



BOOK OF ABSTRACTS



The 7th European Specialist Nurses Organisations (ESNO) Congress “Green Future, Health Workplace: Nurse Specialist Leading the Way!” was held in Zagreb, Croatia, bringing together advanced practice and specialist nurses from across Europe. The event focused on strengthening the role of specialist nurses in modern healthcare systems and promoting interprofessional collaboration, with special accent on nurses contribution to green and sustainable policies in healthcare. Through keynote speeches, panel discussions, and interactive workshops, participants explored key topics such as education, leadership, and patient-centered care. The congress also provided a valuable platform for networking and sharing best practices among European nursing professionals. On behalf of the Editorial board we would like to thank to our lecturers, participants and sponsors for making this event great success.

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Dear Esteemed Colleagues and Distinguished Guests,

It is with great pleasure that we present the Book of Abstracts for the 7th European Specialist Nurses Organisation (ESNO) Congress, themed "Green Future, Healthy Workplace: Nurse Specialists Leading the Way!", held 29 - 31 May 2025 in Hotel International, Zagreb, Croatia.

This congress serves as a pivotal platform for advancing innovation, education, and recognition within our profession, with a dedicated focus on fostering healthier environments for our patients, communities, and ourselves. We are honored to feature an exceptional lineup of faculty speakers whose expertise and dedication continue to inspire and guide us:

- Wendy Budin, PhD, RN-BC, FAAN
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Their contributions are invaluable to the success of this congress, and we extend our deepest gratitude for their participation.

7th ESNO Congress would not be possible without our Co – organizers, University of Applied Health Sciences Zagreb, University of Bjelovar, Faculty of Medicine Pula, Croatian Nursing Society of Anesthesia, Reanimation, Intensive Care and Transfusion (CNSARICT), and Croatian National Nurses Federation (CNNF), Faculty of Health Studies University of Rijeka, Sigma Theta Tau International – Alpha Alpha Gamma Chapter Croatia, University of Zadar, Federazione Nazionale Ordini Professioni Infermieristiche.

Special thanks to Congress Scientific Board and ESNO Policy Officers for their diligent efforts in shaping the program and ensuring the congress addresses the most pertinent topics in our field.

This collection of abstracts encapsulates the collective knowledge and innovative spirit of nurse specialists dedicated to leading the way toward a sustainable and healthy future. We hope it serves as a valuable resource and inspiration for all attendees. Furthermore, we also wish to express our sincere appreciation to our sponsors, whose generous support has made this event possible. Their commitment to advancing nursing excellence is truly commendable.

Sincerely,
dr. Adriano Friganovic, PhD, FESNO, FFNMRC SI
European Specialist Nurses Organisation
President

DISSEMINATING EVIDENCE FROM RESEARCH, INNOVATIONS & PRACTICE-GLOBAL PERSPECTIVES

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Background: Dissemination of practice innovations & research output through global publication is important for nursing as it publicizes and raises the profile of important activity, shares important activity & findings with the relevant community, permits open dialogue and debate about activities, enables the research to have impact (measured by citation or altimetric), serves to raise the profile of the organization & profession and acts an important factor in university rankings and promotion systems.

Aims/Objectives: This presentation aims to explore publication outputs from Croatia in the field of nursing. It further aims to explore the broad contribution from Croatia within nursing Journals and identify patterns & trends in relation to dissemination of nursing science and practice from Croatia.

Design: A Scopus search was conducted in February 2025 to determine the extent of publications from Croatia in the field of nursing (in general) and specifically in the following Journals:

- International Journal of Nursing Studies
- Journal of Advanced Nursing
- Nurse Education Today
- Nurse Education in Practice
- Nursing Ethics
- Journal of Clinical Nursing

Findings: Overall, there has been a slow but steady increase year by year in publications categorised as *nursing* from Croatia since 2000, especially over the last 5 years. Most published papers were categorised as research. This is a very positive finding given the importance of research and scholarly output in relation to the professional development of nursing as an academic discipline. European Commission funding emerges a strong support for nursing research activity & dissemination. It is interesting to note that although categorised as *nursing*, the most common *source titles* found in this study did not feature the high-ranking nursing journals. A closer examination of the trends also revealed that the top five authors [those who published most frequently] in the category of 'nursing' did not appear to be affiliated to nursing schools or a nursing professor.

Conclusion: Croatia, like the rest of the world, is facing unprecedented demographic, workforce and technological challenges for the future. The consistently changing nature of healthcare requires a skilled workforce who can provide evidence-based practice. Nurses are required to understand and use research, and fundamentally nursing scholars ought to be leading and driving research and evidence-based practice in the field. Nursing scholars need to continue with dissemination and lead in driving nursing research, albeit in a multidisciplinary context. Given the volume of research available and the environmental constraints researchers ought to be strategic in relation to their research priorities. Large

outcome focused projects ought to be prioritized, and dissemination efforts maximized to ensure that these become a robust reflection of the art and science of nursing in Croatia.

PATIENT SAFETY IN SLOVAK CHILDREN'S TEACHING HOSPITALS

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Background and Rationale: WHO has established World Patient Safety Day on 17 September 2019, recognizing patient safety as a global health priority. Due to Integrated Approaches to Patient Care, the Ministry of Health of the Slovak Republic in 2019 issued a decree on the minimum requirements for an internal patient safety assessment system.

Objectives and Methods: Compliance with this decree in 3 Children's Teaching Hospitals in Slovakia - in Bratislava, Banská Bystrica, Košice - was evaluated by analyzing the internal directives of hospitals and interviewing nursing hospital directors. The area of patient safety in inpatient health care was assessed: Safe identification of patients; safety in the use of medicines and their storage; prevention of confusion of the patient, medical procedure and the patient's side or body part in surgical procedures; optimal hand hygiene procedures in the provision of health care; safe hand over of patients; prevention of decubitus ulcers in hospitalized patients; management of emergencies; preventive and control precautions against nosocomial infections; elimination and prevention of falls; sustainability of patients' mobility; safe communication; compliance with patients' and persons' rights; monitoring of patients' satisfaction.

Results or Expected Outcomes: All hospitals comply with the Ministry of Health decree, but in different ways.

Conclusion and Implications: Patient safety is ensured in all Slovak Children's Teaching Hospitals.

Key Words: Patient Safety, Hospital, Nursing.

PROFESSIONAL RESPECT AS EXPERIENCED BY PUBLIC HEALTH NURSES IN FINLAND

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Background: Patient care suffers when nurses are not respected. Therefore, to improve patient outcomes, it is crucial that nurses practice in moral environments of intrinsic and social worth that foster respect for their dignity. Theoretical underpinnings for this study were derived from Darwall's recognition and appraisal respect concepts¹.

Aim: To describe nurses' experience of professional respect in community practice in Finland to expand understanding of professional respect internationally.

Design/Method: Data were collected using a descriptive qualitative method with purposive sampling of public health nurses working in districts in the Kuopio area in Finland. Twenty-six nurses were interviewed in small interview groups. Data was coded with inductive content analysis, extracting meaning units from interview transcripts. Eighteen categories and three related themes were abstracted.

Results: Public health nurses' self-respect was the first theme. Other themes were linked to patients' trust in public health nurses and respect for public health nurses in different health and social networks.

Conclusion: Public health nurses contended that if they were not respecting their profession, they did not have the right to expect others to do it. Participants were proud of their profession because it was the oldest nursing education speciality in Finland. Besides, nurses valued self-respect for their profession through their attitude to have lifelong learning, to update their competencies and to develop the capacities for public health nurses' work. Furthermore, the patients' trust had a key role in nurses' experiences of respect. The patients' trust was displayed through meaningful interactions where nurses were valued for their expertise by the public. Lastly, nursing's professional respect was stressed through meaningful interactions with colleagues and other professionals.

References:

1. Darwall S. Two kinds of respect. *Ethics* 1977; 88: 36-49.

Key Words: Professional respect, dignity, public health nurses

THE DEVELOPMENT OF A NEW MODERN TOOL TO ASSESS NURSING COMPETENCY IN MALTA

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This presentation will outline the journey that Mr Axiak has undertaken up to now as part of his Ph.D. study, whereby he is now aiming to develop a new, modern tool to assess nursing competency in Malta (and also in Europe). The journey started 4 years ago and he has gone through various stages, challenges and changes until he arrived where he is today.

Possessing the required competencies is very important within today's nursing culture as these form the basis of safe, evidence-based and patient-centred care. The presentation will outline the various stages taken by the author, his findings up to date and how these led him to change his aim from developing a set of tools for various specialities to developing a completely new generic tool. This decision was based on modern principles presented by the World Health Organisation, European Union and United Nations, that were merged with principles identified by Maltese nurses of various levels working in different areas of nursing.

Finally, the presentation will outline how he intends to check the tool for reliability and validity, where and how he intends to use it within the Maltese context and, maybe later, even in a wider European one.

Background and Rationale: Possessing the required competencies is very important within today's nursing culture as these form the basis of safe, evidence-based and patient-centred care. However, on searching the literature, one finds that although there are a number of tools available to assess nursing competency, most are quite comprehensive but have been developed years ago. In the meantime nursing and healthcare has evolved and the important issues have changed. At the same time the European Union, World Health Organisation and United Nations have all presented guidelines and reports that are worth noting and addressing. The development of this new tool seeks to address those requirements and recommendations, to be implemented in Malta (where no official competency assessment is carried out) and maybe even in other European Countries.

Objectives and Methods:

1. To identify the competencies which are important for nurses working in Maltese institutions.
2. To develop a tool to assess nursing competencies in Maltese healthcare institutions.
3. To check the tool for validity and reliability.

Results or Expected Outcomes:

The expected outcome is a new modern valid and reliable tool to assess nursing competency in Malta (and Europe).

Conclusion and Implications: The implications of this study would be the monitoring of nursing standards of care in Malta and hence it will act as an eye opener for nurses, nursing management and healthcare institutions as to which competencies and areas of care will need further improvement.

Key Words: Nursing, competency, competence, Europe, care

THE NURSING THEORY OF COMPLEX ADAPTIVE SYSTEMS: A NEW PARADIGM FOR NURSING

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Background

The article explores the theoretical and practical implications of applying the Nursing Theory of Complex Adaptive Systems (CAS) within the context of nursing practice. Grounded in the principles of CAS, this theory introduces a new paradigm for nursing that aims to address the dynamic and evolving nature of healthcare. The Nursing Theory of Complex Adaptive Systems emphasizes a holistic and interactive approach to care, focusing on the adaptability of care plans to meet patients' changing needs.

Methods

The article delves into the foundational principles of Complex Adaptive Systems and their application to nursing theory. It reviews the relevant literature and theoretical frameworks to establish the basis for the Nursing Theory of Complex Adaptive Systems. The discussion includes the role of interprofessional collaboration and communication in enhancing care quality and the potential for this theory to reshape nursing practice, education, and research.

Results

The Nursing Theory of Complex Adaptive Systems offers a robust framework for developing adaptive and resilient nursing practices. It highlights the importance of personalized care plans that can evolve with patients' needs and underscores the necessity of interprofessional collaboration and effective communication in improving patient outcomes. The theory fosters a more flexible, interdependent, and holistic approach to patient care, which is essential in navigating the complexities of modern healthcare.

Conclusions

The Nursing Theory of Complex Adaptive Systems has significant implications for nursing practice, education, and research. By integrating the principles of CAS into nursing, this theory promotes a paradigm shift toward a more adaptable and holistic approach to healthcare. Future research should focus on the empirical validation of this theory and its practical implementation across various healthcare settings to enhance patient outcomes and improve healthcare systems.

Key Words: Complex adaptive systems, nursing theory, nursing, holistics, adaptation, resilience, flexibility

IMPLEMENTATION AND EXPANSION OF A GREEN ICU PROGRAM: A CASE STUDY IN A HIGH COMPLEXITY HOSPITAL IN LATIN AMERICA

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Clínica Las Condes

Environmental factors contribute to a significant portion of global mortality, with healthcare systems accounting for approximately 4.4% of global greenhouse gas emissions. Hospitals, as major resource consumers, produce substantial waste, creating an urgent need for sustainability initiatives. Intensive Care Units (ICUs) disproportionately impact the ecological footprint due to their resource-intensive nature. This study examines the implementation of a GreenICU program, expanding into a GreenHospital initiative, at a high-complexity hospital in Chile, a middle-income Latin American country.

Objective: This research aims to describe and analyze strategies, barriers, facilitators, and outcomes of implementing a recycling program within the hospital, emphasizing waste management.

Methodology: A descriptive, retrospective, exploratory study was conducted, focusing on program implementation from 2019 to 2023. Data sources included program documentation, waste records, and direct observations. Quantitative data on waste trends were complemented by qualitative analysis of operational challenges and strategies.

Results: The program began in the ICU and expanded to maternity, emergency, and food service areas. Over five years, recycled waste included 36.4% paper and cardboard, 1.9% plastic, and 59.1% organic waste. Challenges included space constraints, staff resistance, and logistical limitations, addressed through targeted training and cross-departmental collaboration. Recycling peaked in 2021 (102,579 kg) , with subsequent declines indicating a need for sustained engagement.

Discussion: The study highlights the feasibility of sustainability programs in resource-limited settings. The ICU's leadership role facilitated hospital-wide change. Key enablers included institutional commitment, clear protocols, and interdepartmental collaboration. However, gaps in waste data and declining participation underscore the need for continuous education and policy support.

Conclusions: GreenICU programs can significantly reduce hospital waste and inspire broader sustainability initiatives. The findings provide a scalable model for other healthcare institutions in Latin America, emphasizing the role of ICUs in environmental stewardship and aligning healthcare practices with global sustainability goals

Key Words: Medical Waste Disposal; Waste Management; Recycling; Environmental Health; Green Team

JOB DEMANDS, RESOURCES, AND NURSE RETENTION IN ITALY WHAT DRIVES TURNOVER

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Background and Rationale: Understanding, measuring, and addressing nurses' turnover intentions are essential to retaining the workforce and ensuring healthcare system sustainability. In Italy, the nursing profession faces significant challenges, with nurse-to-population ratios and graduation rates below the European average. The COVID-19 pandemic further exacerbated turnover rates, highlighting the urgency of addressing this issue. Despite its critical impact, research on nursing turnover in Italy remains limited. Identifying the key factors influencing nurse turnover is fundamental to developing effective retention strategies.

Objectives and Methods: Aim: To examine job demand/resources as determinants of nurses' intention to leave their job.

Methods: This cross-sectional study utilized structural equation modeling (SEM) to examine turnover determinants based on the Job Demands-Resources (JD-R) and Social Exchange Theory (SET). An online survey was conducted in 2022–2023 among nurses working across various healthcare settings in Italy.

Results or Expected Outcomes: Results: A total of 1745 nurses participated. Findings indicated that high job demands—including physical, mental, and emotional workloads— were significantly associated with increased turnover intentions. Conversely, job resources such as decision-making autonomy, supportive leadership, and positive leader-member relationships linked to improved retention. Younger nurses demonstrated a higher likelihood of considering leaving their jobs.

