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Effect of a Mindfulness Application on Nurse Anesthesia Student's Stress and Anxiety

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Abstract

Background Literature: Nurse Anesthesia education placed high demands on students both personally and professionally. High levels of anxiety affect student's mental, emotional, and physical well-being, which impacts their student success. Whereas more research has focused on the health and well-being of graduate students, far less has focused specifically on nurse anesthesia students (SNRAs), who may experience higher levels of anxiety due to the rigor of their academic program. Current literature describes stressors experienced by SRNAs which cause anxiety and affect their performance include personal, academic, clinical, interpersonal, emotional, and financial.
Theoretical Framework: Jean Watson Caring Theory.
Sample: DNP-NA 2025 and DNP-NA 2024 cohorts (N = 36). Eighteen (66.7%) students participated in the study. Instrumentation: The DASS-21 was used to measure stress (7 items; α = .87) and anxiety (7 items; α =.74) from the participants.
Intervention: Mind shift meditation app, based on cognitive behavioral therapy, is being used daily before clinical and exams to decrease nurse anesthesia students' stress and anxiety over time.
Results: At baseline, the students exhibited a moderate level of stress, but their anxiety levels were low. The range of scores was 4-21 (out of 27) for stress (M = 12.88; SD = 5.40) and 0-16 (out of 27) for anxiety (M = 6.81; SD = 5.04). Both stress and anxiety were normally distributed [SW = .242 (stress); SW = .210 (anxiety)], without any outliers. There was a significant difference between their stress and anxiety levels (t = 5.55; p< .001) at baseline. Stress and anxiety will be measured over time with the change analyzed using a repeated measure ANOVA
Implications for Practice: The use of purposeful mindfulness meditation has been shown to decrease stress and anxiety in nursing students. The results of this study are ongoing and will be completed in time to be presented at the 2024 conference.

The OCTN2 Inhibitor Meldonium as a Potential New Treatment Option for Glioblastoma?

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Abstract

Glioblastoma (GBM) is the most aggressive malignant brain tumor in adults. Despite multiple treatment approaches, the median survival time of GBM patients is still only 15 months. GBM is highly resistant to treatment, mainly due to tumor heterogeneity, the infiltrative growth and metabolic adaptation to changing micro environmental conditions. Recent studies have shown that β-oxidation of fatty acids can promote GBM progression and serves as an alternative energy source involved in GBM metabolic plasticity. OCTN2 (SLC22A5) and its substrate L-carnitine (LC) are necessary for mitochondrial β-oxidation to function properly. Therefore, we performed a comprehensive analysis of the importance OCTN2/LC system in GBM pathogenesis. Compared to the healthy brain, OCTN2 expression was increased in GBM samples at both mRNA and protein levels. Importantly, high OCTN2 expression was associated with a poor prognosis in GBM patients (median survival: 8.4 vs. 19 months). Patients with a homozygous -207G/G genotype showed improved median survival (23.3 months) compared to those with a -207C/G (8.6 months) or -207C/C genotype (11 months). In addition, the OCTN2 inhibitor Meldonium significantly reduced in vivo tumor growth in an orthotopic mouse model with implantation of GL261 GBM cells. Real-Time ATP Rate assays showed that treatment of GL261 cells with LC stimulated ATP production, especially mitochondrial-based ATP production, whereas Meldonium reduced mitochondrial and total ATP production. Next, we tested the efficacy of Meldonium as experimental therapy on three patients with end-stage recurrent GBM. Meldonium was well tolerated, and in one of the patients a long-term growth arrest of more than 18 months was achieved. Altogether, our data indicate a potential role of the OCTN2/LC system in GBM pathogenesis. Further, our data indicate patient-specific differences in response to Meldonium, which argues for a detailed analysis of underlying molecular patient characteristics to identify subgroups that respond to Meldonium.

