Title: Impact of a physical activity program on the health-related quality of life in pediatric cancer patients: a study protocol.

PubMed ID: 40636890

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Abstract: Physical activity is essential for the health and well-being of children and adolescents. However, those living with cancer often experience reduced physical activity levels, which negatively impact their functional capacity and health-related quality of life (HRQoL). In Ecuador, data from the National Institute of Statistics and Census (2021) reveal that 20% of children engage in less than one hour of physical activity per week, highlighting the need for targeted interventions. While previous studies demonstrate that supervised exercise programs can improve physical and psychosocial health outcomes in pediatric oncology patients, no evidence exists from Ecuador to assess the effects of such programs. This study will examine the impact of a structured physical activity program on the HRQoL of pediatric cancer patients in Quito, Ecuador. Using a case-control design, 90 participants will be randomized into two groups: an intervention group receiving a 10-week, supervised physical activity program and a control group with no exercise intervention and standard care, with additional follow-up if deemed necessary by the social worker. HRQoL surveys using a standardized instrument will be administered to all participants (those in the intervention group and those in the control group) at baseline, post intervention, and follow-up to assess changes over time. This research will address a critical public health gap by exploring how physical activity can mitigate the adverse effects of cancer treatment, improve physical and emotional health, and enhance the HRQoL in pediatric oncology patients. Findings will contribute valuable insights for integrating physical activity into pediatric oncology care in low- and middle-income countries.

Title: Fluorescence Anisotropy for Detailed Analysis of Doxorubicin Loading into DNA Origami Nanocarriers for Drug Delivery.

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Authors: Ekaterina S Lisitsyna, Anna Klose, Elina Vuorimaa-Laukkanen, Heini Ijäs, Tatu Lajunen, Klaus Suhling, Veikko Linko, Timo Laaksonen

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Abstract: Owing to doxorubicin's high DNA binding affinity, doxorubicin-loaded DNA origami nanostructures (DOX-DONs) are promising nanocarriers against cancer. However, understanding the interactions between doxorubicin (DOX) and DNA origami nanostructures (DONs) is important to ensure the quality of DOX-DONs. This interaction is often taken for granted and the influence of DOX loading conditions is poorly characterized. Exploiting the inherent fluorescence of DOX, steady-state and time-resolved fluorescence anisotropy spectroscopy techniques are used for characterizing nondestructively the binding between DOX and DONs, and the purity of the formed complexes. The difference in fluorescence anisotropy between free DOX and DOX-DONs confirms the DOX-DON complex formation. Further, at loading ratios of DOX to DNA base pairs >0.5, homo-Förster resonance energy transfer (homo-FRET) between closely packed DOX molecules is observed. Moreover, time-resolved anisotropy reveals DOX aggregation on DONs at high loading ratios >1. For loading ratios >0.1, spin-filtration to remove excess free DOX is efficient and necessary, though at loading ratios >1 some DOX aggregates remain attached to the DONs. In summary, fluorescence anisotropy analysis provides more detailed information and insight into DOX-DONs compared to the regularly used fluorescence intensity-based characterization methods, and these results can help designing more efficient and safer DNA intercalator-based nanocarriers.

Title: Identifying emphysema risk using brominated flame retardants exposure: a machine learning predictive model based on the SHAP methodology.

Authors: Qihang Xie, Haoran Qu, Jianfeng Li, Rui Zeng, Wenhao Li, Rui Ouyang, Chengxiang Zhang, Siyu Xie, Ming Du

Publication Date: 2025

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Abstract: Emphysema is a major contributor to lung disease progression and is associated with significant health risks, including exacerbations, mortality, and lung cancer. While environmental exposures, such as brominated flame retardants (BFRs), have been suggested as risk factors, their role in emphysema prediction has been largely overlooked. This study aimed to develop a machine learning (ML) model to predict emphysema risk incorporating BFRs exposure data and demographic characteristics.

Title: Risk factors of neuroblastoma: a systematic review and meta-analysis.

Authors: Felix M Onyije, Roya Dolatkhah, Ann Olsson, Liacine Bouaoun, Joachim Schüz

Publication Date: 2025

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Abstract: Neuroblastoma (NB) is the most common extracranial tumor in children. Synthesizing and elucidating modifiable risk factors is fundamental to inform primary prevention of NB. The objective is to review literature and synthesize risk factors for NB.

Title: EuroQoL-Visual Analog Scale as a Tool for Assessing Health Status in Breast Cancer Patients: A Cross-sectional Study.

Authors: Richha Prabhakar, Rajat Prabhakar, Dharmapuri R Rao

Publication Date: 2025

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Abstract: Breast cancer significantly influences women's health and overall well-being, necessitating comprehensive assessments to guide effective supportive care during cancer treatment. This study utilizes the EuroQoL-Visual Analog Scale (EQ-VAS) to systematically evaluate the health status and quality of life in women undergoing treatment for breast cancer.