Conclusion and Implications: Early identification of nurses at risk of leaving and understanding turnover drivers are crucial for workforce sustainability. Strengthening job resources and fostering supportive work environments are key strategies to enhance nurse well-being, job satisfaction, and retention. Implementing targeted retention policies and best practices is vital to improving healthcare workforce resilience.

Key Words: nurses; turnover; retention; SEM; workload; job demands; job resources; autonomy; LMX

EMBEDDING ENVIRONMENTAL SUSTAINABILITY INTO VETERINARY NURSE EDUCATION

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The impact of healthcare on the environment is increasingly recognised as a global concern, with healthcare professionals playing a pivotal role in driving sustainable practices. In response to this, the Royal College of Veterinary Surgeons (RCVS) has introduced a new regulatory requirement within its Accreditation Standards for veterinary nursing education and training. Educational institutions seeking accreditation must now demonstrate a reasonable commitment to environmental sustainability, including consideration of the environmental impact of programme delivery.

This presentation will explore the rationale behind introducing this requirement, the expectations placed on educational institutions, and the intended long-term impact on the veterinary nursing profession. By embedding sustainability principles into education, the aim is to foster a generation of Registered Veterinary Nurses (RVNs) equipped with the knowledge and motivation to promote and implement sustainable practices within veterinary settings. This regulatory change is expected to catalyse a cultural shift, where sustainability becomes a core professional value in veterinary practice.

Attendees will gain insight into how regulatory bodies can influence sustainable practices in healthcare education and the potential for broader positive environmental impact through future generations of healthcare professionals.

Key Words: environmental sustainability, education, training

CODE RED FOR HUMANITY: CLIMATE CHANGE AS THE DEFINING PUBLIC HEALTH EMERGENCY

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Climate change is no longer a distant or theoretical concern—it is an unfolding, undeniable global health crisis. A vast body of scientific evidence confirms that rising global temperatures, extreme weather events, worsening air and water quality, biodiversity loss, and ecosystem disruptions are profoundly affecting human health. The World Health Organization (WHO) has identified climate change as one of the most significant public health threats of the 21st century, with consequences that are accelerating at an alarming rate.

This plenary lecture will present the latest scientific data on the health impacts of climate change, including the rising burden of vector-borne diseases, respiratory illnesses from air pollution and wildfires, heat-related mortality, and the surge in climate-induced mental health disorders. Food and water insecurity are exacerbating malnutrition and infectious diseases, while climate-driven displacement is triggering complex humanitarian and geopolitical crises. Healthcare systems, already stretched to capacity, are now facing infrastructure vulnerabilities, supply chain disruptions, and increasing patient loads due to climate-related morbidity.

Beyond outlining these challenges, this session will highlight actionable solutions and sustainable healthcare practices that can help mitigate the impact of climate change on public health. A key focus will be the promotion of low-carbon, nature-based interventions, including the innovative practice of Shinrin-yoku forest therapy—a science-backed approach to preventing chronic diseases such as hypertension and cardiovascular disorders with minimal ecological footprint. Throughout the congress, participants will have the opportunity to experience this evidence-based intervention firsthand, showcasing how planetary health strategies can be seamlessly integrated into clinical and community health settings.

The time for passive observation has passed. Healthcare professionals—nurses, physicians, policymakers, and public health experts—must unite in urgent, transformative action. This plenary lecture will serve as a call to mobilize the healthcare community in confronting climate change, not only as a threat but as a catalyst for sustainable, innovative, and preventive health solutions.

QUALITY OF NURSING WORKING LIFE, WORK ABILITY INDEX AND INTENTION TO LEAVE THE WORKPLACE AND PROFESSION

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Nurses are facing a number of challenges, such as the aging population, the associated increased need for medical interventions, the complexity of nursing care, the shortening of patients' length of stay in hospital, stress in the workplace and staff shortages. To ensure safe and high-quality care, it is therefore necessary to pay attention to the quality of nursing working life (QNWL) and the work ability index (WAI), which can influence the intention to leave the workplace and the profession.

The aim of the study was to determine the level of QNWL, the Work Ability Index (WAI) and the intention to change jobs and leave the profession. A cross-sectional study was conducted in 2023, in which 498 respondents took part. Demographic data was collected and the Brooks Nurses' Quality of Work Life Questionnaire and the Work Ability Index Questionnaire were used. Respondents answered questions about their intentions to change jobs and leave the profession in the last 12 months.

The majority of respondents (73.7%) had a moderate QNWL and a good (43.8%) and excellent WAI (22.5%). Male respondents, respondents who did not have children, and respondents who did not care for their parents had higher WAI scores. A statistically significant positive correlation was found between QNWL and WAI. The majority of respondents (61.1%) had thought about changing jobs in the last 12 months, and 36.9% of respondents had thought about leaving the nursing profession. No statistically significant correlation was found between QNWL, WAI and intention to change jobs and leave the profession.

By improving nurses' QNWL and taking care of WAI, a healthcare facility influences the overall productivity, commitment, work efficiency, nurses' health and job satisfaction. A high QNWL is important to retain and attract nurses. Employers and nurse managers should take measures aimed at ensuring a high QNWL and excellent WAI and monitoring and influencing the reasons that cause nurses to leave the workplace.

Keywords: quality of work life, work ability index, leaving the profession, nurses

WELL-BEING AND INTEGRATION OF MIGRANT NURSES THE CASE OF ALBANIAN NURSES

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Background and Rationale: International migration of nurses from low- and middle-income countries to high-income nations is a growing global phenomenon (1). Currently, one in eight nurses is employed in a country different from where they were born or trained (2). Albania, a middle-income country in Western Balkans, has experienced a 200% increase in nurse migration requests in recent years, with Germany emerging as a key destination (3). Limited research exists on the integration experiences of Albanian nurses in host countries.

Objectives and Methods: Aim: To explore the integration experiences of Albanian nurses within the German institutions.

Methods: A descriptive quantitative observational study was conducted using a snowball sampling technique. An online survey was distributed in 2024 to Albanian nurses employed in Germany.

Results or Expected Outcomes: A total of 162 nurses participated. Findings indicated a positive integration experience, particularly regarding the recognition of professional qualifications, respect from colleagues, patients, and families, career opportunities, and workplace autonomy. Host institutions facilitated integration through mentorship programs, language training, procedural education, and orientation on the German healthcare system. However, participants reported challenges related to medical terminology, telephone communication, and healthcare documentation. Many emphasized the need for more structured pre-departure preparation to ease their transition.

Conclusion and Implications: This study highlights the essential role of host institutions and healthcare managers in promoting inclusive work environments and supporting migrant nurse integration. Germany serves as a model for effective integration strategies. Albania must strengthen retention efforts for their nurses. Future research should focus on identifying pre-departure needs and developing standardized assessment tools to evaluate integration outcomes.

Key Words: nurses, human migration, work integration, Albania nurses, nursing workforce, ethics in mobility

FEASIBILITY OF A NATURE-BASED INTERVENTION ON HEALTHCARE PROFESSIONALS A GREEN APPROACH TO SUPPORTING HEALTHCARE PROFESSIONALS

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Background and Rationale: Nature-based interventions (NBIs) have gained increasing attention for their positive impact on physical, mental, and social well-being. These interventions include a range of structured activities conducted in natural environments, such as forest bathing, therapeutic horticulture, gardening, ecotherapy, and nature prescriptions, all of which aim to enhance health outcomes and overall quality of life.

Studies suggest that exposure to natural environments contributes to stress reduction, improved cardiovascular function, enhanced immune response, and increased social cohesion, making NBIs a promising non-pharmacological strategy for disease prevention and management.

Given these well-documented benefits, NBIs may be particularly valuable for healthcare professionals, a population frequently exposed to chronic occupational stress and burnout due to the demanding nature of their work. Healthcare workers, especially those in high-pressure environments such as hospitals, experience long shifts, high patient loads, and emotionally distressing situations, leading to mental exhaustion, reduced job satisfaction, and increased risk of medical errors.

Despite their potential, NBIs are understudied in healthcare settings. Given their accessibility, cost-effectiveness, and adaptability to workplace environments, nature-based interventions may represent a practical and innovative approach to mitigating work-related stress among healthcare professionals.

Objectives and Methods: This pilot study aims to assess the feasibility of a nature exposure intervention conducted on healthcare workers, evaluating its impact on stress and the subject's mood profile.

This monocentric, non-pharmacological pilot study enrolled 20 healthcare workers from the rehabilitation facility in Northern Italy. Participants were randomly selected and provided informed consent. The intervention in this study was a 30-minute walk in the garden of the rehabilitation center. The walk was performed individually by each subject, without communication with other people. The use of smartphones or other electronic devices that could be distracting or stressful was not allowed during the intervention. Each subject completed the walk in the middle of their working day, after about 4 hours of work, before their lunch break.

Medical information was collected through interviews and medical records, including age, gender, medical history (e.g., musculoskeletal, neurological, cardiovascular diseases), current therapies, and past conditions.

Measurements occurred at baseline (T0) and post-intervention (T1). The heart rate, oxygen saturation, and blood pressure were recorded after 10 minutes of rest at both time points. To assess serum cortisol levels, a 5 ml blood sample was taken before and after the 30-minute walk.

Mood state was assessed through a 10-item mood survey adapted from the Profile of Mood States (POMS) scale. Responses ranged from 0 (not at all) to 4 (extremely), evaluating emotions such as tense, anger, worn out, unhappy, lively, confused, sorry for things done, shaky, listless, and peeved.

Data were analyzed in aggregate form. Quantitative data were reported as median and interquartile range (IQR), while categorical variables were presented as frequencies and percentages. Statistical significance was assessed using the Wilcoxon test, with a p-value < 0.05 considered significant. Analyses were performed using IBM SPSS® Version 25 for Windows.

Results or Expected Outcomes:

20 healthcare professionals were enrolled in the study, including 4 physicians, 5 nurses, 9 physiotherapists, and 2 speech-language therapists. The majority were women (85%), with a median age of 42 years and a range of 25-63. Medical conditions and treatments showed that 20% (4 participants) had musculoskeletal conditions, 1 participant had an autoimmune disease, while none had neurological, neoplastic, or cardiovascular conditions; 45% (9 participants) were under pharmacological treatment, including contraceptives, antihypertensives, vitamins, thyroid medication, and statins; 90% (18 participants) were non-smokers, while the only two smokers were female. Median serum cortisol decreased by 1.68 µg/dL, and physiological parameters (heart rate, oxygen saturation, blood pressure) remained stable before and after the intervention. Mood analysis revealed a significant improvement in tension ($p = 0.001$), worn out ($p = 0.014$), and anger ($p < 0.001$). The proportion of participants reporting no tension increased from 30% to 70%, no stress from 15% to 55%, and no anger from 70% to 95%. The pre- and post-median values for levels of unhappiness, confusion, self-discontent, trembling, listlessness, irritation, and the feeling “full of life” were in line.

Conclusion and Implications:

This study highlighted how brief exposure to green spaces could serve as a potential strategy for stress prevention and its related issues. These initial findings suggested the importance of exploring more extensive interventions aimed at reducing stress and associated conditions, even within workplace settings like the one examined. If confirmed in larger studies, nature-based interventions could offer a cost-effective, non-pharmacological strategy to mitigate occupational stress, promote workplace well-being, and prevent burnout, particularly in high-stress healthcare settings.

Key Words: Nature-based intervention, healthcare professionals, well-being, green spaces, stress reduction, burnout prevention

IMPORTANCE OF PROFESSIONAL ASSOCIATIONS IN NURSING THE ROLE OF SIGMA THETA TAU INTERNATIONAL

Boris Ilić, Snježana Čukljek

University of Applied Health Sciences

Professional associations in nursing play a crucial role in advancing the profession, enhancing education, and strengthening nursing science. These organizations provide nurses with access to continuous professional development, scientific research, and global networking aimed at improving healthcare. One of the most prominent international organizations dedicated to nursing excellence is the Sigma Theta Tau International Honor Society of Nursing (Sigma).

Sigma brings together leading experts in nursing, fostering research, scientific exchange, and innovation in practice. Through its programs, it provides access to international scientific databases, mentorship, participation in global conferences, and leadership development. Membership in Sigma offers nurses opportunities for professional growth, networking with colleagues worldwide, and contributing to the shaping of healthcare policies and standards of care.

The impact of professional associations in nursing is evident in the strengthening of individual competencies, the advancement of nursing practice, and the overall improvement of healthcare quality on a global scale. Organizations such as Sigma create an environment that promotes excellence, innovation, and interdisciplinary collaboration, further contributing to the development of the nursing profession.

Key Words: Professional Associations, Nursing Societies, Leadership, Career Development, International Collaboration

THE ROLE OF PROFESSIONAL DIGNITY IN END-OF-LIFE NURSING CARE: A QUALITATIVE EXPLORATION PERCEPTIONS OF PROFESSIONAL NURSING DIGNITY IN PALLIATIVE AND HOSPICE CARE SETTINGS

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Nursing professional dignity represents a fundamental dimension of occupational well-being and quality of care. It consists of an intrinsic dimension, related to the value of the person, and a contingent dimension, influenced by social and professional contexts. Exploring professional dignity in community settings is essential to understanding the dynamics that influence its recognition.

The aim of the study is to analyze nurses' perceptions of their professional dignity in the palliative care context.

A qualitative study was conducted based on 12 focus groups with 69 nurses working in hospice and home care in two Italian regions. The data collected and transcribed were analyzed through an inductive coding process, which produced 612 codes, 49 subcategories and 17 main categories, summarized into five themes.

Themes that emerged included: the inherent dignity of the individual, nursing professionalism, intra- and interprofessional relationships, ethical dilemmas, and relationships with patients and their families.

Nurses reported greater perceptions of respect for their professional dignity in palliative care than in other previous studies conducted in hospital settings, an accomplishment related to good intra- and interprofessional relationships and good relationships with patients and their families. Professional dignity was more respected in homecare than in hospice. In such settings, nursing professionalism was emphasized even though the emotional burden on nurses was high because of the ethical dilemmas they faced.

Key Words: professional dignity, quality of care, palliative care, nurse well-being, nursing ethics

HOW EFFECTIVE IS THE SPECIALIST CLINIC ROLE IN THE MANAGEMENT OF EXTERNAL VENTRICULAR DRAIN?

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Background and Rationale:The clinical nurse specialist in External Ventricular Drains (EVD), possesses the expertise to ensure correct management of the shunt itself. However, despite the identification of these skills, the infectious risk related to this device, is still high (0-22%).

Objectives and Methods:The aim of this systematic review was to investigate on how the clinical role of the specialist nurse led to a reduction in the infectious risk associated to EVD. A systematic review was undertaken following the PRISMA guidelines. The review was conducted from 2014 January 1st to 2024 December 31st. The studies that were included in this review were only Primary Studies. The research was conducted using four different databases: PubMed, Cinahl, Scopus and Web of Science. The articles were then methodologically evaluated using the checklists provided by the JBI.

Results: Among the 653 articles identified first, 6 records were ultimately included in this review. There's no evidence of a Gold-Standard for the correct management of the EVD, except for the use of Chlorhexidine for skin preparation.

Conclusion: The absence of a Gold-Standard for the correct management of the EVD, and the observation of a decrease in the infectious risk reported, show how the specialist clinic's knowledges strongly impact on the risk itself. However, specialist nurses and research nurses, are encouraged to carry out further studies to guarantee a standardization of the management about this neurosurgical device.