Photobiomodulation, as Additional Treatment to Traditional Dressing on Hard-to-Heal Venous Leg Ulcers, in Frail Elderly with Municipality Home Healthcare

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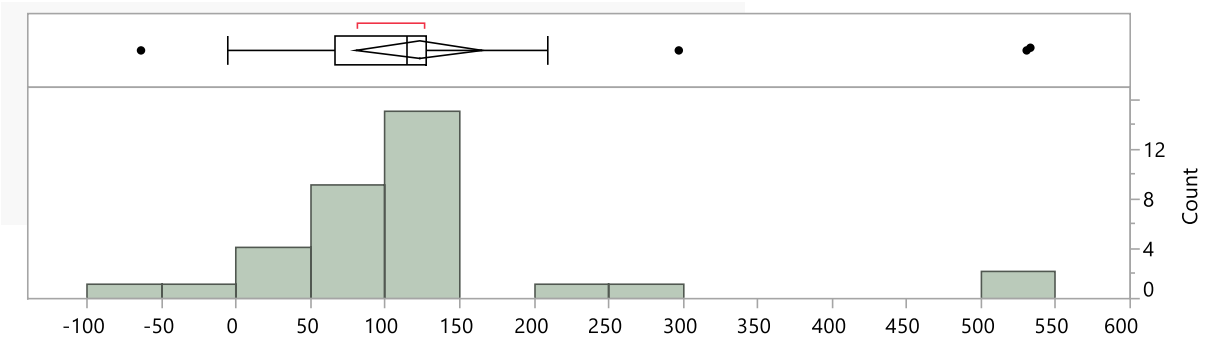
Abstract

Aim: Aim of the study was to evaluate if adding laser Photobiomodulation (PBM) to traditional dressing of hard-to-heal venous leg ulcers (VLU) reduced healing time, compared to control group from the Swedish registry of ulcer treatment RiksSar.
Method: 34 VLU were treated with infrared 904nm and red 635nm laser PBM twice a week, until healing of the VLU. Tailormade individual control groups were extracted from RiksSar for each of the PBM treated ulcers, a median of 402 control ulcers per PBM ulcer.
Results / Discussion: Healing time of the 34 hard-to-heal VLU in the PBM group was reduced between 66 and 180 days, with a mean of 123 days compared to the control group receiving traditional dressing (p= 0.0001).



Distribution median difference in healing time PBM and control group VLU. Y-axis ; number of intervention group VLU.
X-axis = difference in healing time. number of days.

Summary Statistics

Mean	122.8
Std Dev	120.75
Std Err Mean	20.7
Upper 99% Mean	179.3
Lower 99% Mean	66.2
N	34

Confidence Intervals

Parameter	Estimate	Lower CI	Upper CI	1-Alpha
Mean	122.8	66.1	179.4	0.99
Std Dev	120.76	91.4	174.4	0.99

Conclusion: Regardless of the frailty in the PBM group, compared to control group, healing time of hard-to-heal VLU was significantly shortened, with a mean of 123 days, by adding PBM to traditional dressing. Incorporating PBM into mainstream VLU treatment may significantly change outcomes of treatment. Shortening ulcer duration and promoting healing, including long-term hard-to-heal VLU saving time and resources, for patients and professionals.

The Common H232 STING Allele Shows Impaired Activities in DNA Sensing, Susceptibility to Viral Infection and in Monocyte Cell Function, While the HAQ Variant Possesses Wild-Type Properties

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Abstract

Different innate immune pathways converge to Stimulator of interferon genes (STING) and trigger type I interferon responses after recognition of abnormal nucleic acids in the cells. This non-redundant function renders STING a major player in immunosurveillance, and an emerging target for cancer and infectious diseases therapeutics. Beyond somatic mutations that often occur in cancer, the human gene encoding STING protein, TMEM173 (STING1), holds great genetic heterogeneity; R232, HAQ (R71H-G230A-R293Q) and H232 are the most common alleles. Although some of these alleles are likely to be hypomorphic, their function is still debated, due to the available functional assessments, which have been performed in biased biological systems. Here, by using genetic background-matched models, we report on the functional evaluation of R232, HAQ and H232 variants on STING function, and on how these genotypes affect the susceptibility to clinically relevant viruses, thus supporting a potential contributing cause to differences in inter- individual responses to infections. Our findings also demonstrate a novel toll-like receptor-independent role of STING in modulating monocytic cell function and differentiation into macrophages. We further supported the interplay of STING1 variants and human biology by demonstrating how monocytes bearing the H232 allele were impaired in M1/M2 differentiation, interferon response and antigen presentation. Finally, we assessed the response to PD-1 inhibitor in a small cohort of melanoma patients stratified according to STING genotype. Given the contribution of the STING protein in sensing DNA viruses, bacterial pathogens and misplaced cancer DNA, these data may support the development of novel therapeutic options for infectious diseases and cancer.

