in more than 90% of the subjects on both sides of the body in both groups. The normal flexibility of the broad fascia stretcher muscle in the group of training boys was recorded in slightly more than 40% of the subjects on the left and right sides of the body, while among the non-training boys the values were slightly higher at 54.17% for the left and 62.50% for the right side of the body. The flexibility of the ischiofemoral muscles, the broad fascia stressor, the broad fascia stressor muscle, the gastrocnemius muscle and the rayon muscle on the

right and left sides of the body did not significantly differentiate the subjects.

Conclusions: The lower values obtained in the Ely test on the right side may be related to specific soccer training. Reduced flexibility of lower limb muscles is commonly observed in adolescent boys, both football-trained and non-trained.

Keywords: muscle flexibility, football players, passive knee extension test, Ely test, Silfverskiöld test

## Body posture of young soccer players aged 11-15 years compared to non-training peers

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Introduction: According to World Health Organization recommendations, children and adolescents should devote at least one hour a day to physical activity. Soccer is one of the most popular activities among young boys. The general opinion is that systematic physical activity is a guarantee of better posture.

Objective: The purpose of this study was to evaluate the posture of boys who train soccer in comparison with their non-training peers.

Material and methods: A total of 112 boys aged  $13.07 \pm 1.29$  were included in the study. The training group consisted of 88 boys who have been practicing soccer for at least two years at a sports school certified by the Polish Football Association. The control group consisted of 24 boys not training. A three-plane assessment of spinal alignment was performed using the Zebis Pointer ultrasonic system.

Results: The subjects did not differ in height, body weight or BMI. In the sagittal plane, slight differences in lumbosacral spine alignment were recorded – almost every third of the subjects in the training group and only 16% of the subjects in the non-training group had normal lumbar spine and sacrum alignment. In the frontal plane, asymmetry in pelvic alignment greater than 5 mm was noted in almost two-thirds

of the trainees and in 45% of the non-trainees, while asymmetry in shoulder alignment greater than 5 mm was observed with comparable frequency in each group (about 70%). In the transverse plane, rotation of the iliac crest greater than 5° was noted in half of the subjects in each group, while rotation of the shoulder girdle in relation to the iliac crest greater than 5° was noted in 46% of those training and 41% of those not training. Lateral curvature of the spine was observed with the same frequency in both groups, also in both groups the curvature was more often to the left.

Conclusions: Systematic soccer training does not significantly differentiate subjects in tri-planar body alignment. Physical activity associated with participation in soccer training should not be considered as prevention of postural defects.

Keywords: posture, football players, physical activity

## Foot disorders in children aged 4-6 years

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Introduction: The contemporary life style, deficient physical activity and improper habits contribute to motion apparatus disorders, including posture faults. Inasmuch those defects bring about no life hazard, they may reduce life comfort due to accelerating degeneration processes and the accompanying disorders. World statistics show that various posture disorders affect about 90% of children. Feet, being an important element influencing body posture, are often subject to factors bringing about changes and deformations of feet that, in turn, disturbs the statics of the motion apparatus.

Objective: To assess the forms and frequencies of foot disorders in children aged 4-6 years, and the consciousness of their parents regarding behaviours leading to such disorders, including directing their attention to the importance of body posture examinations.

Material and methods: A group of 27 girls and 28 boys, aged 4-6 years were studied. The numbers of children aged 4, 5 and 6 years were 17, 19 and 19, respectively.

Methodology: The parents of children studied were requested to fill questionnaires (designed by the authors of this study) pertaining to their awareness of foot disorders. The questionnaire contained 27 questions

– 5 open, 3 semi open, 17 single choice and 2 multiple choice. The children were subjected to conturographic analysis of footmarks in order to assess the foot camber. The alpha, beta, gamma and Clarke's angles were measured and two indices computed: Wejsflog's (W) and Sztriter-Godunov's (Ky).

Results: The most frequent disorders were varus of the 5th finger (91% in the left foot and 96% in the right foot), foot flatness: longitudinal (~30%) and transversal (~32%), hollow foot (10%) and 1st finger valgus (~11%). That latter significantly decreased with age, while varus of the 5th finger and longitudinal foot flatness – increased ( $p < 0.05$ ). No significant relationships between foot disorders and sex or BMI were noted.

Conclusions: In the examined preschool children, the most common foot defects were: the varus of the 5th finger, longitudinal flat feet, hollow foot, transverse flat feet and 1st finger valgus. In order to minimize the risk of their formation, due to the low awareness of parents regarding these issues, educational activities should be expanded in this group in order to increase their knowledge about the possibilities of preventing and correcting foot defects in specialized facilities under the supervision of qualified therapists.

Keywords: foot disorders, foot flatness, children, posture disorders, parents awareness

## Physical activity levels and quality of life for adults

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Introduction: One of the key determinants of life satisfaction and maintaining health is leading a healthy lifestyle with an optimal level of physical activity.

Objective: The aim of the study was to investigate the level of physical activity and quality of life and to determine whether the level of physical activity changes during life and how it affects the improvement of life satisfaction.

Material and methods: The study involved 124 people, 65% women and 35% men from rural and urban areas of different ages. The level of physical activity was assessed using the IPAQ Physical Activity Questionnaire and the WHOQOL-BREF Quality of Life Questionnaire.

Results: A high level of physical activity was declared by 34% of the respondents, more men (43%) than women (29%). A low level of physical activity was declared by 27% of respondents, 29% of women and 23% of men. The level of physical activity expressed in MET-min shows a statistically negative correlation with age ( $p = 0.029$ ). With age, the respondents are more satisfied with the quality of life and their health in women, in contrast to men, in whom these values decrease with age. The average satisfaction score with quality of life is  $3.67 \pm 1.06$  (K  $3.60 \pm 1.04$ , M  $3.79 \pm 1.11$ ), the average health satisfaction score is  $3.52 \pm 1.16$  (K  $3.43 \pm 1.18$ , M  $3.68 \pm 1.13$ ) where the maximum score is 5. The results were obtained in the following domains: somatic domain  $16.2 \pm 2.41$  (K  $15.98 \pm 2.58$ , M  $16.59 \pm 2.04$ ), psychological domain  $11.27 \pm 3.95$  (K  $11.55 \pm 3.93$ , M  $10.77 \pm 3.98$ ), social domain  $14.48 \pm 4.0$  (K  $14.91 \pm 4.03$ , M  $13.70 \pm 3.86$ ), environmental domain  $14.79 \pm 2.79$  (K  $14.66 \pm 2.77$ , M  $15.02 \pm 2.83$ ). There were no statistically significant differences between the sexes in the entire study group and in the age groups. The psychological domain is significantly statistically positive correlated with age in women. In men, the social domain is statistically positively correlated with age and the environmental domain is negatively correlated. A higher level of energy expenditure determined in MET-min is statistically significantly positively correlated with the environmental domain and satisfaction with the quality of life and health in the group of men.