Key Words: External Ventricular Drain; Specialist Clinic Role; Hospital; Infection control

ENVIRONMENTAL SUSTAINABILITY IN HEALTHCARE TRANSFORMING CRITICAL CARE UNITS FOR ENVIRONMENTAL CONSERVATION

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Clínica Las Condes

The environmental impact of healthcare, particularly in critical care settings, is a growing concern in the context of climate change. This narrative review synthesizes the current evidence regarding environmental sustainability in Intensive Care Units (ICUs) and proposes implementable mitigation strategies. ICUs generate significant environmental effects, with each patient/day accounting for approximately 17 kg of waste and 12 kg of CO₂. Our analysis revealed three key areas of impact: resource consumption, waste generation, and carbon emissions, with energy and gas usage contributing up to 87% of the total emissions in critical care settings. Although ICUs face unique challenges, their operational characteristics, including high resource utilization, dedicated staff ratios, and structured processes, make them ideal settings for implementing and evaluating sustainability initiatives. The review identifies promising strategies, including life cycle assessment, the 5R framework (Refuse, reduce, reuse, recycle, and repair), and multidisciplinary environmental teams. Success requires balancing patient safety with environmental responsibility, while standardizing carbon footprint measurements across different healthcare contexts. This review provides a comprehensive framework for environmental impact reduction in critical care, emphasizing the need for increased research attention in middle- and low-income countries, and the systematic implementation of evidence-based environmental strategies.

Key Words: critical care, environmental sustainability

GAMIFICATION AS A STRATEGY TO IMPROVE QUALITY OF LIFE AND SOCIALIZATION IN OLDER PEOPLE: A LITERATURE REVIEW

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In recent years, gamification has emerged as an innovative strategy in the geriatric field, aiming to enhance the cognitive, physical-motor, and psychosocial abilities of older adults. The use of serious games and digital games has proven to be a promising approach to fostering social inclusion, reducing isolation, and improving overall well-being in individuals over the age of 65.

This literature review aims to analyze the impact of gamification in enhancing quality of life and social engagement through interactive digital tools. The research was conducted in November 2024 using the PubMed and CINAHL databases, selecting primary studies published in the last five years and following the PRISMA 2020 guidelines.

The findings indicate that the use of serious games and digital games among older adults contributes to improved quality of life by promoting psychological and physical well-being, as well as increased personal satisfaction through engaging and enjoyable experiences. Social interaction is significantly enhanced, reducing feelings of isolation and encouraging active participation. Additionally, the results highlight positive effects on mood and emotional well-being, leading to increased motivation and self-esteem. Another key aspect is the role of gamification in promoting digital literacy, fostering familiarity with new technologies, and making social activities more accessible, stimulating, and rewarding.

This review confirms that gamification represents a valuable opportunity to improve the quality of life of older adults, making social activities more engaging and supporting active and participatory aging. Its application in geriatric and rehabilitative settings deserves further exploration to optimize its effectiveness and facilitate its integration into care and assistance programs.

Key Words: elderly, gamification, quality of life, wellness, socializing

BLOOM FROM WOMB: A PHENOMENOLOGICAL STUDY ON STUNTING PREVENTION ACTIONS IN A PROVINCE OF INDONESIA

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The pregnancy period is an essential period for both mother and fetus as the basis for their health condition and risk of in the future, including childhood stunting, is influenced by the first 1000 days of life. There are limited studies on the efforts to prevent childhood stunting during pregnancy. This research aims to explore the experiences of pregnant women in preventing childhood stunting during pregnancy. Qualitative research with a phenomenological approach was used. One-on-one interviews were conducted on 20 pregnant women (13-40 gestational weeks) from seven regencies of Bangka Belitung Islands province were selected by purposive sampling. They were asked about their experiences of maintaining health to prevent stunting during pregnancy. The interview process was recorded and transcribed from August-October 2023. The data was analyzed using thematic analysis. Four main themes emerged, including: (1) Stunting prevention behavior (antenatal care, nutritious food and vitamin); (2) Risky pregnancy experiences (adolescent marriage, no vitamin consumption); (3) Health service support (pregnancy book guideline, medical check-up), and (4) Social support (family support, health cadres' support). Various efforts have been made to prevent childhood stunting, and the support felt by pregnant women was explored in this research, including those with high-risk conditions. The assistance program for high-risk pregnant women and innovation in observation methods with a technological approach will support monitoring during pregnancy and is expected to reduce the prevalence of high-risk in mothers and fetuses. This research strengthens the data regarding the implementation of government programs related to the stunting reduction, and serves as a basis for developing follow-up programs that significantly achieve the targets looking to improve maternal and fetal health.

Key words: Children Health, Malnutrition, Pregnant Women Empowerment

EXPLORING AND MAPPING THE LIVED EXPERIENCES OF STIGMA AMONG PEOPLE LIVING WITH A MENTAL ILLNESS: A SCOPING REVIEW

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Stigma affects a large proportion of people with mental health conditions and it can be a potent social stressor, presenting persistent challenges to individuals' coping abilities. The present study aimed at mapping and exploring the direct experiences of stigma encountered by individuals with mental health conditions. A scoping review was conducted according to Joanna Briggs Institute guidelines. Searches of PubMed, PsycINFO, EmBASE, and CINAHL led to 18 eligible qualitative studies. Four primary themes emerged: self-stigma, involving the internalization of societal stereotypes; descriptions of social and public stigma; lack of knowledge in mental illnesses' course; and the consequences of stigma for individuals' lives. Results highlight the deeply negative and exclusionary impact of stigma surrounding mental disorders, outlining its manifestation and repercussions for social life. Future research is needed to identify a direct approach to the issue and to detect the most appropriate approaches in facing it. To help limiting the experience of stigma, healthcare providers should ensure an individualized care relationship, in a secure and empathetic environment filled with elements of understanding, consent and informativeness.

Key Words: mental disorders, mental health, nursing, stigma

FAMILY AND COMMUNITY NURSING IN ITALY – THEORETICAL MODEL AND ETHICAL CHALLENGES

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Background: Family and community nursing in Italy has evolved significantly over the years, reflecting changes in healthcare policy, societal needs, and the emphasis on preventive care. Historically, nursing in Italy was primarily focused on hospital care, but there has been a growing recognition of the importance of community health and family-centered approaches.

Objectives: To build a family and community nursing model that can be applied to improve the Italian National Health System for families.

Methods: An investigation to identify and determine the use of organizational models for family and community nursing throughout Italy was conducted. Mixed method research was accomplished via a parallel concurrent design (Creswell, Plano Clark 2011). A web survey was conducted through the National Federation of OPI Boards for Nurses website to obtain quantitative data. Relevant stakeholders (n=140) from different backgrounds (GPs, nurses, nurse managers, and service users) participated in semi-structured interviews to obtain qualitative data.

Results: Although various organizational models have been used to foster continuity of care among the different regions of Italy, a critical problem was the lack of a transparent, sustainable and ethically defined family and community nursing model that could be implemented throughout Italy. The role of the community and family nursing was not well delineated. Furthermore, an ethical dilemma emerged as a lack of formal recognition of nurses in the role of family/community nurses, including no existing working contractual agreements.

Discussion: The characteristics, meanings, and challenges the Italian NHS is experiencing in efforts to introduce family and community nursing and guarantee coordination of care for patients in chronic conditions are urgent priorities in Italy. A theoretical model for family and community nursing was produced as part of this research study. The model centers provide primary care services through district agencies, specifically home care or health homes, managed by nurses. The model also makes salient the ethical implications of improving the Italian National Health System

Key Words: Family, community, nursing

CLUSTERING SELF-EFFICACY IN NUTRITIONAL CARE AMONG ITALIAN NURSES: A SINGLE-CENTER PILOT STUDY

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Background and Rationale:

The growing worldwide population of elderly individuals, particularly susceptible to nutritional deficiencies, underscores the necessity for effective, patient-centred nutritional care. Nurses play a pivotal role in ensuring high-quality nutritional care through their involvement in screening, assessment, planning, and monitoring. Inadequate self-efficacy limits nurses' potential in this area. However, no studies have explored nurses' self-efficacy behaviours in the nutritional care of the elderly through a clustering approach.

Objectives and Methods:

This pilot study investigated clustering solutions based on nurses' self-efficacy in nutritional care and key demographic factors. Data were cross-sectionally collected from 77 nurses working in two tertiary hospitals in northern Italy, following a power analysis employing a Monte Carlo simulation with a hypothesized difference among self-efficacy scores between clusters of at least Cohen's $d = 1.0$. Self-efficacy was assessed using the validated Self-Efficacy Scale for Nursing Nutritional Care alongside demographic and professional variables. Clusters were identified utilizing hierarchical clustering following t-distributed Stochastic Neighbor Embedding (t-SNE) information reduction, and the solution was validated using Multiple Correspondence Analysis.

Results or Expected Outcomes:

Two clusters with adequate silhouette widths were identified. Cluster 1, labelled "Experienced Nurses with Low to Moderate Self-Efficacy," included older nurses with a mean age of 47.43 years and more work experience (mean total work experience of 23.43 years) but lower self-efficacy scores. Cluster 2, labelled "Younger and Confident Nurses," comprised younger nurses with a mean age of 30.87 years and less work experience (mean total work experience of 7.13 years) but higher self-efficacy scores.

Conclusion and Implications:

This study provides novel insights into subgroup differences in self-efficacy among nurses, identifying two distinct clusters. The results highlight the feasibility of clustering approaches for examining self-efficacy in nutritional care, providing critical groundwork for hypothesis generation and informing future research. Further, this study emphasizes the need for targeted interventions tailored to specific professional profiles.

Key Words: Care; Evaluation Research; Evidence-based Practice; Health; Health promotion; Nurse - Patient interaction; Nurse roles; Nutrition; Older People

EXPLORING GENDER DIFFERENCES IN PATIENT ENGAGEMENT: A SCOPING REVIEW

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Introduction: Patient-centered healthcare emphasizes patient engagement as a critical factor in improving outcomes. Despite gender's impact on healthcare, gender-specific dimensions of engagement remain insufficiently investigated.

Objective: To explore, map, and synthesize gender differences in patient engagement, providing an in-depth analysis of the most effective tools for enhancing engagement.

Methods: A scoping review was conducted following JBI guidelines and the PRISMA-ScR checklist. The databases consulted were MEDLINE, CINAHL, PsycINFO, Embase, and Scopus. Two independent authors conducted the selection process blindly.

Results: Five studies were included. They explored engagement tools across gender differences, highlighting effective strategies. Mobile health interventions with structured tasks and therapist support enhanced engagement among women by fostering accountability. Gamified interventions promoting participation through competition and social interaction improve engagement in men. Peer-led, gender-affirming programs tailored to transgender women improved engagement by addressing stigma and identity needs. Text messaging interventions maintained high engagement across genders, demonstrating long-term behavior change.

Conclusions: Engagement levels vary between genders and are influenced by education and age range. Determining the most effective engagement tool is challenging, as each included study measured engagement using different outcomes and did not use validated scales that would allow for comparisons between the different tools.

Key Words: Engagement, Gender, Gender identity, Involvement, Patient activation, Patient engagement, Patient participation

ANALYSIS OF HOUSEHOLD WASTE DISCARDED BY HEALTH INSTITUTIONS IN CHILE: A DESCRIPTIVE STUDY

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Clínica Las Condes

Introduction: Approximately 60% of waste considered as household waste discarded by health institutions is recyclable. In Chile, there is no detailed analysis of the quantity of waste directed to landfills. This descriptive study aims to understand the national reality of household waste discarded and reported by health institutions, evaluating how many of them report on the recycling of this waste.

Objective: To assess the national situation of household waste discarded by health institutions in Chile, evaluating how many reports on the recycling of this waste.

Methodology: Open data from the Ministry of Environment for the years 2018 to 2022, published by the National Waste Generation Service (SINADER), was reviewed, filtering the analysis for health institutions. Any waste declared for recycling or pre-treatment, without subsequent elimination, was considered as valorization.

Results: 162 health establishments reported their waste (3.6% of those existing in Chile), totaling 291,324.57 tons in the analyzed period. Of these centers, 42 reported performing some type of recycling, with the maximum valorized by a health institution being 13.6%. 38% of these centers are public institutions, and 54% belong to regions outside the Metropolitan Region.

Discussion: There is a significant gap in the declaration of household waste, making it important to understand the local reality of each center to know what strategies they use to minimize eliminated waste. Chile manages to sustainably manage about 2% of its waste, while countries like the Italia made 34%. To reach international standards, this number must be increased at least 5 times.

Conclusions: Considering the recycling potential of up to 60%, this study reveals for the first time the recycling gap in Chilean health institutions. The need for greater coordination between units and with the center's management is crucial for the success of the recycling program and to close this gap, thus promoting sustainable practices in the health sector.

Key Words: Medical Waste Disposal; Waste Management; Recycling; Environmental Health; Chile

LEADERSHIP TRANSFORMATION AND NURSING DYNAMICS

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Background: Transformational leadership fosters trusting relationships, new visions, and personal, professional, and cultural growth. Effective leaders support their team's motivational growth and organizational goals. This study highlights the importance of transformational leadership and its dimensions, particularly in healthcare organizations.

Method: A cross-sectional design with convenience sampling was used. Evaluation tools included the Multifactor Leadership Questionnaire (MLQ-6S), the Satisfaction of Employees in Health Care (SEHC) questionnaire, and the Personal Mastery Scale (PMS).

Results: The study found significant correlations between leadership styles, job satisfaction, and personal mastery, regardless of the workplace environment or leadership style. The laissez-faire leadership style was the only one showing no correlation with nurses' job satisfaction. Other leadership styles showed significant positive or negative correlations with the analyzed variables.

Conclusions: Transformational leaders are essential for fostering trust, innovation, and engagement in healthcare settings. Positive leadership styles enhance job satisfaction and professional commitment, reducing staff burnout. Conversely, laissez-faire and autocratic leadership styles can negatively impact performance and staff satisfaction. These findings highlight the critical role of leaders in creating positive work environments and supporting employee development and well-being in healthcare.

Key Words: Transformational leadership, healthcare organizations, job satisfaction, personal mastery, leadership styles, employee engagement

INTERVENTIONS FOR MANAGING NURSING MORAL DISTRESS: A SCOPING REVIEW

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Introduction: Moral Distress is a painful feeling and/or psychological imbalance that occurs when nurses are aware of the most appropriate moral action in each situation but are unable to carry it out for various reasons. The phenomenon of Moral Distress in nursing practice is sometimes unknown and often underestimated.

Material and Methods: A Scoping Review was conducted to identify interventions useful for preserving the emotional integrity of professionals in operational settings. The research project was carried out between June 2020 and February 2024 by consulting major biomedical databases—CINAHL, Embase, PubMed, and Scopus—to identify published research articles.

Results: Among the fourteen analyzed studies, seven were qualitative studies, two were qualitative Grounded Theory studies, two were Randomized Controlled Trials, one was a case report, one was a pilot study, and one used a mixed-methods approach. Several thematic areas emerged as predominant in the evaluated studies.

