

USE OF ARTIFICIAL INTELLIGENCE IN SCREENING THE RISK OF DEPRESSION IN NON-COMMUNICABLE CHRONIC DISEASES: A NARRATIVE LITERATURE REVIEW

Bianca Fonseca Repetti

Laura Mendes Abib da Silva - 1. Medical Student at the University of Marília (UNIMAR); Marília; São Paulo; Brazil; João Baptista Cardia Neto - 2. Professor of the Multiplatform Software Development course at Fatec Marília; Marília; São Paulo; Brazil; Karina Quesada - 3. Professor at the University of Marília (UNIMAR). Doctoral student in the Interdisciplinary Health Program at the University of Marília (UNIMAR); Marília; São Paulo; Brazil

RESUMO

Global population aging, driven by declining fertility rates and increased life expectancy, has contributed to the growing prevalence of non-communicable chronic diseases (NCDs). In this context, depression among older adults is a frequent disorder, associated with adverse outcomes, including functional disability, poorer clinical prognosis, increased mortality, and rising healthcare costs. The coexistence of depression and NCDs results in complex patterns of multimorbidity, making the development of effective strategies for early identification of at-risk individuals essential. This study aims to analyze the use of artificial intelligence (AI) models in predicting and screening the risk of depression in patients with NCDs. This is a narrative literature review guided by the SANRA (Scale for the Assessment of Narrative Review Articles) criteria, including studies published between 2018 and 2025, indexed in the PubMed and ScienceDirect databases. The search strategy used the terms: ("machine learning" OR "artificial intelligence") AND depression AND "risk prediction". Original articles, observational studies, longitudinal studies, and systematic reviews investigating the use of AI in predicting depression in individuals with NCDs were included, while studies not addressing NCDs or AI methods were excluded. A total of 12 articles were selected, with qualitative analysis of the main predictors and models used. The analyzed studies demonstrate that AI models show satisfactory performance in predicting depression in patients with NCDs. The main predictors identified include factors related to physical health (self-perception, bodily pain, and functional limitations in activities of daily living), cognitive aspects, behavioral variables (sleep duration, smoking, and alcohol consumption), and psychosocial factors (life satisfaction and socioeconomic conditions), highlighting the multifactorial nature of the outcome and contributing to the discriminative capacity of the models. In an analytical observational study with 3,959 participants aged 60 years or older, the prevalence of depression was 19.2%, approximately twice as high in females. These findings correspond to the characterization of the sample and the definition of the outcome, forming the basis for the development of predictive screening models. Based on these data, algorithms such as logistic regression, Random Forest, Support Vector Machine, k-Nearest Neighbors, and AdaBoost were applied, showing high performance. Random Forest combined with the SMOTE (Synthetic Minority Oversampling Technique) balancing method stood out, demonstrating excellent discriminative ability (AUROC ~0.95; AUPRC 0.920; accuracy 0.891; sensitivity 0.875). In contrast, another study with 7,121 participants identified a prevalence of 21.5% and better performance with logistic regression combined with SMOTE (LR-SM), although with more moderate metrics (AUROC 0.612; AUPRC 0.468; accuracy 0.619; sensitivity 0.546), yet consistent in external validation, highlighting the influence of sample and methodological differences on results. In summary, risk prediction models demonstrate satisfactory performance in identifying depression among older adults with NCDs, indicating their potential as screening tools. However, limitations such as the use of self-reported data, class imbalance, and the scarcity of external validation still restrict their generalizability, requiring future studies with greater standardization.

Palavras-chave: Artificial Intelligence; Screening; Depression; Non- Communicable Chronic Diseases.