Predicting Stress-Induced Somatic Symptoms from Personality and Behavioral Indicators Using Machine Learning

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1. Round 1

1.1. Reviewer 1

Reviewer:

The methodological section is generally solid, with a relatively large community sample, validated measures (PHQ-15, Big Five inventory), and a transparent description of preprocessing and model comparison; however, the description of the sampling strategy, recruitment channels, and potential selection biases in this Brazilian online sample is too brief, and more detail is needed to assess external validity and potential limits to generalizability.

The paper makes several clinically and practically relevant claims about the potential use of these models to identify high-risk individuals and inform prevention or intervention, but these implications are somewhat speculative given the cross-sectional, self-report design; the authors should explicitly acknowledge this limitation, avoid causal language, and more carefully delimit what kinds of "prediction" (short-term estimation vs. prospective risk) are supported by the data.

The construct validity of "stress-induced somatic symptoms" as operationalized by the PHQ-15 should be discussed in more depth, including consideration of its overlap with general distress and functional somatic syndromes, potential cultural

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particularities in Brazilian populations, and whether any sensitivity analyses (e.g., excluding items most strongly confounded with depression/anxiety) were performed to ensure robustness of the results.

The manuscript is overall well written and coherent, but it would benefit from stylistic tightening and structural refinement: some paragraphs in the introduction and discussion are excessively long and citation-dense, obscuring the core argument; organizing the discussion around a small set of clearly labeled subthemes (e.g., "Personality as a vulnerability factor," "Behavioral indicators as modifiable targets," "Methodological and machine-learning considerations," "Limitations and future directions") would improve readability.

Authors revised the manuscript and uploaded the document.

1.2.   Reviewer 2

Reviewer:

The machine-learning pipeline (train-test split, k-fold cross-validation, multiple algorithms, and performance metrics) is appropriate, but the paper should provide more information on model tuning and complexity control (e.g., hyperparameter search strategy, criteria for stopping, prevention of overfitting in XGBoost and Random Forest), as well as explicitly report the chosen k in cross-validation and any nested CV procedures, if used.

The presentation of results would be strengthened by a more systematic reporting of effect sizes and confidence intervals alongside R^2, MAE, and RMSE, and by clearer comparison to a simple, interpretable baseline (e.g., mean predictor or standard linear regression) so that the incremental predictive gain of the more complex models is quantitatively evident and not only described in relative terms.

The use of SHAP values for interpretability is a notable strength, but the manuscript currently underutilizes this tool: the authors should more explicitly rank features by importance, provide graphical SHAP summaries (e.g., beeswarm or bar plots), and discuss any non-linear or interaction effects that emerge, linking these back to theory on neuroticism, conscientiousness, sleep, and physical activity.

While the findings that neuroticism predicts higher somatic symptoms and that conscientiousness, extraversion, sleep, and physical activity are protective are consistent with existing literature, the discussion tends to reiterate known associations rather than fully exploiting the predictive and multivariate nature of the ML approach; the authors should emphasize what the ML analysis reveals that standard regression could not, and clarify whether any unexpected or counterintuitive patterns emerged.

Authors revised the manuscript and uploaded the document.

2.   Revised

Editor's decision: Accepted.
Editor in Chief's decision: Accepted.