Conclusions: The intervention that was found to be beneficial across all studies analyzed in this Scoping Review was seeking support from fellow nurses, breaking the silence that keeps professionals experiencing Moral Distress isolated in their suffering. This study highlights the need to promote research on the effectiveness of interventions or proactive actions to counteract Moral Distress.

Key Words: Moral distress, nurses, scoping review

POSTOPERATIVE PAIN IN ADULT PATIENTS AFTER OPEN CARDIAC SURGERY

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Introduction

Open heart surgery involves a surgical procedure that solves the problem of blocked heart blood vessels or valve diseases. During this, an incision is made in front thoracic region, which, in addition to the benefits it brings, causes damage to tissue and bone structures. As a result, intense pain occurs and if we do not have adequate treatment, it affects the patient's mobility, interferes with daily activities and affects the patient's recovery and quality of life.

Aim: The aim was to explore postoperative pain in adult patients after open cardiac surgery.

Methods: This quantitative study was conducted at a hospital in northeastern Bosnia and Herzegovina and included patients aged 18 to 65 undergoing elective cardiac surgery. Pain was assessed on the first, third, and seventh postoperative days using two scales: the Behavioral Pain Scale (nurse-assessed) and the Numerical Rating Scale (patient-reported). Statistical analyses included descriptive statistics, the Chi-square test, Wilcoxon's test for paired data, and Cohen's Kappa to evaluate pain prevalence, scale agreement, and influencing factors.

Results: The first result indicated that the pain prevalence in patients after cardiac surgery was under 25% on the first day. No statistical significance differences between patients' demographic data and pain. There is a decreasing trend in a assessment of pain in different timepoints.

Conclusion: The preliminary results of this study indicate that, following weight-adjusted pain management, a significant number of patients experience pain relief. However, further efforts are needed to individualize pain treatment and to assess pain using validated instruments that healthcare professionals are trained to utilize effectively

Key Words: Pain, acute postoperative pain, pain after cardiac surgery

THE TEACH-BACK METHOD TO ENHANCE ENGAGEMENT WITH DIGITAL TECHNOLOGY IN HYPERTENSION MANAGEMENT

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Introduction. Hypertension is the leading preventable risk factor for cardiovascular disease. Mobile health (mHealth) offers a promising, cost-effective approach to improving blood pressure management while enhancing patient engagement. No studies to date have specifically examined how combining a teach-back-based educational approach with the use of mHealth in managing hypertension. This study aimed to assess the effectiveness of a teach-back-based educational approach in fostering patient engagement with mHealth.

Materials and Methods. A longitudinal study was conducted in three phases. The study involved 76 patients. In the first phase (T0), patients received training about the use of two wearable technology devices through the teach-back method. Afterward, participants completed the TWente Engagement with E-health Technologies Scale (TWEETS) to measure engagement. Patient engagement was reassessed at 6 (T1) and 12 weeks (T2) after the educational training. A repeated-measures ANOVA was performed to compare the mean scores across the three phases.

Results. The statistical analysis revealed no significant change in the TWEETS score between T0 and T1 ($p=0.42$). However, the score significantly decreased at T2 compared to the previous two time points ($p<0.002$).

Conclusions. Our results suggest that the teach-back method is effective for maintaining patient engagement in the short to medium term. However, its impact appears to decrease over time. Further research is needed to explore whether combining teach-back with additional strategies, such as gamification, telemedicine, remote monitoring, or peer support, can help maintain long-term patient engagement with digital technologies.

Key Words: Engagement, digital technology, teach-back, hypertension

THE IMPACT OF PROBIOTICS ON DISEASE RELAPSES AND REMISSION RATES IN ADULTS WITH INFLAMMATORY BOWEL DISEASE

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Background and rationale:

Inflammatory bowel disease, including Crohn's disease and ulcerative colitis, is a chronic condition that significantly impacts quality of life. Despite advances in pharmacological treatment, disease relapses are recurrent and alternative strategies for symptom control are required. Probiotic features are known to induce gut health through microbial-immune system crosstalk. However, evidence of their efficacy in achieving and maintaining remission in IBD remains inconsistent. This study summarizes the current state of knowledge on the effects of probiotics on IBD relapse rates, maintenance of remission in adults.

Method:

This systematic review applies a structured search strategy in databases PubMed, Scopus, Web of Science and CINAHL and follows PRISMA guidelines. The study adheres to the PICO framework, with the population defined as adults diagnosed with IBD. The intervention includes all strains of probiotics, either as sole therapy or in combination with standard treatments, compared to placebo or standard treatment. Primary outcomes include relapse incidence, remission rates, disease burden and quality of life measures. Eligible randomized controlled trials (RCTs) published in the last ten years will be systematically screened and analyzed.

Objective:

This review aims to provide a comprehensive synthesis of the efficacy of probiotics in reducing IBD relapses and maintaining remission in adults.

Expected results:

Preliminary results suggest that the efficacy of probiotics varies by strain, treatment duration and patient subgroups.

Conclusion and implications:

The results of this study will contribute to evidence-based recommendations for the integration of probiotics into IBD management. By clarifying their role in disease modulation, this research supports the development of patient-centered, non-invasive therapeutic strategies aimed at improving clinical outcomes and quality of life in adults with IBD.

Key Words: Inflammatory bowel disease, probiotics, relapse prevention, remission maintenance, gut microbiota

HOSPITAL ENVIRONMENTAL HYGIENE: A QUANTITATIVE STUDY FROM CROATIA

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Healthcare-associated infections are a major cause of patient morbidity and mortality worldwide. While some of these infections are easily treatable, others can have a more serious impact on patients' health, prolonging their hospital stay, increasing treatment costs and causing discomfort to patients.

Environmental hygiene in healthcare has been the subject of research for many years as an important measure to prevent infections. However, during the Covid pandemic it gained increased attention and became the subject of research worldwide. Today, hand hygiene and environmental hygiene in healthcare are certainly two preventive measures that can contribute significantly to the prevention of healthcare-associated infections if work protocols are implemented and staff are trained in their correct implementation. The hygiene of the hospital environment and its impact on the transmission of microorganisms that can cause healthcare-associated infections and directly affect patient safety are still insufficiently researched.

In the period from April to November 2024, a quantitative study was conducted in Croatian hospitals in accordance with ethics committee approvals. Out of a total of 35 participating institutions, consent was obtained from 29 and the questionnaire was completed by 27. The self-assessment questionnaire on environmental hygiene in healthcare was used, which was translated from English into Croatian language.

The aim of the study was to assess the level of environmental hygiene in healthcare facilities based on the self-assessment of healthcare personnel working in infection prevention and control departments.

The data was analyzed using descriptive statistics and the preliminary results will be presented. The preliminary results of the study are ununiform levels of environmental hygiene, working procedures, equipment and education of persons involved in cleaning processes.

Key words: Infection prevention, health care, facilities, environment

AUDITORY HALLUCINATIONS SIMULATION IN MENTAL HEALTH NURSING EDUCATION: A SCOPING REVIEW

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Mental health education is crucial to address the daily challenges related to this specific type of patient. Generally, nursing students acquire knowledge about auditory hallucinations through classroom lectures before engaging in clinical practice; however, their understanding of the potential experiences of patients remains limited. Simulation is considered a valid approach to replicating authentic scenarios within a safe environment, especially in the context of mental health, where hallucinations can lead to aggressive behavior, violence, suicide, and self-harm.

Objectives and **Methods:**
This study aims to identify the state of the art of nursing simulation for patients with mental health problems presenting auditory hallucinations. Specifically, it aims to identify outcomes studied in the literature, existing tools used to simulate auditory hallucinations, the effectiveness of such methodology and tools, and learners' experience and satisfaction. A Scoping Review was performed following the Arksey & O'Malley framework and integrating relevant aspects of the Johanna Briggs Institute methodology for Scoping Review. The Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) was followed for reporting. Quality appraisal and meaningful quotes meta-synthesis were also performed.

Results:

In 10 of the 13 included studies, nursing students wore headphones that played audio imitating auditory hallucinations and then assigned to complete specific activities. Retrieved evidence suggests the effectiveness of the methodology and high student satisfaction. However, in a small number of cases the impact of the simulation was so emotionally strong that overwhelmed some learners, causing physical discomfort, slight anxiety and sleep disturbances.

Conclusions:

Nursing educators are called upon to carefully choose these simulation tools, focusing specifically on their content regarding voice characteristics and the potential students' vulnerabilities.

Key Words: Auditory Hallucinations, Hallucination simulation, nursing education, mental health, advanced education

OBSTACLES, OPPORTUNITIES AND NEEDS FOR LEARNING DISASTER NURSING IN BACHELOR'S NURSING PROGRAM IN INDONESIA: A QUALITATIVE STUDY

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Indonesia is a country that is prone to disasters, so the curriculum and learning methods for disaster nursing are a necessity. Nursing higher education has the responsibility to prepare students to be able to help themselves, victims and their environment in disaster conditions. This needs to be prepared in learning disaster nursing courses. The aim of this research is to identify problems, potential, opportunities, challenges and needs related to disaster nursing learning in undergraduate nursing study programs.

Patients and methods: The qualitative research method used is content analysis to look for needs, obstacles and hopes that nurses can master in disaster conditions. Respondents in this study were volunteer nurses, policy makers in disaster conditions. Results: Qualitative research results for obstacles to disaster nursing learning obtained themes of diverse curriculum and learning methods (disaster volunteers, stakeholders, lecturers), pandemic conditions, changes in learning and reduced satisfaction, and a lot of learning material (students). For the potential and opportunities theme, this study showed themes of various and frequent disaster events in Indonesia, the synergy of disaster management associations and agencies in learning, and student activity units as a means of adjusting the standardized disaster nursing curriculum (volunteers, stakeholders, lecturers) and developing learning methods (students).

Conclusion: These findings reflect the need for disaster learning in undergraduate nursing study programs in developing nurse competencies. It is important to have standardization of the disaster nursing curriculum, learning media that easily accessible to all nursing higher education institutions in Indonesia, and standardized disaster nursing training for lecturers in charge of critical nursing learning, so that nursing student competencies can be standardized throughout Indonesia.

NURSES' BELIEFS AND THE UTILIZATION OF NURSING DIAGNOSES: A CROSS-SECTIONAL STUDY

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Introduction: Nursing Diagnosis (NDs) form the basis for a nurse's choice of interventions to achieve specific goals and objectives, reflecting the complete autonomy and responsibility of the nursing profession.

Objective: This study explored nurses' belief patterns regarding NDs and examined how these patterns related to socio-demographic factors, clinical reasoning skills, and work environment characteristics. Additionally, the study aimed to identify key factors influencing the long-term use of NDs in clinical practice.

Methods: A cross-sectional study was conducted with 444 nurses from two Italian hospitals. Data were collected using the Behavioral Beliefs Scale (BBS), Normative Beliefs Scale (NBS), Control Beliefs Scale (CBS), Positions on Nursing Diagnosis (PND), Intention Scale (INT), Behavior Scale (BHS), Practice Environment Scale of the Nursing Work Index (PES-NWI), and Nurse Clinical Reasoning Scale (NCRS). Cluster analysis was performed to identify belief patterns, and zero-inflated negative binomial regression (ZINB) was used to assess predictors of NDs utilization over time.

Results: Three distinct belief clusters emerged: positive beliefs (37.4%), neutral beliefs (48.6%), and negative beliefs (14%). Nurses in the positive belief cluster demonstrated stronger clinical reasoning skills and a more favorable perception of their work environment. Significant differences were observed across clusters in practice environment subscales and behavioral beliefs. Nurses with positive beliefs exhibited greater intention (OR = 2.18, 95% CI: 1.41–3.37, $p < 0.001$) and self-efficacy (OR = 1.79, 95% CI: 1.21–2.64, $p = 0.004$) in using NDs. However, work environment and clinical reasoning levels did not directly influence ND utilization.

Conclusions: Classifying nurses based on their beliefs about nursing diagnoses (NDs) and identifying determinants of NDs utilization allows administrators and educators to design targeted interventions that enhance the integration of nursing diagnoses into clinical practice.

Key Words: nursing diagnosis, clinical reasoning, work environment, nursing documentation

ADAPTING THE FUNDAMENTALS OF CARE FRAMEWORK TO IMPROVE NURSING CARE IN CLOISTERED COMMUNITIES INTEGRATING PHYSICAL, PSYCHOLOGICAL, AND SPIRITUAL NEEDS IN NURSING CARE FOR CLOISTERED COMMUNITIES

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The "Fundamentals of Care Framework (FoC) " defines essential nursing care as activities that place the patient at the center of care, ensuring respect and attention to their needs. The health of elderly individuals, nuns in our case, in closed communities, requires an approach that integrates physical and spiritual needs. In these settings, the Family and Community Nurse has to address complex necessities related to frailty and chronic comorbidities, while respecting spiritual traditions and existing physical barriers. The aim of the study is to analyze the nursing care of a community of cloistered nuns in Italy, using the FoC Framework.

A qualitative study using semi-structured interviews was utilized. The interviews with the 8 cloistered nuns were content analysed to identify categories and themes. Two main themes are emerging. 1) Frailty and chronic conditions: Initial observations suggest that integrating the FoC Framework may contribute to a more structured approach to addressing both physical and spiritual well-being among the nuns. 2) Perception of care: The nuns have preliminarily reported a sense of increased support and safety, along with a growing awareness of the importance of fundamentals of care in their daily lives. The use of the FoC Framework in closed community settings, such as monasteries, appears promising in enhancing care quality by adapting global principles to specific local needs. Preliminary observations suggest that this approach could offer tangible benefits for the nuns, highlighting the importance of integrating international standards with local adaptations to innovate nursing care and address the physical, psychological, and spiritual dimensions of health.

Key Words: Fundamental of Care Framework, Nursing Care, Cloistered Communities, Family and Community Nurse, Chronic Conditions, Qualitative Study, Holistic Care.

EMBRACING VULNERABLE MIGRANTS BY EMPOWERING THEIR SELF-CARE

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Introduction: Migration represents a global phenomenon that affects millions of people around the world and has significant implications for their health and well-being. Specifically, Vulnerable Migrants, including irregular migrants, refugees, and asylum seekers, face unique challenges such as migration traumas, language barriers, social difficulties, limited access to healthcare, and family problems. These challenges might lead to a decrease in health status in host countries. Self-care in VM has never been studied, but could be an important factor contributing to VM well-being and health.

Aim. The objective of this study will be threefold: 1) to describe self-care in VM in the dimensions of self-care maintenance, monitoring, and management; 2) to identify Problem-, Person- and Environmental-related variables predictors of self-care behaviors in VM; 3) to identify the impact of self-care in VM on quality of life, the access to health care and health providers and the onset of chronic diseases.

Methods: A longitudinal international study will be conducted on a convenience sample of 1000 adult VM. To be eligible for the study, VM must be aged ≥ 18 years, be first-generation migrants, and have been living in the hosting country for at least one month. VM with major mental or terminal diseases will be excluded.

Expected results. This study will provide the scientific community and clinicians with the first data on self-care in VM, including its predictors and outcomes. Our results will be useful to shed light on the phenomenon of self-care in VMs and to design future interventions to improve self-care and health outcomes.