Conclusions: The level of physical activity decreases with the age of the subjects. A greater amount of energy expenditure improves the quality of life and health satisfaction to a greater extent in the group of men.

Keywords: physical activity, quality of life, IPAQ, MET-min, WHOQOL-BREF

## The issue of shoulder pain and the concept of rotator cuff tendinopathy

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Introduction: Pain symptoms of the shoulder joint structures are often overinterpreted and erroneously associated with the increasingly popular term, namely



rotator cuff tendinopathy. Shoulder pain is one of the most common musculoskeletal problems, affecting even over 60% of the general population, which consequently leads to a multitude of therapeutic and surgical interventions. In light of current reports and advanced research methods, efforts have been made to determine the possible causes of shoulder pain, common myths and facts regarding the terminology of painful shoulder, and which physiotherapy interventions may be clinically useful or irrelevant. The anatomical structure of the rotator cuff has been described, and the latest clinical implications related to it have been addressed.

**Material and methods:** A review and analysis of scientific papers from 2000 to 2024 were conducted in scientific databases such as Web of Science, Scopus, Wiley, PubMed, Cochrane, based on MeSH terms: pain, tendinopathy, shoulder, shoulder joint.

**Results:** Improvements in the neuromuscular component such as strength, subacromial space height, scapular kinematics, muscle activity level do not significantly affect the clinical improvement of pain and shoulder function in individuals experiencing shoulder pain.

**Conclusions:** Patient education may prove to be the most important factor in the rehabilitation process of patients with shoulder pain symptoms.

**Keywords:** tendinopathy, shoulder joint, pain

## Awareness of risk factors and health-promoting behaviors in patients after myocardial infarction

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**Introduction:** Myocardial infarction is often a life-threatening condition with a high risk of complications and recurrence. Therefore, the prevention of cardiovascular diseases (CVDs) is important.

**Objective:** The aim of the study was to compare health-promoting behaviors related to the awareness

of risk factors among patients before and after myocardial infarction.

**Material and methods:** The study involved 100 patients (aged 65–100) after their first myocardial infarction. The diagnostic survey method was used – authors' own questionnaire. Statistical analysis was performed using Statistica 7.1.

**Results:** The risk factors for CVDs in the respondents were: hypertension (70%), diabetes (19%), hyperlipidemia (48%), nicotine addiction (74%), overweight (82%). After myocardial infarction, knowledge of dietary recommendations significantly improved (45% vs 82%,  $p < 0.0001$ ). Patients reduced the amount of fat in their diet (20% vs 82%,  $p < 0.0001$ ), salt (13% vs 44%,  $p < 0.0001$ ), increased the amount of fruit (48% vs 68%,  $p < 0.0001$ ) and vegetables (42% vs 75%,  $p < 0.0001$ ). Alcohol consumption (24% vs 70%,  $p < 0.0001$ ) and tobacco smoking (74% vs 6%,  $p < 0.0001$ ) were reduced. The percentage of daily physical activity increased (12% vs 46%,  $p < 0.0001$ ). The percentage of patients regularly measuring blood pressure (BP) also increased (62% vs 94%,  $p = 0.08$ ), knowing the correct BP values (88% vs 94%,  $p = 0.35$ ) and testing lipid profile (19% vs 43%,  $p < 0.001$ ). Moreover, only 32% of patients underwent rehabilitation cardiology.

**Conclusions:** Among patients after myocardial infarction, health-promoting behaviors related to the awareness of risk factors for next myocardial infarction changed significantly. The results indicate the need for therapeutic education in the field of modification of cardiovascular risk factors.

**Keywords:** myocardial infarction, cardiovascular diseases, health prevention, health-promoting behaviors

## Effects of systemic vibrotherapy on selected parameters of body composition and subjectively perceived quality of life in young, non-training women

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**Introduction:** Overweight and obesity are a very worrying and growing health problem. Medical science is increasingly looking for effective ways to combat the

effects of the disease, not only at the level of physical health, but also in other dimensions of human health, such as mental health and social function. A promising form of therapy in this area is vibration therapy.

**Objective:** The aim of the work was to evaluate the influence of systemic vibrotherapy on selected parameters of body composition and on the subjectively perceived quality of life in young, non-training women.

**Material and methods:** The research was a pilot study. The study involved 22 women. Before and after 30 minutes of daily vibrotherapeutic treatment for a period of 4 weeks, body composition was measured with the Tanita analyzer, which uses innovative electric bioimpedance technology (BIA). In addition, the participants completed the SF-36 questionnaire on quality of life assessment before and after a series of vibrotherapies.

**Results:** After a series of systemic vibrotherapies, lower average body mass index, Fat %, FatMass,, BMI, VFR, FFM and BMR values of the women studied were achieved than before the series. The decrease in indicators was shown to be associated with vibrotherapy, as the study group included healthy, untrained and non-dietary women. Of particular note is the decrease in BMI and VFR, which was significant in view of the short investigation period. The TBW and TBW rates increased slightly, which can also be classified as positive effects of the therapy. The subjective assessment of quality of life was not significantly changed in the study group, apart from the area of well-being, which showed a slight improvement in 54% (12 women in the 22-person group).

**Conclusions:** Oscillatory-cycloidal vibrotherapy can be an effective tool to normalize the level of parameters of body composition and to combat obesity. The positive effect of vibrotherapy on the subjectively perceived quality of life of the subjects is also pointed out.

**Keywords:** systemic vibrotherapy, body composition parameters, female, quality of life

## Assessment of knowledge and attitudes of nursing staff in Intensive Care Units regarding persistent therapy

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**Introduction:** In modern times intensive care has an increasingly advanced diagnostic and therapeutic methods which allow for a life-threatening condition therapy, overturning and prolonging human life. Unfortunately, such intensive therapy not always leads to an improvement of patient's clinical condition, moreover, in case of chronic and incurable disease, without giving any benefits, very often becomes burdensome for the patient and their family, taking on signs of persistent (futile) therapy. **Objective:** The aim of this study was to evaluate knowledge and attitude of the nursing staff of intensive care units towards persistent therapy. **Material and methods:** The study was carried out in a period from 15 of November to 15 of December 2022 in the form of online survey on a group of 105 people amongst nursing staff of intensive care units in hospitals with a different reference levels. The method of diagnostic survey with the usage of self-questionnaire technique in electronic form was used in the study. In the selection of a specific sample of online research, the method of recruiting volunteers was used.

