



**Nutrition
Informatics**

SMAART Hub for Informatics enabled Nutrition Education (SHINE™)

Research, Innovate, Policy, Practice, Entrepreneurship

Welcome Message

Welcome to the 18th issue of the Nutrition Informatics newsletter SHINE (June 2023) of the Foundation of Healthcare Technologies Society. This newsletter aims to bring together the advancements in the field of Nutrition Informatics Research, Innovation, Policy, Practice, and Entrepreneurship. The newsletter will also provide recent updates about the various national and International nutrition informatics projects, and highlight some of the major nutritional challenges that can potentially be solved through various nutrition informatics interventions using data, information, and knowledge frameworks. We also highlight some of the student successes in the field of nutrition informatics research and practice. In addition, we bring together stories of the student's learning experience with the real nutrition informatics projects addressing real public health challenges. I encourage you to make a meaningful contribution to this newsletter by sharing data-driven, evidence-based ideas, innovations, and interventions that aim to address nutritional challenges impacting health among individuals, families, and communities across diverse Indian settings.



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THE BENEFITS OF USING MACHINE LEARNING IN NUTRITION RESEARCH AND ANALYSIS

As the field of nutrition advances, the data it produces is becoming more intricate and multifaceted, necessitating novel methods for analysis. Malnutrition is the root cause of an increasing number of chronic illnesses that have multiple causes, leading to the generation of intricate data sets. However, with recent advances in technology and coding, Machine Learning (ML), a subfield of Artificial Intelligence (AI), can be a valuable tool for tackling these types of complex analyses. The properties of ML make it a more feasible alternative to traditional methods of handling such data.

What is Machine Learning?

The field of machine learning (ML) in AI deals with algorithms. Mathematical models for decision-making could be produced by ML algorithms. Without any programming, these models are built using sizable training data sets. In the latter decade of the 20th century, search engine applications helped make the use of ML algorithms more widely accepted. With the introduction of more sophisticated ML algorithms in the following decades, there were high hopes for substantial breakthroughs in organic synthesis. There is evidence that suggests machine learning is the future in the field of digital diagnosis and biomedical research.

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**NUTRITION
RESEARCH IN
GLOBAL SETTINGS**



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TECHNOLOGY, TRANSPORT, GLOBALIZATION AND THE NUTRITION TRANSITION FOOD POLICY

The rapid advancements in technology have led to changes in people's diet and physical activity worldwide. These changes have reduced energy expenditure during leisure, transportation, and work. Additionally, the globalized modern food processing, marketing, and distribution techniques, along with the influence of mass media, have further impacted people's dietary habits. Interestingly, the increase in obesity is now more prevalent in rural areas across all continents, with the burden disproportionately affecting the poor.

While it is difficult to establish direct connections between globalization and diet/activity, there is a compelling argument that globalization plays a significant role as an underlying force in the current phase of the nutrition transition.

Source : <https://www.sciencedirect.com/>

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REVIEW AND EVALUATION OF INNOVATIVE TECHNOLOGIES FOR MEASURING DIET IN NUTRITIONAL EPIDEMIOLOGY

This article discusses the use of innovative technologies for dietary assessment in nutritional epidemiological studies. The objective is to evaluate the strengths and weaknesses of these technologies compared to conventional methodologies such as Food Frequency Questionnaires, food records, and 24-hour dietary recalls. The study identifies six main groups of innovative technologies, including Personal Digital Assistant, mobile phone, interactive computer, web-based, camera and tape-recorder, and scan and sensor-based technologies. While some of these technologies improve the recording of dietary intake, their validity in estimating individual intakes is generally low to moderate. The accuracy of fully automated approaches in 24-hour dietary recalls is still limited, and methodological issues, such as self-reported portion sizes, pose challenges. Web-based and paper-based Food Frequency Questionnaires have similar measurement errors. The integration of these technologies in epidemiological studies should consider study objectives, target population, and available resources. However, self-reporting biases in dietary intake will still exist, and further research is needed to validate innovative dietary assessment technologies.

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E-HEALTH TECHNOLOGIES TO SUPPORT NUTRITION AND PHYSICAL ACTIVITY BEHAVIORS IN DIABETES SELF-MANAGEMENT

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Diabetes is a complex and chronic condition that requires individuals to possess adequate knowledge and self-management skills to effectively control blood sugar levels and improve health outcomes. Proper management includes paying attention to dietary intake and engaging in physical activity, both of which necessitate personalized education and support. Electronic health (eHealth) technologies have demonstrated their potential in assisting individuals with diabetes self-management (DSM) behaviors. This review presents various examples of technologies used to support nutrition and physical activity in the context of DSM.

These technologies encompass commonly used tools like web-based programs and mobile phone applications, as well as emerging tools such as virtual and augmented reality, video games, computer vision for monitoring dietary carbohydrate intake, and wearable devices. The review discusses the challenges and facilitators associated with the utilization of eHealth technologies in DSM and provides strategies for implementing these technologies in practice. Additionally, suggestions for future research to enhance nutrition and physical activity behaviors as integral components of comprehensive DSM are offered.



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