Key Words: vulnerable migrants, self-care, health.

HEALTH PROFESSIONAL LABOUR MOBILITY IN THE GLOBAL ARENA: CODES OF ETHICS FOR RECRUITMENT

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Background

Health worker migration has been increasing worldwide, even though flows decreased significantly during the COVID-19 pandemic. In the new normal, the WHO's Global Code of Practice demonstrates that the challenges to respecting acceptable labour practices of health professionals have yet to be attained in many countries.

Aim

An examination of different ethical codes for health professionals' recruitment has been accomplished.

Methods

The research group analyzed different ethical codes created explicitly for health professional recruitment. The salient sentences regarding the ethics of fair recruitment were grouped inductively and further scrutinized to highlight the main themes.

Results

Crucial advice for health leaders were clustered in three main themes: a) A solid commitment to supporting the individual rights of health personnel to the highest attainable standard to mitigate the adverse effects and maximize the positive effects of migration b) Data improvement in health professional labour migration and, c) Multi-stakeholder policy dialogues to foster international discussion on fair ethical recruitment of health personnel.

Discussion

Nurse leaders could take measures to alleviate the burden of countries with chronic shortages of health professionals and mitigate the effects of the adverse events of migration towards more affluent countries. First, it is central that policies to maximize benefits for migrant nurses should be respected by all parties. Second, destination countries have to collaborate with source countries to sustain and promote healthy human resource development and training as appropriate. Third, more research based on interlinked datasets is pivotal to effectively monitoring health actors' flows.

Key Words: Codes of Ethics, nurses, mobility, migration

THE POST-OPERATIVE HANDOVER THROUGH THE ISOBAR METHOD: A PRELIMINARY STUDY

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Background:

It is well-established in the literature that surgical patients are more vulnerable to handover process errors than patients in other clinical specialties. The handover between the operating room and the hospital ward is one of the most critical stages where omissions and unclear communications may occur, leading to an increased risk of errors during the postoperative course. Despite these concerns, various studies report that postoperative handover is often informal, incomplete, and unstructured.

Objectives and Methods:

This study aimed to assess nursing staff's perception regarding implementing the ISOBAR handover methodology in the postoperative setting. Therefore, a monocentric pre-post study was conducted in a Northern Italy hospital surgical ward to assess nurses' perceptions before (T0) and after (T1) implementing the ISOBAR methodology for postoperative handover. Data collection was carried out by administering the same specially developed questionnaire to the nursing staff.

Results:

A total of 85 questionnaires were collected: 24 at T0 and 61 at T1, completed by 24 nurses. The reliability analyses using Cronbach's Alpha and McDonald's Omega for the questionnaire yielded globally positive values both at T0 ($\alpha = 0.938$, $\Omega = 0.947$) and T1 ($\alpha = 0.895$, $\Omega = 0.901$).

At the Wilcoxon matched-pairs signed-rank test, the difference for each item on the questionnaire from PRE to POST was statistically significant ($p < .001$), highlighting a clear improvement in the perception of the quality of the information provided, patient safety, effectiveness, and efficiency of the handover process, reduction in information omissions during handover, and overall staff satisfaction.

Conclusions:

This study provides preliminary evidence supporting the introduction of the ISOBAR methodology for postoperative handovers. Further quantitative studies using robust methodology are needed to clarify the impact of the ISOBAR methodology on measurable outcome indicators (e.g., completeness of information, adverse events, and average length of stay).

Key Words: Handoff, Handover, Safety, Omissions, ISOBAR, Information, Communication

THE ROLE OF COMPASSION IN ADDRESSING NURSING CARE COMPLEXITY

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The ability to cope with the complexities of care requires cross-cutting skills that can respond to both clinical and relational needs. Compassion, understood as an active response to the suffering of others, is a key resource for promoting the humanization of care while improving the psychological well-being of health professionals.

The aim of this study was to explore the compassionate practice of nurses, analyzing its benefits in terms of quality of care and professional resilience in different care settings.

A single-center descriptive observational study was conducted using a valid and reliable measurement instrument. The Compassion Scale, validated in Italian, was administered to 120 nurses working in Intensive Care Units, Emergency Rooms and Oncology Departments. The dimensions of compassion investigated included mindfulness, kindness, humanity and non-indifference.

The response rate was 85% (102 questionnaires). All dimensions of compassion reported mean values above the cut-off value (≥ 3), indicating widespread compassionate practice. The highest scores were found in Oncology, with a low incidence of compassion fatigue (1%) in Emergency Rooms. Professional experience and female gender emerged as facilitating factors for compassion itself.

Compassion as a core care concept has proven to be an effective response to governing the complexity of health care needs. Implementing training paths aimed at enhancing this competency is a key strategy to contribute to the quality of assistance and emotional sustainability of practitioners.

Key Words: Compassion, Quality of Care, Patient centred-care, Nurse well-being, Professional Resilience

SOURCES OF NOISE AND THEIR IMPACT ON NURSES IN INTENSIVE CARE UNITS

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Modern working environments demand appropriate working conditions. During work hours, workers are exposed to various strains and stressors. Noise in the workplace is one of the primary and most common stressors, resulting in numerous health challenges, including physiological and psychological effects on well-being. Hospitals are environments where individuals may experience high levels of noise. Both patients and healthcare professionals can be exposed to high noise levels and discomfort. Exposure to unsafe noise levels can affect patient well-being and healthcare professionals' productivity.

Objective

The research aims to identify noise sources and related adverse effects from the perspective of nurses in intensive care units, examine differences in noise perception within and outside the ICU based on demographic and job-related variables, investigate differences in subjective, emotional, physiological perceptions, and work performance according to demographic and job-related variables, and explore the association of noise within and outside the ICU with subjective, emotional, physiological perceptions, and work performance.

Methods

The study sample included 100 nurses employed in intensive care units (ICU) across several institutions (Clinical Hospital Merkur, General Hospital "Dr. Josip Benčević" Slavonski Brod, General Hospital Pula). Data was collected using a three-part questionnaire. The first part focused on personal-professional characteristics. The second part assessed internal and external noise sources from the nurses' perspective. The third part evaluated the impact of noise on four domains: physiological, emotional, subjective perception, and work performance. Data were statistically analyzed using descriptive statistical methods.

Results or Expected Outcomes: The Kolmogorov-Smirnov test was used to assess the impact of noise within and outside the ICU on subjective, emotional, and physiological perceptions and work performance, and it showed significance ($P < 0.05$). Results indicated significant differences in noise perception within the ICU according to the type of employment institution (Mann-Whitney test; $P = 0.006$) and location of employment (Mann-Whitney test; $P = 0.006$). There was also a significant difference according to the number of beds (Kruskal-Wallis test; $P = 0.017$), with a notably higher impact of noise on participants working morning shifts and in rotating shifts compared to those working only in shifts ($P = 0.006$). Results across the four domains (subjective perception, emotions, physiological, and work performance) showed significant relationships with the bed occupancy rate, type of ICU, and number of beds ($P < 0.05$). Moreover, the performance domain results had a significant relationship with work experience, bed occupancy rate, and type of shift ($P < 0.05$).

Conclusion and Implications: As noise is a health hazard and disrupts both patients and ICU staff, it is recommended that appropriate strategies should be devised to reduce its impact.

Key Words: noise, intensive care unit, nurses, healthcare facility, patient

FINGERPRINT CHANGE AFTER ANTICANCER TREATMENTS: A SYSTEMATIC INTEGRATIVE REVIEW

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Biometric verification involving fingerprinting has been spreading worldwide in several social and healthcare contexts. Along with the widespread use of fingerprints, more cases of 'loss' of fingerprints have been registered. Several dermatological or non-dermatological causes have been investigated, however, little is known about fingerprint changes as a result of anticancer treatments. We assessed the strength of evidence between cancer therapy and fingerprint change in adult patients with cancer. A systematic integrative review was conducted following the Cochrane guidelines for conducting a systematic review. PubMed, CINAHL, Web of Science, and Scopus were searched from the inception between August and November 2024. The NOS scale and JBI Checklist were employed to assess the methodological quality of the cohort studies and case reports, respectively. Of 176 records, we included five experimental studies articles and nine case reports. A documented correlation exists between specific anticancer treatments (capecitabine, taxanes, and tyrosine kinase inhibitors) and changes in fingerprints among individuals with various cancer diagnoses, particularly advanced breast and colorectal cancers. The majority of articles exhibited moderate to low quality. While there is documentation of fingerprint alteration resulting from certain anticancer treatments, additional extensive and rigorously designed experimental studies are necessary to accurately assess the extent of this phenomenon in connection with particular anticancer regimens and populations. A call to action on the psychosocial and forensic implications of anticancer therapies is necessary to enhance cancer care pathways and ensure the social integration of cancer patients. Social and forensic implications of symptom burden should be a global priority to guarantee equitable access to facilities among cancer patients.

Key Words: Adermatoglyphia; Cancer; Change; Chemotherapy; Fingerprint; Loss

A SYSTEMATIC REVIEW OF NURSING COMPETENCIES: ADDRESSING THE CHALLENGES OF EVOLVING HEALTHCARE SYSTEMS AND DEMOGRAPHIC CHANGES

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Background: The role of nurses is poised to undergo significant transformations in the forthcoming years due to rapidly evolving sociocultural, environmental, and technological phenomena. Defining and assessing nursing competencies are crucial for ensuring quality nursing care and fostering professional growth. This literature review aimed to explore future nursing competencies and the sociocultural phenomena shaping them. **Methods:** A systematic search was conducted in PubMed, CINAHL, Scopus and Web of Science databases using keywords such as “nursing competencies,” “future,” “healthcare systems,” and “demographic change.” Studies published within the last 5 years were included and underwent rigorous quality assessment.

Results: The findings indicate that phenomena such as environmental sustainability, technology, innovation, globalization, urbanization, uncertain policies, and demographic evolution will significantly impact nursing competency development. Projections suggest that nearly 70% of the nursing workforce will operate in areas marked by high uncertainty and unpredictability. The review underscores the importance of cultivating interpersonal, higher-order cognitive, and system-level competencies, along with complementary skills in personal and customer services, decision-making, technology, creativity, and the scientific method. **Conclusions:** Addressing future challenges in nursing requires a holistic and strategic approach. This entails a cultural shift within the profession, supported by targeted policies and investments in training and continuous professional development. Education and training systems must prioritize the development of “structural” competencies and lifelong learning capacities.

Key Words: nursing competencies, future, healthcare systems, demographic change, sociocultural phenomena

THE HEALING POWER OF NATURE: THE IMPACT OF NATURAL VIEWS AND GREEN SPACES ON PATIENT RECOVERY IN HOSPITAL ENVIRONMENTS

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Integrating natural elements into hospital environments has garnered significant attention due to their potential therapeutic benefits. Seminal research by Ulrich (1984) demonstrated that postoperative patients with views of natural landscapes experienced shorter hospital stays and required fewer analgesics than those with brick walls.

This paper investigates the impact of natural elements in the hospital environment on patient recovery and well-being. By analyzing relevant research, it seeks to determine how visual contact with nature, indoor green spaces, and biophilic design influence stress reduction, cognitive function improvement, and rehabilitation acceleration. A comprehensive literature review focused on studies examining the effects of natural views and green spaces on patient recovery in hospital settings. Databases such as PubMed, ScienceDirect, and JSTOR were searched using keywords including "nature views," "hospital recovery," "green spaces," and "patient outcomes."

The literature consistently indicates that exposure to natural environments positively impacts patient recovery. For instance, a study by Tennessen and Cimprich (1995) found that students with dormitory rooms overlooking natural settings performed better on attention tests than those with views of urban environments. Similarly, research by Park et al. (2009) revealed that postoperative patients in hospital rooms with forest views experienced lower stress levels and required fewer pain medications than those without such views. Furthermore, exposure to nature has been associated with physiological benefits, including reduced blood pressure, lower heart rate, and enhanced immune function. These physiological changes may contribute to faster recovery times and improved patient outcomes.

Key Words: Natural Elements, Hospital Environment, Patient Recovery, Green Spaces, Healing Architecture

CLIMATE CHANGE AND HEALTH RISKS THE ROLE OF THE NURSE IN PROMOTING CONSCIOUSNESS AND BEHAVIORAL CHANGES: A PILOT STUDY

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Climate change is an increasing threat to public health, with major impacts on respiratory, cardiovascular and infectious diseases, as well as mental health consequences.

Scientific evidence supports that public awareness of environmental risks as well as mitigation and adaptation strategies are still limited.

Nurses can contribute with other healthcare professionals to raise awareness and disseminate knowledge about the connection between climate change and health in order to promote wellness-oriented behaviors. In response to this challenge, an awareness-raising trial based on a Planetary Health approach was conducted at the World Nurses' Day organized by O.P.I. in Turin.

The scope of the project is to promote public awareness and encourage behaviors to mitigate health risks associated with climate change. The initiative, designed for people of all age groups, takes place in a public area and involves four healthcare professionals. It follows a structured course of action lasting approximately 30 minutes, consisting of educational, interactive and reflective activities.

Specific materials such as posters, digital tools (to test knowledge on the topic and perform carbon-footprint calculations), a cooperative "serious-game" and photo-elicitation activities have been developed for each phase of the initiative, which ends with the "One Minute Paper". The pilot experience involved 150 people, with an average execution time of 18 minutes.

The analysis of the data collected through the tool revealed the following priority areas for educational intervention: correlation between climate change and health, use and disposal of polluting materials, and food safety. Through the 'One Minute Paper' 75 actions were collected, oriented mainly towards changing daily habits and natural resources' management.

The results of the pilot highlighted the population's need for knowledge on environmental and health issues, and opened new areas for the development of the nurses' role within multi-professional teams in the implementation of awareness and environmental health promotion programs.

Key Words: Climate Change, Public Health, Planetary Health, Awareness-Raising, Health Promotion

ADVANCING NURSING SKILLS EDUCATION THROUGH INNOVATIVE DIGITAL TECHNOLOGY

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Introduction: The application of digital technology in nursing education significantly enhances the learning process and the development of clinical competencies. The integration of innovative platforms, such as IZZI, enables students to engage in interactive learning, independent knowledge acquisition, and a deeper understanding of complex nursing procedures. Digital solutions contribute to individualized learning, increased accessibility of educational materials, and the simulation of real clinical situations, which helps reduce initial stress among students as they transition into real healthcare environments.

Objective: This paper aims to present innovative methods for teaching nursing skills through the application of digital technology, using the IZZI platform as an example. The focus is on analyzing the advantages of digital learning approaches, as well as the potential challenges associated with their implementation in the educational process.

Expected Outcomes: The use of digital technology in nursing education offers numerous benefits, including interactivity, learning flexibility, adaptability to individual student needs, the ability to independently review procedures, and increased engagement and motivation. The IZZI platform facilitates a better understanding of complex clinical procedures, fosters self-directed learning and responsibility, and provides a safe environment for skill practice before working with patients. The educational content available on the IZZI platform includes theoretical knowledge, video tutorials, interactive exercises, and knowledge assessments, enabling structured and tailored learning of nursing skills. However, potential challenges include technological dependency, the need for additional teacher training, and technical difficulties that may impact lesson delivery.

