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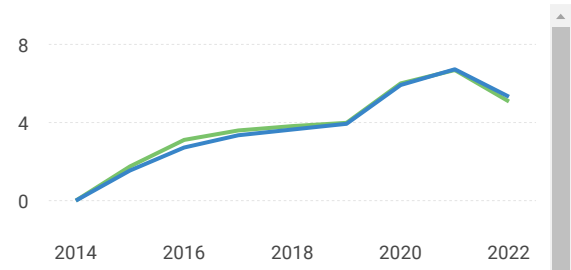
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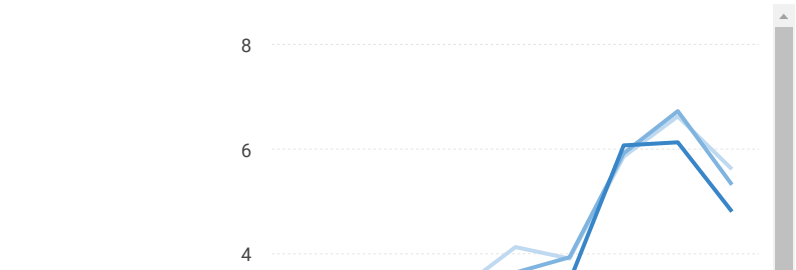
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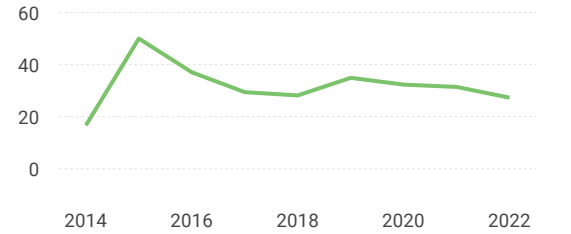


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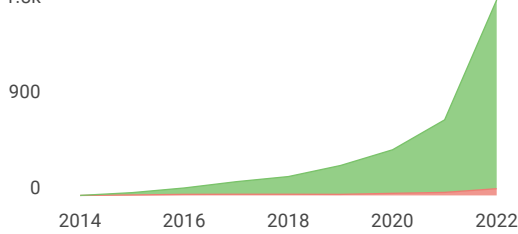
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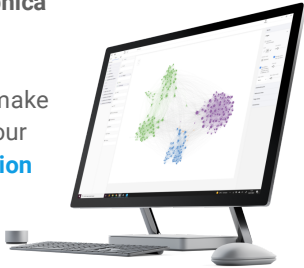
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Dietary patterns derived using principal component analysis and associations with sociodemographic characteristics and overweight and obesity: A cross-sectional analysis of Iranian adults

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Introduction: This study examined the cross-sectional association between household dietary patterns and sociodemographic characteristics and BMI in a nationally representative sample of Iranian adults.

Methods: Data on 6,833 households ($n = 17,824$ adults) from the National Comprehensive Study on Household Food Consumption Pattern and Nutritional Status 2001–2003 were used. Principal component analysis (PCA) was used to extract dietary patterns from three household 24-h dietary recalls. Linear regression analyses were used to examine associations between dietary patterns and sociodemographic characteristics and BMI.

Results: Three dietary patterns were identified: the first was characterized by high citrus fruit intake, the second by high hydrogenated fats intake and the third by high non-leafy vegetables intake. The first and third patterns were associated with household heads with higher education and living in urban areas, while the second was associated with household heads with lower education and living in rural areas. All dietary patterns were positively associated with BMI. The strongest association was found with the first dietary pattern (β : 0.49, 95% CI: 0.43, 0.55).

Discussion: While all three dietary patterns were positively associated with BMI, the sociodemographic characteristics of Iranian adults who consumed them differed. These findings inform the design of population-level dietary interventions to address rising obesity rates in Iran.

KEYWORDS

dietary patterns, principal component analysis, obesity, Iranians, adults



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The association between oxidative balance score and periodontitis in adults: a population-based study

Haitao Qu*

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Introduction: The pathogenesis between oxidative stress and periodontitis was correlated. The Oxidative Balance Score (OBS) is a systematic tool to assess the effects of diet and lifestyle in relation to oxidative stress. However, the association between OBS and periodontitis has not been reported previously.

