A New Approach for Machine Learning Algorithm to Generate Automated Diet Plan for Indian Children Age 2 To 12 Years

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Learning Outcome: Upon completion participants will be able to see an autogenated diet plan with specifics of region, cuisine, age and RDA for macronutrients and selected micronutrients

Background: Machine Learning Algorithm (MLA) is a type of Artificial Intelligence (AI) that provide impactful computer systems which precisely describe, determine, and achieve algorithms.

Methods: Nutrition Expert Prototype System for children (age 2-10 years) was developed. Coding languages used for developing the application were - Ruby on Rails¹, Cordova², AngularJS³, HTML⁴ and CSS. The nutrient values of the ingredients for creating recipes were obtained from NIN 2020, IFCT 2017, USDA. With the help of SAAS (Software As A Service), standardized recipes consumed by Indian population, nutrient values of medical supplements, sports supplements, ready to eat food and packed foods were also added. A set of 250 diet plans were manually created according to the age, weight, height and region of the child and focusing on 8 main nutrients (Energy, Carbohydrates, Protein, Fats, Iron, Calcium, Fibre, Omega 3). A unique algorithm was formed to calculate and create a mix of auto-generated 7-day diet plans as per the child’s RDA. This prototype was validated by a team of 30 nutritionists.

Result: It was found that our prototype achieved approximately 80% of all the 8 nutrients which can provide predictive and precise nutrition plan for children between 2 to 10 years.

Conclusion: Thus, the use of MLA to generate accurate and personalised nutrient and diet recommendations for better health and well-being seem to be a promising new approach in the formation of an integrated framework.

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A Stages of Change Algorithm for Dietetics Practice: A Criterion Validity Study

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Learning Outcome: Describe the process for validating an algorithm to assess stages of change to follow a healthy eating pattern.

An integral component of nutrition counseling is the comprehensive nutrition assessment. While the Academy recommends assessing stages of change as a component of the nutrition assessment, there is not a universal method used among dietetics professionals. Currently, the majority of professionals are using open-ended questions. Dietary stages of change assessment can be challenging due to the complexity of human behaviors. The purpose of this study was to develop and assess the content and criterion validity of an algorithm to assess stages of change to follow a healthy eating pattern. Central TX adults were recruited for this study. A 5-item algorithm was developed and administered by phone to classify participants based on Prochaska's constructs, followed by participants completing a web-based FFQ with HEI-2015 scores as the external criterion. Data were analyzed using SPSS (ver. 26). Descriptive statistics and a polynomial regression were performed on the data. A total of 100 adults provided consent. Participants were classified in the maintenance (30%), action (21%), preparation (20%), contemplation (15%), or precontemplation (14%) stage. Mean total HEI-2015 scores among participants was 70.12±9.79. Mean HEI-2015 scores increased linearly from contemplation to maintenance. Polynomial regression revealed a weak correlation between stages of change and total HEI-2015 scores (R = 0.25). Findings from this study suggest total HEI-2015 scores are an acceptable external criterion for dietary stages of change. Despite a weak correlation between variables, evidence from this study is promising. Further research is needed to refine the staging algorithm, to limit the misclassification of maintainers as precontemplators.

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A Survey of Program Directors of Graduate Programs Following the Future Education Model Accreditation Standards

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Learning Outcome: Describe the most significant benefit and challenges in developing graduate demonstration program following the Future Education Model Accreditation Standards identified by program directors.

Demonstration programs that have adopted the Future Education Model (FEM) Accreditation Standards use competency-based education (CBE) in an integrated approach to prepare students with the knowledge and skills needed for the nutrition and dietetics professions. Directors of 20 newly accredited graduate demonstration programs (FG programs) were surveyed in Fall 2020. Half of the FG programs (10/20, 50%) were planning to enroll their first cohort of students in 2021. The other 10 FG programs had a total of 130 students actively enrolled, of whom more than 40% (56/130, 43.1%) did not hold a Didactic Program in Dietetics (DPD) verification statement prior to enrollment. Consistent with survey data collected in 2019, FG program directors identified CBE as the most significant benefit for implementing the FEM Standards for reasons including being a leader in the field, advancing dietetic education with the "advanced competencies", streamlining the curriculum, meeting the profession's needs with more opportunities for experiential learning, and removing the barrier of the dietetic internship match. The significant time invested to develop an FG program was identified as the biggest challenge, followed by lack of understanding of CBE and of FEM among DPD students and FG program preceptors. These results indicate that the FG programs promise to enhance the preparation to become a registered dietitian nutritionist and suggest the need for increased communication and training on CBE and FEM among undergraduate nutrition students and potential preceptors.

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"It Must Go Beyond Dieting": A Qualitative Study on Designing mHealth Weight Management Programs for African American Women

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Learning Outcome: List key components in designing a mHealth weight management program for African American women

Background: The high rate of obesity, ownership of smartphones, online search for nutrition/dieting information among African American women (AAW) provide a unique opportunity to develop cost-effective, accessible, and acceptable mHealth weight management programs for them. Furthermore, they should participate in the development and evaluation of these programs.

Purpose: To explore ideal components of a culturally relevant mHealth weight management program for AAW, and to examine how these components may vary by age group. Methods. Twelve focus group triads (FG) were conducted with AAW (n=36) in north-central Florida. Participants were smartphone owners who expressed a desire to lose weight. The framework method was used to manage, organize, synthesize, and analyze data themes by gender and age group—18-29 (young), 30-50 (middle-age), and 51+ (older).

Results: Based on BMI, young women were overweight (26.23±6.7), middle-aged women were obese (30.72±8.31), and older women were obese (31.03±5.67). Most (70%) searched online for dieting information within the past 12 months. Five overarching themes for designing mHealth weight management programs were identified: 1) holistic program that goes beyond dieting; 2) social media integration for support and sense of community; 3) self-monitoring app; 4) programs of varying lengths and meaningful incentives, and 5) two-way text messaging.

Conclusion: AAW were receptive to mHealth weight management programs, which may be appealing during and after the COVID-19 pandemic. Holistic programs of four to six weeks that addressed stress eating, had a social media component, and a few educational texts per week may be appealing to AAW.

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