Conclusion: The digital transformation of nursing education brings significant advantages in developing competencies among future nurses. The integration of the IZZI platform into the teaching process enhances knowledge acquisition, improves the quality of nursing skill execution, and increases student confidence. To ensure optimal implementation of digital technology in education, it is essential to focus on continuous adaptation of teaching methods, professional development for educators, and the advancement of technical support.

Key Words: nursing, education, digital skills, improvement, learning

IDENTIFYING AND VALIDATING PATIENT CLUSTERS IN CORONARY ARTERY BYPASS GRAFTING INTEGRATING AUTONOMIC FUNCTION WITH CLINICAL AND DEMOGRAPHIC DATA FOR PERSONALIZED CARE

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Background and Rationale:

This study aimed to identify distinct clusters of patients undergoing coronary artery bypass grafting (CABG) based on demographic, clinical, and autonomic function characteristics. The secondary aim was to validate these clusters by examining differences in their clinical outcomes and characteristics and to evaluate the predictive validity of the clusters by assessing their association with the sum of postoperative complications.

Objectives and Methods:

This study was a descriptive cohort study conducted following the Declaration of Helsinki in a single center with a high volume of cardiac surgical procedures in Italy. Data were collected prospectively at the individual level, beginning from the pre-anesthesia induction phase through to the post-anesthesia induction phase, and included comprehensive data on complications throughout the entire hospitalization period. The reporting of this study adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines. The ethical committee of San Raffaele Hospital authorized the study (prot. N. 40/int/2016, Clinical Trials registration no. NCT03169608). All patients provided written informed consent before their participation. Data collection started in April 2017 and continued up to January 2020. Inclusion criteria included adults aged 18 years and older who were scheduled to undergo CABG surgery in sinus rhythm and patients without definite autonomic nervous system disorders (e.g., diabetic neuropathy). Participants were required to provide written informed consent. Patients with severe non-cardiac comorbidities that significantly limited life expectancy, such as advanced malignancies, and those with contraindications to anesthesia or deemed unfit for surgery by the attending medical team were excluded. Data collection commenced at the pre-anesthesia induction phase, recording baseline demographic and clinical characteristics. This phase included detailed patient history, physical examination findings, and relevant laboratory and diagnostic test results. Cardiovascular function and autonomic nervous system activity were assessed during the pre-anesthesia induction phase (PRE) and after the induction of general anesthesia and the opening of the chest (POST).

The study involved the acquisition of 10 minutes of signals from electrocardiogram (ECG) and arterial pressure (AP), invasively derived from the radial artery for 10 minutes during both PRE and POST. The signals were taken from routine clinical monitors (Dräger Infinity Kappa XLT and Dräger Siemens SC 9000XL) and registered on a computer using an A/D board (National Instruments, Austin, Texas, USA) with a sampling frequency of 1 kHz. According to the institution's standard practice, patients underwent an intramuscular injection of 0.5mg of atropine and 100 µg of fentanyl one hour before PRE session.

Patients underwent the standard anesthesia protocol performed at the Department of Cardiothoracic and Vascular Anesthesia and Intensive Care, IRCCS Policlinico San Donato. As described elsewhere,¹⁵ patients received premedication with intramuscular atropine (0.5 mg) and fentanyl (100 µg) about 1 hour before reaching the operating theater. Anesthesia was then induced with an intravenous bolus injection of propofol (1 mg/kg) and an infusion of remifentanyl 0.2 µg·kg⁻¹·min⁻¹. Maintenance of anesthesia was achieved with a continuous infusion of propofol at 2-3 mg·kg⁻¹·h⁻¹ and a remifentanyl infusion range from 0.05 to 0.5 µg·kg⁻¹·min⁻¹. Additional inhalation agents (sevoflurane) could be used as requested. Subjects breathed spontaneously during PRE, while during POST, they were mechanically ventilated at a range of 12–16 breaths min⁻¹ with a 1:1 mixture of oxygen and air. These parameters were monitored up to the post-anesthesia induction phase, and clinical data were collected throughout the intervention.

Postoperative data collection was extended throughout the entire hospitalization period. Daily assessments were conducted, which included vital signs, laboratory results, and the occurrence of any complications. All data were systematically entered into a secure electronic database, ensuring confidentiality and compliance with data protection regulations. Regular data quality checks were performed to maintain accuracy and completeness. The following measures were recorded and analyzed to understand the characteristics and outcomes of the patient population. Demographic and clinical characteristics included age (measured in years), sex (categorized as male or female), and Body Mass Index (BMI), calculated as weight in kilograms divided by height in meters squared (kg/m²). The ejection fraction was recorded as a percentage. The type of procedure was noted, indicating whether the patient underwent CABG alone or CABG combined with other procedures. The New York Heart Association (NYHA) class was reported into its four categories based on the severity of heart failure. EuroSCORE II was also collected to predict in-hospital mortality based on patient and procedural factors after major cardiac surgery.²⁹

Comorbidities were assessed, including the presence or absence of diabetes, atrial fibrillation, chronic obstructive pulmonary disease (COPD), and others. Surgical urgency was categorized as elective versus urgent, indicating whether the surgery was planned or performed urgently.

Pre- and post-anesthesia cardiovascular function and autonomic nervous system activity were evaluated according to previous research.³⁰ The HP and SAP series were extracted from ECG and AP signals, respectively, with HP detected as the time distance between two consecutive R-wave peaks on the ECG and SAP as the maximum AP inside the HP. Series of 250 beats length were derived during both PRE and POST phases. Series were manually checked and corrected for ectopic beats and misdetections by a trained operator, interpolating them via linear interpolation between the two most closed reliable peaks. From the series, different markers evaluating autonomic and cardiovascular control were derived. Time domain markers in terms of mean and variance of HP and SAP were extracted, labeled as μHP , $\sigma^2\text{HP}$, μSAP , and $\sigma^2\text{SAP}$ and expressed in ms, ms², mmHg, and mmHg² respectively. Power spectral density was computed by modeling the series via an autoregressive model whose optimal order was chosen via the Akaike information criterion in the range from 8 to 14 and the power spectral density was then factorized into spectral components.³¹ A frequency component was labeled as in low frequency (LF) if its central frequency was in the range between 0.04 and 0.15 Hz or as high frequency (HF) if it was in the range of 0.15-0.4 Hz. The power of HP in the HF band was taken as an index of vagal modulation directed to the sinus node, while the power of SAP in the LF band was taken as an index of sympathetic modulation directed to the vasculature.³²

The power of HP in the LF band and the power of SAP in the HF band were derived as well. Indexes were expressed in absolute units (e.g. ms² and mmHg²) and labeled as LFHP, HFHP, LFSAP, HFSAP, and in normalized units (nu), computed as $HFnuHP = HFHP / (LFHP + HFHP)$ and $LFnuSAP = LFSAP / (LFSAP + HFSAP)$. The ratio LFHP/HFHP was computed to assess the sympathovagal balance.

BRS was computed according to the spectral method as the square root of the ratio between LFHP and LFSAP in the LF band and labeled as BRSLF and similarly as the square root of the ratio between HFHP and HFSAP in the HF band and labeled BRSHF.³³ BRS indexes were expressed in ms·mmHg-1

The complexity of the HP and SAP series was assessed according to a corrected conditional entropy approach, extracting a normalized complexity index (NCI) of HP and SAP (NCIHP and NCISAP, respectively).³⁴ Finally, a causality analysis was exploited to characterize the dynamical interactions between HP and SAP via the assessment of a model-based transfer entropy approach, which was able to quantify the degree of HP dependence on SAP and vice versa.³⁵ Defined the full universe of knowledge $\Omega = \{HP, SAP\}$ where SAP is the cause and HP the effect and defined the restricted universe of knowledge $\Omega/SAP = \{HP\}$, the transfer entropy from SAP to HP $TESAP \rightarrow HP$ was computed as the half-logarithm of the ratio between the variance of prediction error of HP in Ω/SAP divided to that computed in Ω .^{35,36} Reversing the role of the cause and the effect it is possible to compute $TEHP \rightarrow SAP$.

Postoperative complications and outcomes were recorded as well. Length of stay was measured as the number of days in the intensive care unit (ICU) and the total duration of hospitalization. Any postoperative complications were documented, including low cardiac output syndrome and postoperative death. The presence or absence of positive blood cultures was also noted. Initially, data in the overall sample were summarized according to the nature of each variable and its distribution. The missing data in this study was less than 5% and was managed under the assumption of being missing at random. Imputation algorithms based on regression were used for quantitative variables, while qualitative variables were imputed using appropriate categorical data imputation methods. The available information was simplified using the t-distributed stochastic neighbor embedding (t-SNE) algorithm to optimize the clustering process.³⁹ The variables included in this analysis were all the 23 collected quantitative variables: the 16 selected variables of cardiovascular and autonomic function assessed in the PRE phase (LFnuHP, HFnuHP, LF/HF Ratio, LFnuSAP, NCIHP, NCISAP, TESAP, $TESAP \rightarrow HP$) and POST phases (LFnuHP, HFnuHP, LF/HF Ratio, LFnuSAP, NCIHP, NCISAP, TESAP, $TESAP \rightarrow HP$) as well as age, BMI, ejection fraction, NYHA, ICU stay, hospital stay, and EuroSCORE II. These variables were condensed into two components that captured both linear and nonlinear information of the original variables. The t-SNE algorithm was configured after exploring the optimal perplexity value by visually inspecting scatterplots obtained with incremental perplexity values from 5 to 50. Perplexity in t-SNE is a parameter that reflects the number of close neighbors each point considers, balancing the local and global aspects of data structure during dimensionality reduction. A perplexity value of 20 was selected as the optimal setting, and the algorithm was executed with a seed value of 123 using the Rtsne library. As per recent methodological approaches, the two obtained components were plotted and subsequently used in a hierarchical clustering procedure with the cluster library.⁴⁰

The optimal number of clusters was selected based on the silhouette statistic, interpretation of the comparisons obtained by applying different cluster solutions, and analysis of the

resulting dendrogram.⁴¹ Once the most appropriate cluster solution was identified, pairwise comparisons for each collected variable were performed using two-tailed tests, with significance corrected using the Benjamini-Hochberg procedure. The most appropriate test based on the nature of the variable and its distribution was used, and exact tests were performed when possible. A Multiple Correspondence Analysis (MCA) was performed to validate the cluster solution using the categorical variables NYHA class, elective versus urgent surgery, and complications, which were not summarized in the two t-SNE components.⁴² The two t-SNE variables were categorized into five equal intervals to allow the MCA to handle their information. The clusters were visualized in the MCA biplot space with ellipses indicating their confidence intervals.

The sum of complications was used as an outcome in a Poisson regression model for criterion-based validation. Previous research based on balancing data-driven and theory-driven independent variable selection included variables with a bivariate relationship ($p < 0.15$).⁴³ This approach allowed for controlling confounding variables. Two predictors, LFnusAP POST, and LFnusAP PRE, were intercorrelated but deemed important for the model due to their distinct information. Collinearity was managed using the robust modified jackknife ridge estimator in the regression analysis, utilizing the glmnet library in the R environment.⁴⁴ Bootstrapping was employed to ensure robust estimates of the regression coefficients. The process involved several steps to achieve reliable results. The seed for reproducibility (seed = 456) was initially set to ensure consistent results across different analysis runs. Next, a range of lambda values for cross-validation was defined, covering a wide spectrum from very small to large values. Cross-validation was then performed to determine the optimal lambda value, which controls the strength of the penalty applied in the ridge regression model. This optimal lambda was used to fit the final ridge regression model, ensuring that the model was neither overfitted nor underfitted. Once the final model was fitted, the regression coefficients were extracted. To further validate these coefficients, a bootstrapping function was defined. This function repeatedly resampled the data with replacement, fitting the ridge regression model to each resampled dataset. This process allowed for the estimation of variability in the regression coefficients. Bootstrapping involved performing multiple iterations (1,000 in this case), each time resampling the dataset and refitting the model. The coefficients from each iteration were collected, and their distribution was analyzed to calculate 95% confidence intervals (95% CIs) and p-values. Analyses were performed with an alpha set at 0.05 using R version 4.2.2 (R Core Team, 2023).

Results or Expected Outcomes:

This study identified two distinct patient clusters, labeled as “Unfavorable Profile” and “Favorable Profile,” using clustering techniques based on demographic, clinical, and autonomic function data. Patients in the Unfavorable Profile cluster were generally older, had a higher prevalence of comorbidities such as diabetes and the onset of adverse events such as atrial fibrillation, and exhibited worse autonomic nervous system activity and cardiovascular function compared to those in the Favorable Profile cluster. The MCA confirmed the distinct profiles of the clusters, while Poisson regression demonstrated significant differences in outcomes between the clusters in terms of the sum of complications. These differences were associated with varying rates of postoperative complications, highlighting the need for personalized patient management strategies. Additionally, the study highlighted the significant impact of ICU stay duration, and LFnusAP acquired in POST on the rate of complications. Patients with longer ICU stays and lower LFnusAP during POST exhibited higher complication

rates, emphasizing the importance of these factors in patient management and outcome prediction. These differences highlighted the need for personalized patient management strategies based on these results.

The findings of this study both align with and extend the existing body of research on patient stratification and outcomes following CABG.⁴⁵ Previous studies have consistently demonstrated the importance of demographic and clinical characteristics, such as age, comorbidities, and preoperative health status, in predicting postoperative outcomes.^{1,3,5,45} Our study enriched these findings by identifying distinct clusters of patients with significant differences in these variables. Similar to prior research, this study emphasizes the heterogeneity among patients undergoing CABG.⁴⁶ For instance, studies have shown that older patients and those with multiple comorbidities are at higher risk for postoperative complications, which is consistent with the

characteristics of the Unfavorable Profile cluster identified in our study.⁴⁷ The significant role of comorbidities such as diabetes and atrial fibrillation in influencing patient outcomes has been well-documented.^{45,46} Our findings align with these studies, showing a higher prevalence of these conditions in the Unfavorable Profile cluster, which was associated with worse postoperative outcomes.

While traditional studies have used more straightforward statistical methods for patient stratification,^{45,47} this study utilized advanced clustering techniques, including t-SNE and hierarchical clustering, to identify patient profiles based on a comprehensive set of variables. This approach provided a more nuanced understanding of patient heterogeneity and allowed for identifying clusters with distinct autonomic function profiles. One of the novel aspects of this study is the focus on autonomic nervous system modulation, measured through variables typical of HP and SAP variability and cardiovascular control assessment.^{19,30} Previous research has primarily focused on clinical and demographic factors, but our findings highlight the significant impact of autonomic function on patient outcomes. While previous studies of our groups highlighted the link of autonomic and cardiovascular control impairment with the development of post-surgery adverse events,^{6,7,15,19} a t-SNE and hierarchical clustering approach considering the impact of several markers on the sum of complications has not been tested so far. The Unfavorable Profile cluster exhibited worse autonomic nervous system activity, which was associated with higher rates of complications. This insight suggests that autonomic nervous system activity could be crucial to patient recovery and warrants further investigation.