Health Advice Published in Estonian Print Media (1930 – 1940): A Healthy Citizen as an Ideal

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Abstract

Background data: In the 1930s Estonia faced several challenges in healthcare:infectious diseases, alcoholism, prostitution and child mortality had to be dealt with. Healers without medical education operated in the villages. Despite that the urban way of life, the glamorous lifestyle of Western Europe gained popularity. People's free time increased, which needed to be filled with activities either at home or outside the home. Therefore, the number of popular magazines aimed at housewives increased.Advice published in magazines provided help in solving, understanding and preventing health problems and promoting a healthy lifestyle. More than 200 magazines were published in Estonia (in 1934, the population of Estonia was 1,126,000).

Aim: The aim of the study is to analyze the health advice in magazines during the Republic of Estonia (1930-1940) in the context of promoting a healthy lifestyle.

Method.420 journal issues were analyzed. An extensive textual analysis was carried out, as well as an evaluation of the photographs and illustrations from the aspect of health counseling.

Results: There was advice in various areas: prevention of infectious and non-infectious diseases and their treatment, first aid, combating sexually transmitted diseases, women's and children's health, mental health, folk medicine techniques, abstinence, healthy eating, hygiene. Advice was offered in both written and visual form. Photos and illustrations helped to empower the message. Folk heritage and health knowledge of the time were relied upon, and a scientific point of view was popularized. The advice contributed to changes in the lifestyle of Estonian citizens and helped to improve quality of life.

Contribution: Health advice is based on knowledge of past heritage and derives from our history and background. Analyzing the past helps create new opportunities for introducing and deepening healthy lifestyles.

Attraction and Retention of Nurses: Issues of Work Organization and Work-Family Balance

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Abstract

There have been many challenges in attracting and retaining various workersin the health sector, and for nurses in particular (Bélanger & Marois, 2015), and this increases labour shortage related to the demographic evolution, and also to retirement of many nurses (Farges & Tremblay, 2016). With the aging of population, we see an increase in demand for health services, which makes the labor shortage even worse. Two main issues have been put forward a few years ago in order to explain the difficulty in attracting and retaining nurses: work organization and Lean Management, in particular job control and work-family balance issues. These issues have led nurses to leave the profession early, as soon as 5 years after graduation, and early retirement is also a challenge.

In some countries, these challenges have led to the adoption of Lean Management, some organizations considering this a solution to increase the work done in the nursing sector. (Tremblay, 2014) Therefore the gap between public income and increase in health costs is increasing, calling for solutions to be found. This is why Lean Management sometimes is introduced in certain organizations (Bouville & Trempe, 2015).

In our paper, we will address these challenges and try to find the elements on which the health sector and hospitals could act in order to increase the number of nurses, and more specifically to attract and retain more. For this, two main issues are addressed in the literature, that is firstly work-life issues and second, work organization, (lean) management and job control. We will present the results of a research we conducted with online questionnaire on these issues, with nurses in Canada (Québec), mainly on issues of work organization and Lean Management, in particular job control and work-family balance issues.

Perspectives on Telenursing: Where are We as a Caribbean Region?

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Abstract

The outbreak of a pandemic globally, has taught us, as a Caribbean people to be innovative and creative in the manner in which we deliver care and services to the consumers of health care. A practice that is often overlooked however, is the use of telenursing in the delivery of quality care and services. Telenursing is the use of technology to coordinate, manage, and deliver nursing services. Noteworthy, is the fact that this technology can revolutionize the manner in which nursing care and services are delivered to communities, especially rural areas, families and patients.

Despite concerns regarding privacy and logistics, the telenursing innovation may be utilized as an alternative strategy for monitoring, education, evaluation of care outcomes, counseling, and consultation *inter alia*. This may be achieved through technologies such as the internet support, mobile/smart phones, phone triage, remote tele-monitoring, interactive video and other technologies.

While barriers such as infrastructure, cost for services and protocol may hinder the practice of telenursing, it has been found to have many advantages among which is reduction in cost to consumers, improved access to quality care by more consumers as well as better monitoring of individuals living with chronic diseases.

There is a dearth of information on the use of telenursing in the Caribbean. The objective of this paper therefore, is to share various perspectives on telenursing and examine its utilization and impact within the Caribbean region.