**Results:** Most of respondents gave correct answers in questions which tested the knowledge about persistent therapy and correctly interpreted the renouncement from it, however only some (38%) have had knowledge about documentation associated with the decision of its limitation. All of the survey participants (99%) have experienced practicing therapeutic actions with the signs of futile therapy in their workplace. Most common causes for it were pressure from patient's family, physicians' fear of the consequences, moral dilemma of medical staff and legal inaccuracies.

**Conclusions:** Intensive care units nursing staff had a satisfactory level of knowledge about persistent therapy. The problem associated with knowledge of documentation regarding futile therapy renouncement was revealed. Most of nursing staff members evaluated that persistent therapy is negative for the patient and their family.

**Keywords:** persistent therapy, futile therapy, nursing staff, intensive care unit

## Effects of selected manual therapy techniques on the lower limbs' weight bearing symmetry and body balance in healthy young adults

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**Introduction:** This study explores the realm of manual therapy and its impact on body symmetry.

**Objective:** The study aims to assess the efficacy of manual interventions in reinstating the symmetry of weight bearing in the lower limbs and to examine the correlation between the symmetry of weight bearing and static balance.

**Material and methods:** A total of 273 participants, consisting of 170 women and 103 men aged 18 to 30 years, participated in the study. This included 127 participants with symmetrical weight bearing in the lower limbs, where the difference in weight bearing between the right and left lower limbs did not exceed 5% of body weight (Ks, Symmetrical Control group), and 146 participants with asymmetrical weight bearing in the lower limbs. The latter group was randomly divided into four groups: K group (39 participants who underwent mobilization of the sacroiliac joint using the Kowtun method), MG group (32 participants who underwent global manipulation of the cervical spine), MC2 group (29 participants who underwent manipulation of the cervical spine at the C2 level), and Ka group (46 participants who received no therapy). All participants were

tested three times: at the beginning of the experiment, immediately after the manual treatment (or 10 minutes after the first test for groups Ks and Ka), and after two weeks. The analyses included the functional length of the lower limbs, the difference in left and right lower limb weight bearing in habitual standing, the index of symmetry of the lower limbs' weight bearing, and static balance, measured using the P-walk balance platform. Data were analysed using Statistica v.13.

**Results:** Manual treatments significantly improved the symmetry of weight bearing in the lower limbs and static balance.

**Conclusions:** Manual treatments result in significant improvements in both the symmetry of lower limb weight bearing and static balance, with effects observed immediately after treatment and persisting for at least two weeks. Cervical spine manipulation targeting the C2 segment, global manipulation of the entire cervical spine, and pelvic mobilization all yield comparable effects, indicating that these different

**Keywords:** body weight bearing symmetry index, manipulation, mobilisation, lower limb functional length, balance

## Comparison of pain intensity and functional disability in patients with degenerative changes in the cervical and lumbar spine

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**Introduction:** Low back pain (LBP) has become an epidemic nowadays, and is one of the main reasons for visiting a family doctor.

**Objective:** The aim of the following study was to determine whether there are differences in the intensity of pain and the degree of functional disability in

patients with degenerative changes in the cervical and lumbar spine.

**Material and methods:** The research material included 877 patients. The study group included 427 (49%) women and 450 (51%) men aged between 15 and 85 years (average 50.27 years). The following research tools were used in the work: visual analogue scale (VAS), Neck Disability Index (NDI), Oswestry Disability Index (ODI).

**Results:** Of all patients with degenerative changes in cervical spine, 71% were women and 29% were men. The observed difference was statistically significant. In the group with degenerative changes in the lumbar spine, the degree of functional disability was 27.1, while in patients with changes in the cervical spine it was 24.3. The observed difference turned out to be statistically significant. There were no statistically significant differences in the intensity of axial pain and pain radiating to the limbs between both groups of patients. **Conclusions:** A statistically significant higher incidence of degenerative changes in the cervical spine was observed in women than in men. The severity of functional disability was higher in the group of patients with degenerative changes in the lumbar spine. No differences were observed in the intensity of axial pain in the group of patients with degenerative changes in the cervical and lumbar spine. No differences were observed in the intensity of sciatic pain in both groups of patients.

**Keywords:** neck pain, low back pain, degenerative changes in the spine, disability

## Text analysis of the collection Code of Professional Ethics of Nursing and Postnature of the Republic of Poland and Code of Professional Ethics of the International Council of Nursing as seen by nursing students of the University of Rzeszow 2021/2022

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**Introduction:** This paper is concerned with presenting a textual analysis of essays from the collection: Code of Professional Ethics of Nursing and Postnature of the

Republic of Poland and Code of Professional Ethics of the International Council of Nursing as seen by nursing students of the University of Rzeszow 2021/2022.

**Objective:** The purpose of this study was to present an analysis of the published essays of the students. **Material and methods:** Research tools used: author's text analysis sheet. Research techniques used: qualitative text analysis, frequency analysis of statements.

**Results:** 58% of essay authors wrote about the meaning of nurses' professional codes directly, and 42% indirectly; essay authors used words describing the patient's subjectivity 124 times (patient(s) – about 46%; patient(s) – about 23%; human(s), related terms – about 22%; client(s) – about 18.5%; person(s) – about 5%; recipient(s) of activities, object(s) of care, woman – about 2.5%; subject(s) of care/activity – about 1.5%); authors wrote about: about 83% about teamwork; about 66% about treating a colleague properly at work; about 83% about self-development/self-education; 75% about taking care of the image of the profession. Each of the authors addressed several issues in their papers. **Conclusions:** Nursing codes of ethics have an important function in shaping nursing students' opinions on professional performance; however, there are individual differences.

**Keywords:** ethics, code of ethics, code of professional ethics for nurses, nursing students, nursing

## Assessing physiotherapy students' satisfaction and training evaluation: A focus group study

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**Introduction:** Physiotherapy education is a dynamic field, demanding a blend of theoretical knowledge and practical skills acquisition. Understanding students' perspectives on their education can highlight areas of strength and areas ripe for improvement within the curriculum.

**Objective:** The primary aim of this research is to explore the satisfaction levels and training evaluation of

physiotherapy students about movement analysis education using focus group interviews.