The clustering approach used in this study helps to better understand patient profiles and has practical implications for clinical practice. The significant impact of autonomic nervous system activity on patient outcomes suggests that integrating these measures into future early warning systems, which require future testing and validation procedures, could enhance patient monitoring and risk stratification. Specifically, the regression model identified LFnuSAP during POST as significantly associated with the sum of complications, indicating that lower values of LFnuSAP and, thus, a particularly reduced sympathetic modulation during POST were linked to higher complication rates.³³ Developing new early warning score systems, informed by the insights from this clustering approach, could provide timely alerts for potential complications, allowing healthcare providers to intervene earlier and tailor treatment strategies more effectively.

In addition, given the emerging role of the autonomic nervous system activity on patient outcomes, even if it still requires additional studies to be more in-depth comprehended, some methods have shown promise in improving autonomic nervous system activity preoperatively and involve educational activities in line with the scope of practice of nurses, and of multidisciplinary teams.^{28,48,49} Educational activities can include stress management programs, lifestyle modifications, and the implementation of non-invasive brain stimulation techniques.^{48,49} Another promising method is biofeedback, which involves training patients to improve their health by controlling physiological processes that are typically involuntary, such as heart rate, muscle tension, and blood pressure.⁴⁹ In this regard, biofeedback has been shown to enhance autonomic regulation by increasing heart rate variability and balancing sympathetic and parasympathetic activity, even if we have to acknowledge that more research is needed to draw solid recommendations.⁴⁹ This technique helps to empower patients to actively participate in their own care, potentially leading to better preoperative autonomic function and improved postoperative outcomes; however, this approach could be useful only in selected patients eligible for CABG.

Future research should aim to validate the clustering models used in this study across different populations and settings. These studies would ensure the generalizability of the findings and refine the clustering algorithms for broader applications. Research should focus on developing standardized protocols for measuring and interpreting autonomic function measures and determining their predictive value for different outcomes. Long-term follow-up studies are

necessary to understand the sustained impact of patient stratification and personalized care approaches on outcomes beyond the immediate postoperative period. These studies could track patient recovery, quality of life, and long-term survival.

Despite the valuable insights provided by this study, several limitations need to be acknowledged. The study was conducted in a single center with a high volume of cardiac surgical procedures and high rates of emergency procedures. These aspects may limit the external validity of the findings to other settings with different patient populations, surgical volumes, and care practices. Although the sample size was determined using Monte Carlo simulations and deemed sufficient to detect significant differences in postoperative outcomes, the range of 140 to 160 patients may still limit the robustness of the findings. Larger, multi-center studies are needed to confirm these results and ensure broader applicability, including outcomes such as mortality, which will require samples adequately powered for this purpose. The indices used to measure autonomic function and cardiovascular control are complex and require precise methodology. For this reason, this study followed the approach previously described to assess these signals.³⁰ Variations in how these measures are obtained and interpreted could influence the results. In addition, the practical integration of the employed clustering techniques requires further validation and simplification and the development of simple tools (e.g., new early warning score systems or cluster-based stratification risk tools). The study focused on immediate postoperative outcomes during hospitalization. Long-term follow-up data would provide a more comprehensive understanding of how patient clusters impact recovery, quality of life, and long-term survival. While the study accounted for many relevant variables, there may still be unmeasured confounding factors that could influence the results. Future studies should aim to include a broader range of variables to capture the full spectrum of factors affecting postoperative outcomes.

Conclusion and Implications:

This study contributes to the growing body of evidence supporting personalized cardiovascular care and highlights the potential of advanced clustering techniques to improve patient outcomes following CABG. Two distinct patient clusters were identified, labeled as “Unfavorable Profile” and “Favorable Profile,” using a comprehensive set of demographic, clinical, and autonomic function variables. Patients in the Unfavorable Profile cluster were generally older, had a higher prevalence of comorbidities such as diabetes and atrial fibrillation, and exhibited worse autonomic nervous system activity and cardiovascular function compared to those in the Favorable Profile cluster. The cluster analysis and subsequent validation using MCA and Poisson regression highlighted significant differences in postoperative outcomes between the clusters. Patients in the Favorable Profile cluster had significantly fewer complications, emphasizing the importance of personalized patient management strategies. The findings help nurses and the broader multidisciplinary team implement tailored care approaches based on detailed patient profiles and pave the way for future practical applications, such as developing cluster-based risk stratification tools or early warning score systems. Future research should focus on validating these clustering models across diverse populations and settings, exploring the integration of autonomic function measures into routine clinical practice, and investigating the effects of preoperative interventions designed to improve autonomic regulation. Long-term follow-up studies are also necessary to understand the sustained impact of patient stratification and personalized care approaches on outcomes beyond the immediate postoperative period.

Key Words: Cardiovascular nursing; Coronary artery bypass grafting; Clustering analysis; Autonomic function; Personalized care; Patient outcomes; Hierarchical clustering; Postoperative complications; Patient stratification; Personalized cardiovascular care.

THE FUTURE OF BLOOD TRANSFUSION IN HEMATOLOGICAL DISEASES – LEUKAPHERESIS

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Leukapheresis is an emerging medical procedure used to selectively remove white blood cells from the blood, helping to manage patients with hematological diseases, particularly when there are high white blood cell counts, such as in leukemia. This technique reduces complications related to leukostasis and offers an alternative to traditional blood transfusions. The future of blood transfusion therapy in hematological diseases may increasingly rely on procedures like leukapheresis, along with advancements in gene therapy and artificial blood products. The Role of the Nurse in healthcare is vital and multifaceted. In the context of blood transfusions and leukapheresis, nurses play a crucial role in the following ways; monitoring and assessment, patient education, collaboration with healthcare team, technical skills. At the University Clinical Hospital Mostar, leukapheresis can be illustrated through a case study where, through the findings, we can observe how much the method itself helped, and the role of the nurse is of utmost importance both psychologically and professionally. Laboratory results before the procedure: leu 126.4×10^9 Laboratory results 1 hour after the procedure, after 5 cycles: leu 110.9×10^9 Laboratory results at the end of the procedure, after 20 cycles: leu 83.4×10^9

A therapeutic leukapheresis was performed, with a total of 20 cycles of processed blood. The procedure was completed successfully, lasting 5 hours and 40 minutes. During the procedure, analgesic therapy was administered: Analgin amp i.v., Ca gluconate 10% amp i.v. Transfusion medicine is a field of medicine that is closely linked to the healthy population and patients who need blood and blood products. Therefore, alongside all technological advancements that are welcome, humanity and compassion remain the foundation of this profession.

Key Words: nursing, leukapheresis, technology

INTEGRATING CLIMATE AND GENDER JUSTICE INTO SUSTAINABLE NURSING

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Introduction: The ECOALITY: „Youth and the Local Community for Climate and Gender Justice“ project is a European initiative that brings together multiple organizations and countries within the European Union to raise awareness of environmental crises and their impact on public health, while promoting active citizenship among young people. Within the project, students and educators from the School of Nursing Vinogradska actively participate in interdisciplinary activities designed to explore the interconnections between environmental sustainability, health, and social equity. Particular emphasis is placed on linking climate and gender justice with sustainable development in nursing, recognizing the critical role of nurses in identifying health challenges arising from environmental changes and implementing preventive health strategies.

Objective: This paper aims to examine how the ECOALITY project integrates climate and gender justice into sustainable nursing development, emphasizing the significance of health literacy, environmental awareness, and disease prevention in contemporary nursing education and practice.

Expected Outcomes: The project is expected to enhance nursing competencies across three fundamental domains. Health literacy and disease prevention focus on understanding the environmental determinants of health and equipping nurses with the skills to educate patients on sustainable healthcare practices. Gender justice and healthcare emphasize the recognition of specific health needs among vulnerable populations, particularly regarding access to reproductive and sexual health services in the context of environmental crises. Sustainable development in nursing promotes the adoption of environmentally responsible healthcare practices, including efficient resource utilization and sustainable medical waste management. Through participation in Ekopolis laboratories, workshops, and international exchange programs, students gain in-depth knowledge of climate change impacts on public health while simultaneously developing critical skills in patient education, preventive healthcare, and advocacy for sustainable health policies. The project aims to empower future nurses to recognize and address the intersection of climate change and public health, enabling them to integrate this knowledge into preventive medicine, health education, and the protection of at-risk populations.

Conclusion: Participation in this European initiative strengthens sustainability awareness within the nursing profession, advances the education of future nurses, and reinforces their role in public health advocacy and health literacy amid evolving environmental and social challenges.

Key Words: nursing, sustainable, climate justice, gender justice, environmental awareness

CURRICULUM APPROACH IN NURSING EDUCATION

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The curriculum approach in nursing education plays a crucial role in designing a quality teaching process that enables the acquisition of competencies necessary for effective nursing practice. This paper analyses the impact of the curriculum on the teaching content of the course Nursing Process. The research aims to evaluate the learning outcomes of this course within the core curriculum of undergraduate nursing studies in Croatia and compare them with the curricula of eleven higher education institutions.

Objectives and Methods: An analysis of the core curriculum for undergraduate nursing studies (CORE CURRICULUM) was conducted, along with a comparison of the learning outcomes from the implementation plans of the course Nursing Process for the academic year 2022/2023 at eleven higher education institutions in Croatia. Data were collected from the websites of universities, and a quantitative analysis was performed to determine the frequency and distribution of individual learning outcomes.

Results or Expected Outcomes: The results revealed variations in the number and structure of learning outcomes across institutions. In 90.91% of the curriculum implementation plans, learning outcomes were clearly defined. The most common outcome was "Assess the patient's condition" (72.73%), followed by "Formulate a nursing diagnosis" and "Create a nursing care plan" (63.64%). Other significant outcomes included "Describe, explain, and apply the nursing care process", "Implement planned nursing care", and "Document nursing care" (54.55%). Outcomes such as "Identify nursing care needs" and "Evaluate the nursing care provided" were present in 45.45% of the curricula.

Conclusion and Implications: Although the curriculum approach ensures quality education for nurses, the observed differences in the structure of learning outcomes highlight the need for standardization across institutions. Regular revision of curricula is essential to align them with the evolving needs of modern nursing, ensuring consistency and maintaining high educational standards.

Key Words: Curriculum, Nursing Education, Nursing Process

SOCIAL-MEDIA COMMUNICATION BY NURSING DEGREE STUDENTS: A STRUCTURED ANALYSIS OF TIKTOK VIDEOS

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Beyond private use, the use of social-media by nursing professionals not only concerns phenomena of scientific dissemination or entertainment but has repeatedly concretized in questionable manners around the world. International media have reported several cases of unfair use, which should draw attention to the need for widespread education on the proper use of these powerful communication tools, starting from basic training years. In Italy, studies concerning the use of these digital platforms by nursing students remain limited.

OBJECTIVES AND METHODOLOGIES: This study aimed to assess how nursing students presented their internship activities on one of the most widely used social-media platforms: TikTok. Adapting the JBI methodology for Scoping Review and the PRISMA-SCR framework, a structured search was performed on TikTok in September 2024. Of the 2320 videos screened in the search, 175 videos were included in the content analysis, carried out by categorizing the videos into pre-defined categories, using descriptive statistics, performing a quality assessment with two different validated scales, and, finally, assessing the content's ethical and legal issues. Relationships between variables were examined through a correlation matrix.

RESULTS: The content was categorized as "Entertainment" videos 146 times, "Informational" videos 33 times, and "Educational" videos 13 times. The total number of views at the data collection was 2,781,487 views; the quality of the videos was generally low. The correlation matrix found numerous statistically significant relationships, in line with modern communication theories and similar studies. About 30% of the videos presented possible ethical issues, and about 17% presented possible legal issues, including photos or videos of patients, readable names on test tubes, incorrect nursing practices, and photos of anatomical specimens during/after surgical procedures.

CONCLUSIONS: Collaboration between universities and professional nursing associations is needed to enhance early deep education on social-media use and possible consequences of misuse.

Key Words: Communication, Nursing Students, Nursing Education, Social, TikTok

ASPIRATIONS AND CHALLENGES IN THE PROCESS OF IMMUNIZATION

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Association of Health Workers and Associates of the Republic of Serbia Esculap

When it comes to immunization on the territory of the Republic of Serbia, it is regulated from several aspects and through several legal acts. Vaccines help protect population from serious diseases and therefore play a central role in reducing mortality and keeping healthy population. In modern times, immunization has become a victim of its success, because many diseases have become so rare that some people believe that they have been eradicated forever, so they do not realize the benefits of it.

Immunization is in most cases the most effective measure in preventing and controlling infectious diseases. Infections caused by the human papillomavirus (HPV) are one of the most common sexually transmitted diseases. Vaccines against diseases caused by HPV have been in use for more than 15 years, and in our country for a little more than two years. And while some Scandinavian countries have already come close to eliminating cervical cancer, we are at the very beginning of that challenging process.

The work itself will be conceived from the aspect of the most common challenges in the field and problems in the framework of immunization, but also the efforts to overcome them.

Key Words: immunization , human papillomavirus, cervical cancer

SEPSIS EDUCATION IN NURSING: A CROSS SECTIONAL STUDY OF STUDENTS' KNOWLEDGE ACROSS CROATIAN, CYPRIOT, AND GREEK UNIVERSITIES

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Background: Sepsis is a leading cause of morbidity and mortality worldwide, requiring timely recognition and intervention. Nurses play a crucial role in early sepsis detection and management. However, gaps in nursing students' knowledge may impact future clinical outcomes. This study aimed to assess nursing students' knowledge of sepsis and its symptoms across three European countries: Croatia, Cyprus, and Greece.

Methods: A cross-sectional study was conducted among 626 undergraduate nursing students from at least one university in each country. Data were collected using a validated questionnaire assessing knowledge of sepsis and its symptoms. The results were analyzed using ANOVA and chi-square tests to determine differences in knowledge levels across countries and years of study.

Results: Statistically significant differences were found in sepsis knowledge among nursing students from different countries ($F(2.625) = 4.254$, $p = 0.015$). Cypriot students demonstrated a significantly higher level of knowledge compared to Greek students ($p = 0.016$), while no significant differences were observed between Croatian students and the other two groups. Further analysis revealed that students in higher years of study generally exhibited better knowledge.

Discussion: The findings indicate variability in sepsis education among nursing curricula in these three countries. This highlights the need for harmonization of educational content to ensure that all nursing students acquire the necessary competencies for early sepsis recognition and management. Simulation-based learning and standardized protocols could be effective tools in improving knowledge retention and clinical preparedness.

Conclusion: Nursing students' knowledge of sepsis remains suboptimal, with notable differences between countries. Given the critical role of nurses in sepsis care, nursing curricula should include more structured and comprehensive training on sepsis recognition and management. Future research should focus on longitudinal studies to evaluate the effectiveness of targeted educational interventions.

Keywords: sepsis, nursing, education, knowledge

EXPLORING GENDER DIFFERENCES IN PATIENT ENGAGEMENT: A SCOPING REVIEW

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Introduction: Patient-centered healthcare emphasizes patient engagement as a critical factor in improving outcomes. Despite gender's impact on healthcare, gender-specific dimensions of engagement remain insufficiently investigated.

Objective: To explore, map, and synthesize gender differences in patient engagement, providing an in-depth analysis of the most effective tools for enhancing engagement.