How to Care Person with Dementia in the Community

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Abstract:

Addressing the issues of aging society is an urgent priority in Japan. Among the most significant themes is the response to dementia. The number of dementia patients aged 65 and older is predicted to reach approximately 6.75 million by 2025, with an estimated prevalence rate of 18.5% if the prevalence rate remains constant across age groups. Additionally, it is evident that "dementia" is the most common cause requiring nursing care among those aged 65 and older. Half of dementia patients in our country live at home, and those living at home are primarily cared by family members. And care provided by spouses accounts for the largest portion at 25.2%, followed by care provided by children at 21.8%.

However, in Japan, there is a widespread consciousness of not wanting to be a burden of family members when considering aging. This consciousness presumably contributes to the decrease in the quality of life of the elderly, as well as creating negative images of illness or aging. Nevertheless, systematic research on this consciousness is not readily apparent from the available literature. Thus far, discussions on care in Japan have beenmainly from the perspective of caregivers, with little focus on the perspective of dementia patients themselves. It is unconfident whether the desires and hopes of the individuals with dementia are reflected in their daily lives - how they wish to be cared for and where/how they want to continue their lives. It is essential to establish systems that allow individuals with MCI or moderate dementia to continue living according to their wishes with maintaining relationships within society, even as their cognitive functions decline. For example, there are cases of individuals who join "dementia cafes" in Asahikawa city finding joy in living within the community while using long-term care insurance services.

The Accuracy of Nurses' Knowledge about the Use of Immunosuppressive Agents in the Treatment of Post-Liver Transplant Patients

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Abstract

Liver disease is a killer of human health, and one effective method for treating and extending the life of end-stage liver disease patients is liver transplantation. Since the introduction of immunesuppressants, the rejection response after organ transplantation has significantly decreased, increasing the five-year survival rate after transplantation. Organ transplant patients must take immunosuppressant drugs for the rest of their lives to reduce the risk of rejection. If patients have insufficient knowledge or understanding of the importance of post-transplant medication, it can lead to transplant failure or even death. Correctly taking immunosuppressant drugs is a key factor in the success of organ transplantation surgery. In clinical practice, nursing staff often encounter transplant patients repeatedly asking questions about the use of immunosuppressants, leading to delays in medication or incorrect dosages. The nursing staff's knowledge of the use of immunosuppressants directly affects patient medication behavior.Upon analysis, it was found that the reasons for the nursing staff's insufficient knowledge of post-liver transplant patients' use of immunosuppressants were:Inconsistent medication concepts among nursing staff.Incomplete preoperative explanations.Patient education materials that do not meet clinical care needs.Lack of post-transplant medication instructions.Therefore, a plan has been developed, including:Developing an in-service education schedule for staff.Creating a preoperative explanation form for organ transplant patients.Producing educational materials on post-transplant medication to help patients understand medication instructions.Creating medication image appearance/form identification cards.After implementing the plan, the quality of care provided by nursing staff to post-liver transplant patients using immunosuppressant therapy has been effectively improved. The nursing staff's correct understanding of post-liver transplant patients' use of immunosuppressant therapy has increased from 77% to 94.8%.

The Effects of Intervention by Multimedia Nursing Instruction on Reducing Anxiety After Voice Reconstruction with Ileocolon Flap

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Abstract

Total laryngectomy results in speech dysfunctions. After voice reconstruction using an ileocolon free autograft, the physiological structure deviates from the normal condition, leading to anxiety. This anxiety can hinder learning ability.

The aim of this study was to investigate the effects of multimedia nursing instruction as an intervention in reducing anxiety for patients in the voice rehabilitation program, compared to conventional nursing instruction sheets.

From 2015 to 2017, a total of 37 patients underwent voice reconstruction with an ileocolon flap following laryngectomy. The patients were divided into two groups: the control group (n=16), which received conventional nursing education sheets, and the experimental group (n=21), which received multimedia nursing instruction. All patients were assessed using the Visual Analogue Scale for Anxiety (VAS-A) before the voice rehabilitation program and were rechecked after each nursing instruction. Nurses' satisfaction was evaluated using a 5-point Likert scale. The VAS-A scores were analyzed using the t-test, and the 5-point results were presented as percentages.