**Material and methods:** This research was carried out within the KA220-HED – Cooperation partnerships in higher education project. Focus group interviews were conducted with three groups of students, totalling 31 participants. All groups were asked the same questions about their education to obtain a comprehensive understanding of the factors influencing skill acquisition.

**Results:** Across all year groups, students' opinions were generally similar, yet noticeable differences emerged between the different year groups. Students expressed a preference for online teaching in theoretical subjects, while they favoured face-to-face teaching and immediate feedback from lecturers for basic subjects. Content enriched with videos and animations, facilitating review, and practice and problem-solving exercises was strongly favoured. Senior students, who had experienced online lessons during the pandemic, felt somewhat disadvantaged despite the availability of video materials and presentations. They highlighted the importance of practical opportunities, regular situational exercises, and the need to develop communication and situational skills in practice areas. Regarding units delivered by various lecturers, students found it beneficial to learn different styles but sometimes found it challenging to reconcile certain variations. They also expressed a desire for a single, systematic source of literature to aid in their preparation.

**Conclusions:** Overall, students expressed satisfaction with the knowledge gained, though they perceived that the application of skills might transpire at a later stage, post-examination success. It is the responsibility of lecturers to review the information gained and incorporate it effectively into the curriculum. The focus group interviews suggest that students are highly motivated and eager to understand course materials, yet they require additional practical lessons to attain the necessary skills before completing their training.

**Keywords:** education of physiotherapists, professional training

## Diabetes – a civilization-related metabolic disease

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**Introduction:** Diabetes is a group of metabolic disorders characterized by hyperglycemia resulting from a defect in insulin secretion or action. Chronic hyperglycemia in diabetes is associated with damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels.

**Objective:** The paper will discuss a civilization-related disease that is worth further exploration due to its high frequency. Diabetes is a social disease – its morbidity exceeds 1% and is constantly increasing. According to forecasts, it is predicted that by 2030 there will be 360 million people worldwide affected by diabetes. Morbidity is increasing in all age groups, with the greatest increase seen in middle-aged individuals. The UN has recognized diabetes as a non-communicable epidemic disease. The paper will present the clinical picture and diagnosis of the disease.

**Material and methods:** Analysis of books and articles on the disease entity.

**Results:** There are various types of diabetes, the most common being: Type 1 Diabetes, Type 2 Diabetes, Gestational Diabetes, and other types. Subjective symptoms are nonspecific and varied, depending on the type of diabetes and the dynamics of the disease. Typical symptoms of diabetes include polyuria, increased thirst, weakness, and drowsiness due to dehydration. Diabetes treatment is comprehensive and requires the implementation of several methods such as therapeutic education, dietary treatment, pharmacological treatment, and physical activity. Non-pharmacological management is as important as pharmacotherapy and involves implementing a healthy lifestyle.

**Conclusions:** It is an incurable disease; however, early detection and appropriate preparation significantly increase the quality of life during the fight against the disease. It is estimated that around 5 million people in Poland suffer from diabetes.

**Keywords:** diabetes, civilization disease, hyperglycemia, social disease



## Anxiety severity of patients in the perioperative period — a preliminary study

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**Introduction:** Stress associated with surgery is a major psychological burden and has a significant impact on the treatment process and recovery period.

**Objective:** The main aim of this study was to assess the severity of anxiety and factors affecting it in a group of patients undergoing surgical treatment.

**Material and methods:** For the purposes of this study, a diagnostic survey method was used. The research technique was a questionnaire, and the research tools were a self-administered survey questionnaire and the SL-C Scale. The survey was conducted between December 2022 and March 2023, among patients of the General Surgery Department of one of the hospitals in Małopolska. The study group consisted of 105 adults qualified for surgery who gave informed consent to participate in the study.

**Results:** The largest group consisted of people admitted in emergency conditions requiring surgical intervention. The majority were women, and people aged between 51 and 70 years. Analysing the severity of perceived anxiety related to perioperative procedures and the operation itself, it was found that each of the subjects experienced anxiety. An increased level of anxiety was declared by the respondents before surgery (49.5% of patients), before anaesthesia (52.3% of respondents), before pain (69.5% of respondents), or before complications (58.0% of patients). A higher degree of perceived anxiety before surgery was indicated by women, older patients, those being prepared for general anaesthesia, those admitted under emergency surgery and those operated on using the classic method.

**Conclusions:** The level of perceived anxiety before surgery, anaesthesia, pain or complications was intense and varied according to gender, age, type of anaesthesia, mode of hospital admission and surgical method.

**Keywords:** anxiety, surgery, pre-operative anxiety

## Optimization of positions for isometric exercises strengthening the semimembranosus and semitendinosus muscle of the thigh based on sEMG

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**Introduction:** Semimembranosus and semitendinosus muscle belong to ischio-shin muscle group. Their main function is flexing the knee joint and cooperation with other muscles that are extending the hip joint. Due to the fact that this muscle is taking part in activation of two joints they are more liable on more frequent injuries. Injuries occur when muscles are overloads for examples when someone is performing dynamics run and springs. Also, traumas appear without correct preparation of muscle and ligament structures to activity. To avoid muscle injuries or help this structure to recover the most important thing is well planned physiotherapy, which enable the selective strengthening of muscle structures.

**Objective:** The aim of study was to evaluate and assign the initial position for semitendinosus and semimembranosus muscle which will display the highest bioelectrical activity. This study was to indicate in which position of lower leg regarding to semitendinosus and semimembranosus muscle they will be strengthen the most effectively.

**Material and methods:** The study group was composed of 25 participants – students of Collegium Medicum of Jagiellonian University. Each semitendinosus muscle was evaluated in every participant which gave the number of 50 cases. Due to exclusion criteria there were 49 classified cases to statistical analysis. Semitendinosus and semimembranosus muscle bioelectric

activity was evaluated by using the surface electromyography – sEMG. Procedure of this study was consistent with SENIAM recommendations. The research was performed in two initial positions of the lower leg. The first initial position was pronation of lower leg and foot, and the second position was neutral. In both positions knee joint was flexed to 45 degrees. The procedure of this research was performed on the BIODEX device in position that participant was laying on his front part of the body. In this research the muscle the muscle was in isometric contraction with resistance. Bioelectric activity of muscle was evaluated for three times in each of the initial position. In this study was measured: mean value of muscle activity [ $\mu\text{V}$ ] and maximum value of muscle activity [ $\mu\text{V}$ ].