Methods: Sixteen dietary factors and four lifestyle factors were selected to score the OBS. Multivariate logistic regression and sensitivity analysis were used to investigate the relationship between OBS and periodontitis based on data from the National Health and Nutrition Examination Survey (NHANES) 1999–2018. Subgroup analysis and interaction tests were used to investigate whether this association was stable across populations.

Results: This study included 3,706 participants. There was a negative linear association between OBS and periodontitis in all participants [0.89 (0.80, 0.97)], and after converting OBS to a quartile variable, participants with OBS in the highest quartile had a 29% lower risk of periodontitis than those with OBS in the lowest quartile [0.71 (0.42, 0.98)]. This negative association differed with respect to age and diabetes.

Conclusion: There is a negative association between OBS and periodontitis in US adults. Our results suggest that OBS may be used as a biomarker for measuring periodontitis.

KEYWORDS

Oxidative Balance Score (OBS), periodontitis, oxidative stress, NHANES, antioxidants

1. Introduction

Periodontitis is a common inflammatory disease of the oral cavity (1, 2), with the majority of cases occurring in people aged 55–59 years old (3), which is an important cause of tooth loss in adults (4). Plaque biofilm initiates the process, influencing the host's immunological function and inflammatory response (5, 6). Bacterial and their metabolite-produced inflammatory mediators cause immunological dysfunction and periodontal tissue

Abbreviations: OBS, Oxidative Balance Score; NHANES, National Health and Nutrition Examination Survey; NCHS, National Center for Health Statistics; AAP, Academy of Periodontology; AL, attachment loss; PD, pocket depth; LDL-C, low-density lipoprotein cholesterol; PIR, income-to-poverty ratio; CKD, chronic kidney disease.



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Evaluation of nutritional status and clinical depression classification using an explainable machine learning method

Payam Hosseinzadeh Kasani^{1,2}, Jung Eun Lee², Chihyun Park^{2,3},
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Introduction: Depression is a prevalent disorder worldwide, with potentially severe implications. It contributes significantly to an increased risk of diseases associated with multiple risk factors. Early accurate diagnosis of depressive symptoms is a critical first step toward management, intervention, and prevention. Various nutritional and dietary compounds have been suggested to be involved in the onset, maintenance, and severity of depressive disorders. Despite the challenges to better understanding the association between nutritional risk factors and the occurrence of depression, assessing the interplay of these markers through supervised machine learning remains to be fully explored.

Methods: This study aimed to determine the ability of machine learning-based decision support methods to identify the presence of depression using publicly available health data from the Korean National Health and Nutrition Examination Survey. Two exploration techniques, namely, uniform manifold approximation and projection and Pearson correlation, were performed for explanatory analysis among datasets. A grid search optimization with cross-validation was performed to fine-tune the models for classifying depression with the highest accuracy. Several performance measures, including accuracy, precision, recall, F1 score, confusion matrix, areas under the precision-recall and receiver operating characteristic curves, and calibration plot, were used to compare classifier performances. We further investigated the importance of the features provided: visualized interpretation using ELI5, partial dependence plots, and local interpretable using model-agnostic explanations and Shapley additive explanation for the prediction at both the population and individual levels.

Results: The best model achieved an accuracy of 86.18% for XGBoost and an area under the curve of 84.96% for the random forest model in original dataset and the XGBoost algorithm with an accuracy of 86.02% and an area under the curve of 85.34% in the quantile-based dataset. The explainable results revealed a complementary observation of the relative changes in feature values, and, thus, the importance of emergent depression risks could be identified.

Discussion: The strength of our approach is the large sample size used for training with a fine-tuned model. The machine learning-based analysis showed that the hyper-tuned model has empirically higher accuracy in classifying patients with depressive disorder, as evidenced by the set of interpretable experiments, and can be an effective solution for disease control.

KEYWORDS

depression, nutrition, machine learning, classification, interpretability, clinical depression



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