The results showed that the VAS-A score was initially 9.6 (SD±0.6), and significantly decreased to 3.1 (SD±0.8) ($p < .05$) in the experimental group. For the control group, it declined from 9.6 (SD±0.6) to 8.5 (SD±0.5) only. The 5-point Likert scale revealed that 19% rated as excellent, 19.3% as good, 45.8% as fair, and 15.9% as poor with the conventional nursing instruction sheet, whereas 80.5% rated as excellent and 19.5% as good with the multimedia nursing instruction.

In this study, we demonstrated that multimedia nursing instruction significantly reduces patient anxiety and increases the success rate of voice rehabilitation programs.

The Impact of Interventional Timing of Pulmonary Rehabilitation Guidance on the Recovery of Surgical Patients

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Abstract

Pulmonary rehabilitation encompasses various therapeutic methods, including mucus clearance, lung expansion, and improving muscle endurance. Clinical applications of pulmonary rehabilitation have been used in post-surgical patients, and it has been proved to reduce disease symptoms, shorten hospital stays and improve the quality of life. For post-surgical care, interventions such as chest and lung expansion exercises have been employed to reduce fatigue, improve breathing difficulties, aid removal of tubes early , and promote early mobilization, thereby shortening hospital stays. An analysis of the current situation revealed that the delayed timing of post-operative pulmonary rehabilitation interventions due to several reasons: Lack of awareness among primary caregivers about pulmonary rehabilitation guidance. Incomplete preoperative education and explanations. Educational materials is not suitable for person who take care of patient. The absence of standardized pulmonary rehabilitation nursing guidance procedures. Therefore, a post-operative pulmonary rehabilitation care plan has been developed, including:Revision of educational materials. Utilization of educational videos for guidance. Development of standardized post-operative pulmonary rehabilitation guidance procedures. After the implementation of these solutions, the completeness rate of post-operative pulmonary rehabilitation guidance has increased from 70.9% to 93.8%. Through the implementation of the pulmonary rehabilitation care plan, the completeness of guidance for post-surgical patients has been significantly improved, leading to early mobilization, tube removal, and shorter hospital stays, ultimately enhancing the quality of care.

The Application of Visualized Cloud-Based Real-Time Platform in Nursing Management

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Abstract

"Visualized Cloud-based Real-time Ward Platform" is a concept designed for both administrators and frontline nurses, integrating information, visualization, and real-time updates through cloud automation. It aims to reduce repetitive manual tasks, improve work efficiency, and provide managers with early detection and prompt problem-solving through a unified interface that displays retrospective information. We chose Office 365 software as the modified tool.

The production process includes:

1. Analysis: We analyzed the integration and analysis of ward management needs, dividing it into the categories of personnel, events, time, and resources.
2. Forms: We created cloud-based audit questionnaires using forms, allowing exams to be taken anytime, anywhere.
3. Power Apps: We utilized Power Apps for instrument borrowing, shift scheduling, and integrating audit form entry.
4. Power Query: We performed data correlation, calculations, and analysis using Power Query.
5. Power BI: We developed Power BI dashboards, covering four major aspects (nursing manpower, quality audits, education and training, and equipment data).
6. Integration: We converted the dashboard data into a third-party platform.

In the first stage of Power BI implementation, we made adjustments based on user feedback and incorporated internal regulations for continuous monitoring of nursing quality indicators. The platform assists unit managers in ward management through alert signals and automated reminders. By developing this platform, we simplified six nursing steps and integrated twelve ward management items. This led to improvements in education and training completion rates, increased clinical instructor ratios, reduced shift operation time, and shortened data retrieval and quality audit processes. In the second stage, we will design the platform to integrate with care processes, aiming to achieve maximum quality benefits for both caregivers and patients.

The Course and Interrelationship of Symptom Burden and Resilience in Lung Cancer Patients Undergoing Chemotherapy