**Results:** The analyzed data indicate that both the average and maximum values of bioelectrical activity of the examined muscles are higher during internal rotation of the lower leg and foot compared to the neutral position. The average bioelectrical potential obtained in the rotational setting is 240.5 [ $\mu\text{V}$ ] ( $\pm 105.5$ ), while the average value in the neutral position is 211.5 [ $\mu\text{V}$ ] ( $\pm 82$ ). The difference in the average muscle activation depending on the position of the lower leg is 29 [ $\mu\text{V}$ ]. For the second examined parameter – maximum activation value – a statistically significant difference was also obtained. The average maximum muscle activation in the internal rotation position is higher at  $M = 366.1$  [ $\mu\text{V}$ ] ( $\pm 170.0$ ), whereas in the neutral position it is 325.3 [ $\mu\text{V}$ ] ( $\pm 133.2$ ). The difference between the average maximum activation values is 40.8 [ $\mu\text{V}$ ]. The statistical significance of both examined parameters was confirmed using the t-test for dependent samples and was  $p < 0.01$ .

**Conclusion:** The highest bioelectric activity of semitendinosus and semimembranosus muscle is performed while lower leg and foot is in pronation. While there is a shortage of strength and muscle mass of these muscles a good option for strengthening a muscles will be isometric exercises when the lower leg and foot is in pronation.

**Keywords:** semitendinosus muscle, semimembranosus muscle, surface electromyography, bioelectric activity, muscle activity

## Occupational risk of a nurse in the context of viral hepatitis prevention strategies

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**Introduction:** Among the threats at a nurse's workplace there are biological factors that increase the risk of contracting infectious diseases. Hepatitis B and C is one of the most frequently diagnosed occupational diseases. The chronic form of hepatitis B can lead to cirrhosis of the liver, as well as hepatocellular carcinoma and end in death.

**Objective:** The aim of the study is to present the prevention from viral hepatitis among nurses in the context of prevention strategies, diagnostics and therapeutic interventions. **Material and methods:** The research method is the analysis of documents – hepatitis prevention strategies at the local, regional, national and global levels.

**Results:** The most important aspect in preventing occupational diseases are preventive vaccinations against hepatitis B, which reduce the risk of developing the disease. Vaccinations should be carried out during the training of future nurses due to daily exposure and activities that involve the possibility of infection with these harmful biological agents.

**Conclusions:** Occupational disease prevention from hepatitis B and C in the position of a nurse includes compliance with procedures at work stations, occupational risk assessment, keeping a register of work and employees exposed to these factors. The lack of vaccinations against hepatitis C limits the possibilities of prevention, hence it is important to intensify educational activities and follow the rules when performing medical procedures.

**Keywords:** viral hepatitis (hepatitis), nurse, occupational risk, prevention

## The influence of a vegetarian diet on hypertension

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In today's society, an increasing number of individuals are opting for a vegetarian diet not only for ethical reasons but also due to its potential health benefits. One area where a vegetarian diet may have an impact is hypertension, a significant health issue in Poland, affecting one in three individuals. This abstract aims to highlight the influence of a vegetarian diet on hypertension, considering the findings of recent scientific research and the underlying mechanisms of this relationship. Evidence suggests that a well-balanced vegetarian diet, rich in vegetables, fruits, nuts, seeds, and plant-based products, may contribute to lowering blood pressure by reducing body weight, improving lipid profiles, regulating sodium-potassium balance, and reducing oxidative stress. Studies have shown that individuals abstaining from meat consumption had lower systolic blood pressure by an average of 6.9 mm Hg and lower diastolic blood pressure by an average of 4.7 mm Hg compared to those consuming meat. Additionally, a vegetarian diet may be associated with lower salt intake and a reduced risk of cardiovascular diseases, which often accompany hypertension.

Keywords: blood pressure, cardiovascular diseases, diet, eating habits

## The world in the face of civilization diseases – simulation in health care as a way to improve the quality of care

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Introduction: There is growing scientific evidence in the literature supporting the effectiveness of simulation

in healthcare as a tool to impact healthcare quality and patient safety. In addition to improving communication or teamwork skills, simulation is also used to improve practical/technical skills. Given the rate of development of civilization diseases, the quality of care should meet the highest criteria on the part of both personnel and the health care system.

Objective: The purpose of this paper is to present simulation in health care as an important element affecting the quality of care provided to patients with selected civilization diseases such as diabetes and high blood pressure.

Material and methods: A non-systematic literature review from 2014–2024 was conducted.

Results: Medical personnel are expected to be competent and effective. Due to the rapidly changing model of healthcare delivery, both providers and care recipients face the additional challenge of keeping up with the latest standards of care. The CanMEDs (manager, communicator, professional, scientist, expert, health advocate and collaborator) framework, developed in the 1990s, indicates the skills needed by health care professionals to deliver quality care. Research conducted in 2014–2024 clearly demonstrates the fact that simulations have a real impact on the quality of treatment of selected civilization diseases, providing feedback for treatment providers.

Conclusions: Quality of health care and patient safety are fundamental pillars directly influenced by health care professionals. It is worth implementing simulation-based education as early as the education stage, and improving early detection skills for civilization diseases based on the CanMEDs framework will create the opportunity to provide the highest possible level of care, which will directly translate into efficiency and effectiveness of care.

Keywords: quality of care, patient, simulation, lifestyle diseases

## Chatbots as educational tools – the use of artificial intelligence in the prevention of lifestyle diseases

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Introduction: Lifestyle diseases such as heart disease, type 2 diabetes and cancer are a serious health problem

around the world. Prevention is key to combating these diseases, and education plays a key role. Chatbots are programs whose task is to simulate conversations with people. Chatbots replicate human behavior, for example by automating answers to repetitive questions. They are developed using big data so that they can carry on a conversation and engage on a variety of topics. The number of chatbots in the world is constantly growing, and they are also developing dynamically in terms of capabilities. More and more people use these programs as a source of knowledge, including health knowledge

**Objective:** The aim of the work is to analyze the potential of chatbots based on artificial intelligence (AI) as educational tools in the prevention of lifestyle diseases  
**Material and methods:** The advantages of using chatbots in the prevention of lifestyle diseases are: availability: Chatbots are available 24/7, which means that people can access them at any time of the day or night; scalability: Chatbots can reach large groups of people at the same time, which makes them an effective educational tool; personalization: Chatbots can adapt their messages to the individual needs and preferences of users; interactivity: Chatbots can conduct interactive conversations with users, which makes learning more engaging and enjoyable; Engageability: Chatbots can use games, quizzes, and other features to keep users engaged. Challenges in using chatbots in the prevention of lifestyle diseases: ensuring the reliability of information: it is important that the information provided by chatbots is based on reliable scientific sources; ensuring data security: personal data of chatbot users should be protected; increasing engagement: it is important that chatbots are engaging for users to encourage them to use them.