Methods: A scoping review was conducted following JBI guidelines and the PRISMA-ScR checklist. The databases consulted were MEDLINE, CINAHL, PsycINFO, Embase, and Scopus. Two independent authors conducted the selection process blindly.

Results: Five studies were included. They explored engagement tools across gender differences, highlighting effective strategies. Mobile health interventions with structured tasks and therapist support enhanced engagement among women by fostering accountability. Gamified interventions promoting participation through competition and social interaction improve engagement in men. Peer-led, gender-affirming programs tailored to transgender women improved engagement by addressing stigma and identity needs. Text messaging interventions maintained high engagement across genders, demonstrating long-term behavior change.

Conclusions: Engagement levels vary between genders and are influenced by education and age range. Determining the most effective engagement tool is challenging, as each included study measured engagement using different outcomes and did not use validated scales that would allow for comparisons between the different tools.

Key Words: Engagement, Gender, Gender identity, Involvement, Patient activation, Patient engagement, Patient participation

SELF-CARE BEHAVIORS IN OLDER ADULT AFFECTED OF MULTIPLE CHRONIC CONDITIONS LIVING IN A LOW- AND MIDDLE-INCOME COUNTRY AND ITS VARIABLES ASSOCIATED

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Objective: To explore the socio-demographic and clinical factors influencing self-care behaviors among older adult with multiple chronic conditions (MCCs) living in a low-and middle-income country (LMIC).

Methods: Two hundred eighty-six patients were enrolled from community and outpatient settings in Albania, a LMIC. Eligibility criteria included being ≥ 65 years and a diagnosis of heart failure, diabetes mellitus, or chronic obstructive pulmonary disease (COPD), along with at least one additional chronic condition. The Self-Care of Chronic Illness Inventory (SC-CII) was used to measure self-care maintenance, monitoring and management behaviors. The Patient Health Questionnaire-9 (PHQ-9), Perceived Stress Scale (PSS), Multidimensional Scale of Perceived Social Support (MSPSS) were used to measure depression, stress and perceived social support, respectively. The relationship between self-care behaviors and associated variables was assessed by multivariate regression models.

Results: MCCs patients had an average age of 74.15 years (SD 6.36), with a majority being female (56%) and with a low education level (61% had ≤ 8 years of scholaryty). Patients reported a moderate level of depression (mean=17.32, SD=6.43), stress (mean=7.82, SD=4.42) and perceived a high social support (mean=4.61, SD=1.09). Self-care maintenance, self-care monitoring and self-care management were significantly and positively associated with high perceived social support ($\beta = 4.33$, $p < 0.001$; $\beta = 5.64$, $p < 0.001$; $\beta = 5.64$, $p < 0.001$, respectively) and female ($\beta = 6.16$, $p < 0.05$).

Conclusion: In older adults with MCCs and living in a LMIC interventions focused on improving self-care behaviors should consider perceived social support level and consider and gender-specific differences.

Keywords: age, chronic obstructive pulmonary disease, depression, diabetes mellitus, gender, heart failure, low- and middle-income countries, multiple chronic conditions, self-care, perceived social support, stress.

CRITICAL CARE COMPETENCE: EVALUATING AN ONLINE ICU TRAINING PROGRAM FOR NURSING STAFF

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Introduction. Few e-learning courses in critical care were specifically designed for nurses, and many existing programs did not adequately address their unique educational needs.

Aim: This study aimed to develop and evaluate an online e-learning course tailored to the educational requirements of intensive care unit (ICU) nurses, covering fundamental principles and procedures.

Methods. The educational needs of 55 ICU nurses were collected through a survey, revealing key topics such as Arterial Blood Gases interpretation, extracorporeal membrane oxygenation management, and early mobilization techniques. Based on these insights, a comprehensive online training program was created, consisting of nine virtual meetings and 20 case studies. Post-course feedback was collected via a semi-structured, open-ended survey and analyzed using a content analysis method.

Results: Three central themes emerged: peer-to-peer comparison, the creation of a supportive learning environment, and opportunities to acquire practical knowledge and skills directly applicable to patient care. The educational strategy enhanced participants' clinical competencies and promoted collaboration and mutual learning among novice and experienced nurses. By addressing nurses' specific needs, the e-learning program improved knowledge acquisition and skill development, enabling nurses to better align theoretical concepts with practical application. Furthermore, the online format provided flexibility, allowing participants to engage on their schedules.

Conclusion. This study underscores the potential of tailored e-learning courses to enhance the expertise of novice nurses while refining the skills of experienced professionals, ultimately contributing to higher-quality care in the ICU.

Key Words: ICU, E-learning, skills, competence, learning environments

THE IMPORTANCE OF EDUCATION ON THE PREVENTION OF HEALTHCARE-ASSOCIATED INFECTIONS IN NURSING AS PART OF THE LIFELONG EDUCATION OF NURSES

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Nurses and technicians are involved in all aspects of working with patients. With a well-designed education model, we can significantly impact the spread of healthcare-associated infections by reducing mortality, morbidity, and cost of care. The de novo training model provides nurses and technicians in the Republic of Croatia with the same basic knowledge and thus has a direct impact on reducing infections and their consequences.

Training objectives: to expand and apply knowledge in the prevention and control of infections and to train participants to independently apply the acquired skills in practice. The course is intended for nurses/technicians in the Republic of Croatia at all levels of education.

The training includes standard protective measures, specific protective measures based on the mode of transmission of pathogens and prevention of infections associated with invasive procedures and devices. Safety and prevention are part of all three areas of training.

The course combines lectures, demonstrations and practical exercises that enable participants to acquire the knowledge and skills necessary for effective prevention and control of healthcare-associated infections in their daily work.

From 2023-2025, three 1st category courses "Basics of Prevention and Control of Healthcare-Associated Infections in Nursing" were held, attended by nurses/technicians from all over Croatia with different levels of education. . The participants wrote a pre-test and a post-test on knowledge and evaluation of the Course. Participation was voluntary, and the questionnaire and knowledge test were validated as part of a doctoral dissertation.

The aim of the study is to determine whether training of registered nurses in the basics of HCAI prevention and control of healthcare-associated infections is necessary or whether they acquire sufficient knowledge through other training and workplace practice, and to investigate their opinions about the Course.

The data were analysed using descriptive statistics and preliminary results will be presented.

Key Words: prevention and control of healthcare-related infections, lifelong education, nurses/technicians, curriculum, education

FAMILY PSYCHOSOCIAL PROBLEMS WITH CHILD PATIENTS CARED FOR IN THE INTENSIVE CARE UNIT: A FAMILY PERCEPTIONS

Titin Sutini S.kep., Ners., M.kep, Prof Suryani Suryani S.Kp., MH.SC., Ph.D, Prof Yanny Trisyani S.Kp., MN., Ph.D

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The family has an essential role in the nursing care process for children in the intensive care room; this aligns with the PFCC (Patient Family Center Care) model. Involving the family in the implementation of nursing services requires a healthy family condition, both physically and psychologically. When a child is sick, it will cause various changes in the family that can be a stressor to the physical, psychological, and family environment. This stressor is known as a psychosocial problem. If the family has psychosocial issues, the family cannot be involved in the nursing care process for the child. Therefore, the study began by exploring the psychosocial problems of the family from the perception of the family who accompanies the child in the critical care room.

Patients and methods: The research design used is descriptive qualitative. This method aims to describe or depict problems, events, and facts systematically and accurately. The data collection technique used was FGD (Focus Group Discussion). The respondents in this study were 20 partisipan. Respondents in this study were families of pediatric patients treated in intensive care rooms at two regional hospitals in West Java.

Results: The results of the study found six problems in the families of pediatric patients in the intensive care room, namely anxiety and sadness, feelings of guilt (feeling guilty), family financial conditions, blaming each other among family members, trauma from previous experiences, and penance by exchanging positions with the patient. The six problems were caused by various conditions and situations of the participants, some of which caused conflict in the family. The specific one for children was penance by exchanging positions with the patient. All participants expressed this.

Conclusion: All participants were able to express their problems both individually and as family problems; four individual issues, namely anxiety and sadness, feelings of guilt, trauma from previous experiences, and penance exchanging positions with the patient. Two more problems impact the family, namely the family's financial condition and blaming each other among family members. **Suggestion:** basic data can be created to determine nursing problems and interventions according to the problem.

Keywords: intensive care, family psychosocial, pediatric patients.

MEASUREMENT PROPERTIES OF THE MUTUALITY SCALE IN OLDER ADULTS WITH MULTIPLE CHRONIC CONDITIONS AND THEIR CAREGIVERS

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INTRODUCTION: The relationship quality (Mutuality) between patients affected by multiple chronic conditions (MCCs) and their caregivers is essential for improving health outcomes of both members. Mutuality is measured in patient-caregiver dyads with different instruments. To our knowledge, the 15-item Mutuality Scale (MS) has never been validated in MCCs patients and their caregivers.

AIM: This study aims to investigate the psychometric properties (validity and internal consistency reliability) of MS on patient affected by MCCs and their caregiver.

METHODS: A Multicenter cross-sectional design was used. Factorial validity was tested with confirmatory factor analysis. Internal consistency reliability was investigated with the model-based internal consistency reliability index. Pearson's correlation coefficient was used to test convergent validity between mutuality and other theoretical and empirical variables associated with it.

RESULTS: A sample of 406 MCCs patients- caregiver dyads was enrolled. Patients had a mean age of 74.9 years, with 54% being female, and an average of 2.5 chronic conditions. Caregivers had a mean age of 48 years, of whom 67.5% were female, and 38% were the patients' children. The CFA testing the theoretical four-factors (love, shared pleasurable activities, shared values, and reciprocity) of mutuality demonstrated adequate fit to the data in both the patient and caregiver version of the scale. Reliability estimates were adequate for the whole scale. Correlations were observed between mutuality and self-care behaviors, and positive aspect of caregiving, supporting convergent validity. **CONCLUSIONS:** The Mutuality Scale demonstrated satisfactory structural and convergent validity and reliability in MCCs patient-caregiver dyads.

KEYWORDS: Multiple Chronic Condition, Mutuality Scale, dyad, relationship quality, psychometric properties, Validity, Reliability,

EFFECTIVENESS OF VIRTUAL REALITY AND BUZZY® DEVICE IN REDUCING PAIN AND ANXIETY DURING PEDIATRIC VENIPUNCTURE

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Background and Rationale: Venipuncture is a procedure for blood sampling and therapy but challenging in pediatric patients due to anxiety and low cooperation. Difficult vein access can cause pain, complications, and distress for children and parents. Needle procedures often lead to lasting psychological effects like needle phobia and increased pain sensitivity. Non-pharmacological strategies, including audio-visual distraction and cryotherapy, help reduce pain and stress, but data on effectiveness, procedure duration, and economic impact remain limited.

Objectives and Methods: This randomized, controlled, single-blind study evaluates the effectiveness of Virtual Reality (VR) and Buzzy® (vibration and cryotherapy device) compared to standard care venipuncture at a Northern Italy pediatric unit. Children aged 3 to 17 years will be randomly assigned to VR, Buzzy®, or Standard Care.

In the VR group, patients will wear VR goggles and headphones two minutes before venipuncture, watching a 3D animated video until 10 minutes post-procedure. In the Buzzy® group, the device will be applied 60 seconds before venipuncture, then repositioned 3–5 cm above the puncture site and kept in place for 10 minutes post-procedure. The Standard Care group will undergo routine venipuncture.

Pain and anxiety will be assessed using Wong-Baker FACES Pain Scale, Numerical Rating Scale, and Children's Fear Scale. Additional data collection includes venipuncture frequency, medical supply usage, and procedure duration. Statistical analyses will be performed using ANOVA in SPSS v.25.

Results or Expected Outcomes: This study is expected to show that VR and Buzzy® reduce procedural pain and distress, improving venipuncture efficiency and cost-effectiveness. VR may provide a stronger immersive distraction effect, while Buzzy® may offer additional physiological analgesia through vibration and cold application.

Conclusion and Implications: If effective, VR and Buzzy® could be integrated as standard non-pharmacological interventions, improving pain management and reducing healthcare costs. These findings could inform evidence-based guidelines for pediatric procedural pain reduction.

Key Words: Venipuncture, pediatric pain management, virtual reality, buzzy® device, distraction techniques, non-pharmacological interventions

DEVELOPMENT OF RHEUMATOID ARTHRITIS AND NURSES ACTIVITIES

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ABSTRACT:

BACKGROUND: Arthritis is an inflammatory disease that most often affects the joints. The disease begins with an autoimmune reaction at the level of the joint sheath, which consists of one layer of cells (, which progresses as an inflammatory process that becomes more pronounced. In the clinical status of rheumatoid arthritis, there is swelling and pain in the peripheral joints of the hands and feet, the disease can also affect other joints of the body. The disease usually begins with fatigue, low temperature and anemia and only later affects the joints. During the disease, the joint capsule thickens due to excessive production of synovial fluid from inflammatory processes.

AIM: The aim of the work was literature review of published in the relevant electronic databases of biomedical data, find evidence and the way rheumatoid arthritis occurs.

MATERIAL AND METHODS: Using the key words "rheumatoid arthritis", "the onset of rheumatoid arthritis", "the consequences of the onset of rheumatoid arthritis", a large number of publications were obtained, a large number of which turned out to be irrelevant, after the exclusion of works older than five years, works whose full text was not available and those that were not written in English, 7 works were included in this work.

RESULTS: When the disease gradually subsides and is in remission, physical therapy and medical rehabilitation are applied. In the acute phase, cryotherapy can be used for its analgesic and anti-inflammatory effect.

CONCLUSION: Rheumatoid arthritis is a chronic inflammatory disease that occurs gradually, so that with good education and patient familiarization with the symptoms and early signs of the disease, it can be successfully treated.

LEADING HOSPITAL ROUNDS MEANS TO BE IN THE CONSTANT CONTACT WITH YOUR TEAM

Phd Brankica Rimac

Kindergarden „Potočić tuheljski“

Through the history of methods and ways of menegement are subject to constant changes, and the job of the leader is to "lead the employees towards success". The success of an organization depends on every employee doing their part. Therefore, it is extremely important to: collaborate, respect, accomplish tasks not personal wishes, link personal goals with the goals of the organization, responsibility and clarity of the task. Task Training is a continuous process of cooperation that provides direction, feedback, and encouragement with the intent of enhancing employee efficiency, organization and performance alone.

Therefore, the question arises whether we want people in managerial positions sitting in a comfortable room to be protected by things and people in the immediate environment, or are we prepared to walk with the open eyes among employees, in this case among patients, students, students in practice, visits and many who are in our work environment. Sometimes in a "round" you can see a lost person in the vast hospital corridors and point it to the right path, but you can also see how many employees have passed the same person. The choice is ours, but if we accept it, we have to live it. If we build a wall between the leader and the team, our team will not be able to learn, see our skills and gain the benefit of our experience.

Relationships can be a significant factor of success, we will better understand motivation in the team, finde the right solutions for the needs of our people.

It is not a walk through the park: it's an investment - a decisive and true effort invested in staffing, in order to work efficiently by respecting, Code of Ethics, Patient Rights and Patient Safety.

Key Words: relationship, walk, personal,contact

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