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Abstract

Purposes: This study aimed to explore the course and interrelationship of symptom burden and resilience in lung cancer patients undergoing chemotherapy.
Methods: A prospective longitudinal research design with a convenience sampling was conducted at a medical centre in Northern Taiwan from September 1, 2021 to August 31, 2022. Symptom burden (M.D. Anderson Symptom Inventory) and resilience (Connor-Davidson Resilience Scale) among the fifteen lung cancer patients with chemotherapy were assessed at 6 time-points: before and 8th day after the chemotherapy from the 1st to 3rd intervention courses.
Results: There were no significant differences for symptom burden between pre- and post- chemotherapy during each of the 3 intervention courses ($p > .05$). The symptom Severity at post- chemotherapy were significantly higher than those at pre chemotherapy ($Z = -2.98$, $p < .05$) during the first chemotherapy course. Fatigue was the most common symptom during the first three chemotherapy courses. Symptom inference varied along with the 3 intervention courses. The results of GEE demonstrated no significant differences for the symptom burden at the first, Second and third chemotherapy course compared with before chemotherapy.
There were no significant differences for the resilience between pre- and post- chemotherapy during each of the 3 intervention courses ($p > .05$).
The " trust in one's instincts, tolerance of negative effect, and strengthening effects of stress " subscale of resilience at post chemotherapy were significantly higher than those at pre chemotherapy during the third course ($Z = -2.11$, $p < .05$).The results of GEE demonstrated no significant differences for the total scores of resilience at the first, Second and third chemotherapy course compared with before chemotherapy.
symptom burden was significantly negatively correlated with resilience($r = -0.57 \sim -0.80$, $p < .05$) at the 6 time-points except at prior to 2nd chemotherapy ($r = -0.46$, $p > .05$). A higher symptom burden correlated with a lower resilience.
Conclusion: This study shows that a higher symptom burden correlates with a lower resilience. Suggestions proposed are as followings: Enhancing the assessment of the changes of cancer patient's symptom burden and resilience during the chemotherapy period; Providing patient-centered symptom management care and instructing the patients the knowledge and skills for Self- symptom management to alleviate the discomfort caused by the illness and the adverse effects of chemotherapy; and Provide timely counseling to promote the patients' resilience to help them smoothly pass through the courses of chemotherapy.

An Innovative Game-Based Learning Approach to Improve the Performance of Ward Nurses during Cardiopulmonary Resuscitation

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Abstract

In recent years, Game-Based learning (GBL) has been widely adopted in the domain of medical education. The rationale is to revolutionize traditional classroom teaching and the element of fun keeps students engaged and focused, thereby enhancing the learning outcomes (Lockey et al., 2018). Cardiopulmonary Resuscitation (CPR) is a technique employed to rescue patients undergoing cardiac arrest until they regain spontaneous circulation. Since such scenarios are commonplace in the hospital, the responders' experience and self-confidence play a pivotal role in their performance (Rajeswaran et al., 2018).

<Motive>
In February 2022, our unit encountered two cases of medication errors during CPR. Though the errors were promptly identified and rectified, physicians raised concerns with regards to inexperienced nurses being disorganized, inefficient and even incompetent during resuscitation, potentially posing threat to patient safety. As such, a task force was established to address this issue.

<Activities and processes>
An innovative GBL strategy was utilized to improve the capability of our NPGY during resuscitation. In conjunction with lectures, we designed quizzes, roleplay simulations and escape rooms, using Blooket software, Poker cards and flashcards. Through the "learning through play" approach, we sought to enhance students' motivation to learn, bolster their self-confidence, nurture critical thinking and creativity, in order to achieve better learning outcomes.

<Promoting the strategy>
Since CPR may occur anywhere in the hospital, we standardized the GBL procedures before promoting it to other internal medicine wards that share similar patient demographics. We hope that our experience with the GBL model can help nurses improve competency and build confidence during resuscitation.

Chronic Pain in Older Adults in Long-term Care Facilities

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Abstract

Introduction: Chronic pain in older people staying in long-term care facilities is of particular importance not only because of its negative subjective experience but, above all, because of its consequences. The consequence of pain is that the ability to perform activities of daily living is limited or altogether prevented, which in turn leads to a greater dependency on care.
Aim: The aim of this study was to assess the relationship between chronic pain and dependency on care
Material and methods: The study was conducted among 226 people over 60 years of age staying in a long-term care facility in Poland. The study used a survey questionnaire containing questions on demographic and social characteristics, the Geriatric Pain Measure - 24 (GPM-24), as well as the Care Dependency Scale (CDS).
Results: The percentage of surveyed women was higher compared to the percentage of surveyed men (64% vs. 36%). The mean age in the group was 78.44 (±SD 9.06). Mild pain (GPM-24, <30 points) was reported by 155 people (68.6%), moderate pain (30-69 points) was reported by 71 people (31.4%). In the study group, no one reported severe pain (>70 points). A high level of care dependence (CDS, 15-44 points) was found in 99 respondents (43.8%), medium (45-59 points) in 87 people (38.5%), and low (60-75 points) in 40 people (17.7%). The correlation analysis of the Pearson r coefficient (R2) between pain and dependence on care in older people staying in long-term care facilities showed a negative correlation in the group between: withdrawal due to pain (R2=-0.48; p<0.001), pain intensity (R2=-0.17; p=0.010), pain associated with walking (R2=-0.31; p<0.001), pain resulting from exercise (R2=-0.39; p<0.001) and other activities (R2=-0.36; p<0.001) as well as total pain score and dependence on care (R2=-0.46; p<0.001 as pain intensity increases, dependence on care increases).
Conclusions: The study shows a strong link between pain and care dependency in older adults living in long-term care facilities. Multidisciplinary assessment of older adults in a long-term care facility is critical to both reducing pain and increasing independence from care.
Keywords: pain, care dependency, long-term care, older people.