**Results and conclusions:** Chatbots can be a valuable educational tool in the prevention of lifestyle diseases. They have many advantages over traditional education methods, such as accessibility, scalability, and personalization. However, there are also several challenges that need to be overcome to fully realize the potential of chatbots in this field.

**Keywords:** chatbot, artificial intelligence, lifestyle diseases, health education

## Project Mov-e as an example of a remote course aimed at improving competencies in movement analysis and intercultural communication

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**Introduction:** Globalization and digitization pose challenges but also opportunities for the education and enhancement of physiotherapists' competencies – both in terms of professional qualifications and intercultural communication.

**Objective:** The aim of this paper is to present an e-learning course targeted at students, academic teachers, and professionals working in the field of physiotherapy. **Materials and methods:** The assumptions and stages of the Mov-e Project will be discussed: Development of Intercultural Communication Skills in Physiotherapy Practice Through an E-learning Course on Movement Analysis and Therapy.

**Results:** Based on the analysis of available courses conducted by teams from Poland, Hungary, Finland, Turkey, and Spain, as well as the opinions of physiotherapists working with patients, educators, and physiotherapy students, 15 topics were selected. Each topic consists of online lessons, educational videos, materials for self-study, and supplementary content (e-books). Each lesson contains information on both professional and communication skills. Participants who pass the final test will receive a personalized certificate.

**Conclusions:** High-quality online courses have the potential to be one of the tools for improving physiotherapists' professional qualifications. Courses developed by international teams allow for a multi-aspect view of the diagnostic and therapeutic process, as well as preparation for working with patients considering communication needs in different cultural aspects.

**Keywords:** teaching, physiotherapy, e-learning, intercultural communication

## Analysis of the incidence and effectiveness of early postoperative rehabilitation of selected typical postoperative complications occurring after classic and extended modified radical hysterectomy in the course of early forms of cervical cancer and endometrial cancer with the use of the Da Vinci robotic system as part of a research grant “Conducting research and development (R+D) work on a new therapeutic method and validation and implementation of TMMR robotic surgery in the treatment of cervical cancer and robotic PMMR in the treatment of endometrial cancer” carried out by NEO Hospital – Szpital na Klinach in Krakow in 2021-2023

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**Introduction:** Early systemic rehabilitation in patients after modified radical hysterectomy in the course of endometrial cancer and cervical cancer with the use of the Da Vinci robotic system – in the PMMR (Peritoneal Mesometrial Resection) and TMMR (Total Mesometrial Resection) methodologies is aimed at: minimizing the risk of thrombotic and embolic lesions, rapid improvement and avoidance of selected typical postoperative undesirable symptoms such as: micturition control disorders, fecal and gas incontinence disorders, urinary retention, lack of bladder urgency, constipation, lymphoedema of the lower abdomen, lower limbs and sometimes even upper limbs and deep sensory disorders in the lower limbs, locomotion difficulties

associated with neuromuscular conduction disorders. Early postoperative rehabilitation was started as early as 6 hours after surgery.

**Objective:** to determine the incidence of postoperative complications typical of modified radical hysterectomy, as well as the degree of their severity and the dynamics of their resolution after the implementation of early postoperative rehabilitation procedures in patients.

**Material and methods:** The study group consisted of 123 patients qualified for surgery with the use of the Da Vinci robotic system – in accordance with the standards applicable in the field of gynecologic oncology. A total of 21 patients with cervical cancer were operated on, including 14 patients using the TMMR methodology, and 7 patients undergoing classical surgery. There were 92 patients with endometrial cancer: 34 were performed in PMMR and 58 patients underwent classic modified radical hysterectomies.

**Results:** A higher incidence of these complications was demonstrated in patients undergoing PMMR and TMMR procedures compared to classic hysterectomies, as well as the absolute legitimacy of the implementation and use of early postoperative rehabilitation procedures.

**Keywords:** da Vinci robot, postoperative complications, postoperative rehabilitation, cervical cancer, endometrial cancer

## Analysis of Internet users' interest in mental health over the past decade

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**Introduction:** Depression, anxiety, and disorders of positive self-image pose are a major public health problem. The main causes of mental health disorders include low self-esteem, traumatic events, discrimination, lack of freedom of speech, and even genetic factors. Mental health information is currently one of the most popular topics searched for on the Internet. Many people seek information about mental health



when they experience symptoms that they do not understand or do not know how to interpret.

**Objective:** The aim of this work is to analyze the trend of internet users' interest in Poland in keywords related to mental health. **Materials and methods:** The tool used in the research was the Google Trends service: a service that provides information on the number, origin, time dependence and main regions of queries sent to Google. The period from March 10, 2014 to March 10, 2024 was analyzed. The study was conducted from March 11 to 13, 2024. 14 keywords related to mental health were analyzed.

**Results:** The research showed a clear upward trend in the years 2014–2024 for the keywords: “mental health”, “psychologist”, “psychotherapist”, “psychiatrist”. The peak of interest (100 on the GT scale) for these phrases was noted: October 2023 for the keyword “mental health”, February 2022 for the keyword “psychologist”, January 2024 for the keyword “psychotherapist”, March 2023 for the keyword “psychiatrist”. Interestingly, the interest in the phrase “postpartum depression” has been constantly high, reaching its peak popularity in August 2020. The keyword “neurosis” has also been searched at a similarly high level for the past decade, with the peak of interest noted in 2020 (100 on the GT scale). Data analysis showed that in the case of 50% of the analyzed keywords, an increase in interest was noted during and just after the COVID-19 pandemic. These were the keywords: “mental health”, “psychotherapy”, “anxiety”, “psychologist”, “psychotherapist”, “psychiatrist”, “what are the symptoms of depression”.

**Conclusions:** In recent years, there has been a growing interest in mental health in Poland. The high and constantly increasing interest in the keywords “psychologist”, “psychotherapist” and “psychiatrist” indicates a great need for access to specialists in this area. The particularly high interest in 2020 for the keywords “postpartum depression” and “neurosis” may be related to the negative impact of the COVID-19 pandemic on people's mental health. The high level of searches for mental health keywords over the past decade suggests that these problems are widespread and require constant monitoring and preventive action. Google Trends can help identify growing mental health problems, allowing for faster response and implementation of appropriate actions. Google Trends is a valuable tool for tracking internet users' interest in mental health. However, it is important to be aware of its limitations and to use it in conjunction with other research methods.

**Keywords:** mental health, depression, psychotherapist, anxiety disorders

## Changes in the percentage of body fat and the Body Mass Index in children aged 11-13: Comparative analysis of the situation in the years 2017 and 2023

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**Introduction:** According to the 2022 report by the World Health Organization, 29% of boys are overweight or obese. Technological development and the resulting reduction in the interest in active forms of spending free time are one of the reasons why children struggle with extra kilograms.

**Objective:** The aim of the study was to assess the differences in the percentage of body fat and Body Mass Index (BMI) among boys aged 11–13 in 2017 and 2023. The study was conducted among: a) a group of boys who did not declare physical activity at least three times a week: 85 people in 2017 and 43 people in 2023; b) a group of boys practising judo: 39 people in 2017 and 51 people in 2023. The analysis included the measurement of body height, body weight and percentage of body fat. Body height (cm) was measured using an anthropometer with the accuracy of 1 cm. Body weight and its composition were determined using the Tanita TBF-551 body composition analyzer.

**Results:** The results were divided into three groups and compared according to the age of the study participants: 11-year-olds, 12-year-olds and 13-year-olds. Among non-training children, no statistically significant differences were found in the percentage of body fat and BMI in any of the studied groups. Among children practicing judo, the results did not show any statistically significant differences in the groups of 11-year-olds and 12-year-olds. In the group of 13-year-olds, statistically significant differences ( $p < 0.001$ ) were found in favor of the group tested in 2023, both for the percentage of body fat and the BMI.

**Conclusions:** Despite numerous disturbing indications about the increasing problem of overweight and obesity among children, the study results did not show a significant increase in the percentage of body fat and BMI. Nevertheless, there is still an undeniable problem

with excessive kilograms among children, which is confirmed by the reports from World Health Organization (WHO), Health Behaviour in School-aged Children (HBSC), International Obesity Task Force (IOTF) and Polish Society for the Treatment of Obesity (PTLO).

Keywords: BMI, obesity, overweight, children aged 11–13, body fat percentage, time trends

## Caring for a patient with invasive breast cancer after mastectomy

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**Introduction:** Cancers with the advancement of civilization have not regressed sufficiently. In 21st century we attach importance to prevention mostly. Disease treatment is mainly based on through chemotherapy and surgery. This paper reports case study of a patients with invasive breast cancer (NST) G2. A 55 years old female patient while taking a bath discovered a collapsing nipple that caught her attention. Thanks to the knowledge she already had the patient went to gynecologist. After the medical visit the woman underwent chemotherapy and a total mastectomy of the right breast with reconstruction. The operation ended without complications and the patient returned home. She remains under oncological care.

**Objective:** The paper main objectives were to show challenges which come with the diagnose of breast cancer for the patient. Also to highlight the problem of insufficient knowledge in the field of self-control and low interest of prevention.

**Material and methods:** Materials from patient medical history, epicrisis, medical and nursing interviews were used to write the thesis. The work also uses interviews with relatives from the patient's environment as well as professional literature and medical studies.

**Conclusions:** Breast cancer is the most common type of cancer among women. The patients are diagnosed too late when the tumor is in an advanced stage. High quality of patient care make the recovery process better and is a base of patient protection and support. A holistic approach to the oncological patient is important.

Keywords: breast cancer, invasive cancer, mastectomy, nursing care, prophylaxis

## Analysis of functionality of selected mobile applications regarding lactation

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**Introduction:** Breastfeeding can be a challenging process, especially in the first few weeks. During this time, when new mothers may not yet recognize when the baby needs feeding or whether there is enough milk, mobile applications related to lactation become immensely helpful. The applications are available 24/7 and can be used anytime, anywhere.

**Objective:** The aim of the study is to analyze the functionality of selected mobile applications regarding lactation.

**Material and methods:** The study analyzed the correctness and functionality of 8 most popular mobile applications regarding lactation in the Polish language available for the Android system, downloaded from the Google Play Store. Each application has over 10,000 downloads. Applications with a rating of over 4.5/5 stars were selected. The analysis was conducted on 10.03.2024.

**Results:** The most popular features in the selected applications are: breastfeeding diary (8/8), diaper usage diary (8/8), monitoring of the child's health and physiological needs (8/8), developmental diary (8/8), sleep diary (8/8), data analysis, and pattern search (8/8). All selected applications have these functions. As many as 87.5% of applications have the function of recording expressed milk and stored milk (7/8) and a child's activity diary (7/8). The function of a nutrition diary is present in 62.5% of applications (5/8). Reminder about vaccinations and medical appointments is available in 50% of mobile applications (4/8), and potty training and teething diary are present in 37.5% of applications (3/8). Creating memories is possible only in two selected applications – 25%.

**Conclusions:** 1) Breastfeeding applications offer a wide range of features that can help moms monitor their baby's feeding, development, and health 2) The most popular features in the selected applications focus on basic aspects of child care. 3) There is a lack of applications developed by medical specialists devoted

comprehensively to lactation. 4) When choosing an application, attention should be paid to the reliability of the information contained.

Keywords: mobile applications, lactation, women's health, newborn

## Evaluating the correctness of answers generated by artificial intelligence about pregnancy

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**Introduction:** With the development of artificial intelligence (AI) technology, its potential in various fields, including health care, is growing. One area where AI can have a significant impact is in the provision of pregnancy information. AI-based language models can generate content about pregnancy, answering users' questions and providing them with necessary information.

**Objective:** The purpose of this study is to evaluate the accuracy of AI-generated answers about pregnancy.

**Material and methods:** The study used three publicly available and free chatbots: Gemini, ChatGPT 3.5 and Perplexity. A three-person team consisting of 2 midwifery students and the tutor of the student scientific association, selected a set of 13 pregnancy questions (the popularity of the questions was assessed through the Google Trends tool). Each of the 13 questions was individually entered into each of the three chatbots. We then asked a group of 23 midwives to rate the answers generated by the chatbots to these questions for correctness on a 5-point Likert scale.