Investigation of the Role of the Endoplasmic Reticulum Chaperones GRP78 and GRP94 in the Regulation of Different Hallmarks of Cancer in Lung Adenocarcinoma and Breast Cancer Cells

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Abstract

The glucose regulated proteins GRP78 and GRP94 are endoplasmic reticulum (ER) proteins with chaperone activity playing important roles in folding and assembly of de novo synthesized proteins. In cells undergoing ER stress GRP78 and GRP94 translocateto the cell surface where they regulate metastasis and immune response signaling. Given their role in immunity this study hypothesized that cell surface GRP78 and GRP94 differentially modulate breast versus lung tumor microenvironment via their interaction with the immune checkpoint proteins programmed death ligand-1 (PD-L1) and human leucocytes antigen G (HLA-G). To explore this hypothesis the PD-L1 and HLA-G expression was followed in lung adenocarcinoma A549 and breast cancer MCF-7 cells in which the cell surface expression of GRP78 and GRP94 was either induced following tunicamycin or thapsigargin treatment or silenced by siRNA transfection. GRP94 was upregulated in GRP78 silenced A549 and MCF-7 cells and vice versa. GRP78 and GRP94 negatively associated with PD-L1 levels in A549 and MCF-7 cells treated with thapsigargin but positively correlated with PD-L1 levels in tunicamycin treated cells. Low GRP78 or GRP94 protein levels associated with increased HLA-G levels in A549 and MCF-7 cells treated with either one of the ER stress inducers. Reduced migratory potential was observed in silenced A549 cells, while increased migration was seen in silenced MCF-7 cells. High levels of GRP78 correlate with shorter overall survival of breast cancer patients, whereas in lung adenocarcinoma patients high GRP78 levels correlate with longer overall survival which could be potentially explained by differential infiltration of immune cells in breast cancer versus lung adenocarcinoma tumor microenvironment. Altogether results presented in this study indicate that GRP78 and GRP94 by regulating the levels of the PD-L1 and HLA-G immune checkpoint proteins differentially affect OS of breast versus lung cancer patients.

Ways of Implementing Practical Activities for Nursing Students in a Medical Simulation Center

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Abstract

Introduction: Medical simulation centers are standard of teaching in every medical school these days. A well-equipped simulation center and a dedicated staff are successful in the implementation of the curriculum. Nursing is a special field of study, as the knowledge
and skills that each student must acquire is very broad. From theoretical knowledge, technicalskills, physical examination, to the ability to communicate with patients and in a team. Medical simulation centers provide the opportunity to accomplish all these tasks.
Methods: The WSEI Academy's Monoprofile Medical Simulation Center has developed an instructional program for all types of practical classes for nursing students. The program includes topics for the following classes, scenarios to be carried out, technical skills, evaluation of the patient's condition in a given case, and a case study for practicing nursing diagnosis skills.
Results: Classesareconductedat a specifictime in threegroups, by threeteachers. One teacher implements the scenarios, the second practices the scenarios with another group and the third works with another group with a casestudy – teaching how to make nursing diagnoses. All three types of classes revolve around one selected topic such as: "emergencies in surgery", or "diabetes", etc. Students work 10 hours rotating at equal intervals between teachers, so that a given topic of the day is covered in different ways.
Conclusions:The developed program successfully allows the implementation of selected topics
from a given clinic in a way that firmly consolidates both information and skills and behaviors. Students are more willing to take on more difficult tasks on the wards during their professional practice. The skills of our Academy's students are noticed by employers.