**Results:** All three language models correctly answered the 13 questions asked (N = 13, 100%). The responses of the chatbots in many cases differed in the amount of content generated. Chatbot Gemini repeatedly generated extensive explanations with a scattering of additional information. In contrast, Perplexity generated the shortest responses. Two questions showed differences in responses, such as: When do you feel the first movements of the fetus? answers were obtained:

Perplexity – between 16 and 22 weeks of pregnancy, Gemini between 16 and 24 weeks of pregnancy, ChatGPT 3.5 – between 18 and 25 weeks of pregnancy. Most questions showed no significant differences. All chatbots received high averages in the evaluation by medical specialists. Medical specialists evaluating the correctness of the chatbots' answers did not give a rating of "1 – strongly disagree" and "2 – rather disagree" in any case. Responses generated by Gemini more often than not received the highest average ratings (7 out of 13), ChatGPT responses 3.5 were rated better than the other chatbots in 6 of 13 questions and Perplexity in only 2 of 13 answers. Gemini and ChatGPT's 3.5 responses in two questions received the same high average score.

**Conclusions:** All three language models can be a potentially useful source of information about pregnancy. AI can be an additional source of pregnancy information that both patients and healthcare professionals should use with caution. However, it is important to remember that chatbots are not a substitute for consultation with a qualified medical professional.

Keywords: artificial intelligence, chatbot, pregnancy

## Hypertension as a civilization disease – prevention and education

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**Introduction:** Arterial hypertension is a condition in which the blood pressure in the blood vessels is increased and is 140/90 mm Hg or more. Arterial hypertension is a disease of civilization, and the number of patients increases significantly every year. In Poland, there are 10 million adults suffering from hypertension. This disease can lead to serious health consequences, including such as heart disease or stroke.

**Objective:** The work will discuss hypertension as a lifestyle disease. The work pays particular attention to the causes, prevention and education of this disease.

**Material and methods:** Analysis of scientific articles and books on hypertension.

**Results:** Arterial hypertension can be divided into essential and secondary. Risk factors for hypertension include obesity, inappropriate diet, lack of physical activity, stress, smoking and heredity. Diagnosis is based

on regular measurement of blood pressure, and treatment includes lifestyle changes, including a low-sodium diet, regular physical activity, medications to lower blood pressure, and avoidance of risk factors. People with hypertension should check their blood pressure regularly as recommended by their doctor. Preventive and educational activities based on a healthy lifestyle can help prevent hypertension and reduce the risk of health complications related to this disease.

Conclusions: Improving public awareness and promoting a healthy lifestyle are key to reducing the incidence of hypertension. This will contribute to improving public health and reducing the burden on primary health care.

Keywords: arterial hypertension, lifestyle disease, prevention, education

## Diagnosis of carpal tunnel syndrome – where are we now?

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Introduction: Carpal tunnel syndrome is one of the most common peripheral neuropathies of the upper limb, occurring when the nerve is compressed as it passes through the wrist canal. Proper diagnosis is key to selecting the appropriate therapy, and due to the multitude of conditions mimicking carpal tunnel syndrome, diagnosis poses challenges to practitioners. Objective: This work aims to introduce modern diagnostic methods and compare them with older ones.

Material and methods: A review and analysis of scientific papers from 2000 to 2024 were conducted in scientific databases such as Web of Science, Scopus, Wiley, PubMed, and Cochrane, based on MeSH terms: carpal tunnel syndrome, diagnosis, ultrasound, clinical tests.

Results: No clinical test provides one hundred percent certainty, there is no universal diagnostic mode, diagnosis using modern diagnostic methods is gaining value, especially ultrasound.

Conclusions: Objectification of examinations using modern diagnostic methods allows for a more accurate diagnosis.

Keywords: carpal tunnel, diagnostics, ultrasound, clinical tests

## The impact of artificially induced disorders in the stomatognathic system on postural stability and foot loading distribution

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Introduction: The aim of this study was to investigate whether artificially induced occlusal imbalance could affect foot loading distribution in static conditions and selected stabilographic parameters in individuals without symptoms of temporomandibular joint disorder. A secondary objective was to promote an interdisciplinary approach to treating patients with postural disorders.

Material and methods: The study involved 30 healthy young individuals – 17 females (26 ± 5.1 years) and 13 males (26 ± 4.9 years). Temporomandibular joint assessment was performed using the subjective indicator – the Occlusal Gsellmann Index. The study comprised three trials (I – with the mandible in a neutral position, II – with the mandible shifted to the left, and III – to the right), during which changes in occlusal conditions were induced by placing a cotton roll between the dental arches and shifting the mandible. Selected stabilographic parameters and foot pressure distribution [%] and distribution of foot pressure forces on the support surface [g/cm<sup>2</sup>] in static conditions were evaluated using the FreeMed platform.

Results: Mandible position change significantly influenced the foot loading distribution of the participants ( $p < 0.05$ ). Significant differences were also noted in the mean values of the maximum pressure of the left foot between the trial with the mandible shifted to the left and to the right ( $p = 0.032$ ), and in the maximum pressure of the right foot between the trial with neutral positioning and the trial with the mandible shifted to the right ( $p = 0.021$ ). Stabilographic examination showed significant differences in the mean lengths of sways between the trial with neutral mandible positioning and the trial with the mandible shifted to the left ( $p = 0.029$ ). Conclusions: Proper occlusion is a significant factor influencing the maintenance of functional balance of the whole body. These preliminary results underscore the need to consider the craniofacial area in the diagnosis and treatment of orthopedic patients.

A multidisciplinary approach involving dentists and physiotherapy specialists, with the development of common diagnostic protocols and the use of tools for comprehensive posture assessment, is necessary.

Keywords: occlusion, postural stability, foot load distribution

## Sexual abuse of minors in the family environment based on research in Poland – a review of the literature

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The aim of the article is to review the Polish literature on the phenomenon of incest, understood as one of the forms of sexual exploitation of minors, carried out

in the family environment. The results of empirical studies cited in the article clearly indicate that the experience of sexual abuse, especially that experienced in the family, has an extremely devastating effect on the child's development, physical well-being and mental health, and may also result in the emergence of inadequate and risky coping mechanisms. The paper focuses exclusively on Polish authors, and most of the studies are from the first and second decades of the 21st century. The review includes 47 publications, most of which are original scholarly articles, research papers and reviews, as well as excerpts from books and information from websites. The method of comparative analysis was adopted, focusing on the issue of the scale of the procedure discussed in Poland, the multifaceted terminology and definitions, the characteristics of families in which child sexual abuse occurs, the impact of incest on persons experiencing such trauma, the typology of perpetrators and the problems associated with diagnosing a child in a situation of suspected sexual abuse in the family.

Keywords: sexual abuse, incest, family, child, minor