




XGBoost Prediction of Eating Disorder Symptom Severity among Adolescent Girls Using Body Dissatisfaction, Social Comparison, Self-Esteem, and Instagram Use Patterns

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R e v i e w e r s

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1. Round 1

1.1. Reviewer 1

Reviewer:

In the introductory paragraph beginning with “Eating disorders represent a significant public health concern,” the prevalence estimate of “15–20% of adolescent females” exhibiting clinically relevant symptoms requires further contextualization. The authors should specify whether this prevalence refers to global estimates, Western populations, or specific national contexts. Moreover, discussing variability across countries and cultures would strengthen the epidemiological foundation of the study.

In the Data Analysis section, the authors indicate that “missing values representing less than 5% of the dataset were handled using multiple imputation procedures.” Additional information is required regarding the imputation method, number of imputations performed, predictor matrix specification, and assessment of convergence. Without these details, the reproducibility of the analytical procedure remains limited.

The description of hyperparameter optimization notes the use of “five-fold cross-validation and grid search procedures.” However, the manuscript does not report the final optimized hyperparameter values. The authors should provide the selected

learning rate, maximum depth, number of estimators, subsampling ratio, minimum child weight, and any regularization parameters to facilitate replication and allow readers to evaluate model complexity.

In the demographic results section, the statement that “preliminary screening indicated acceptable levels of normality and no evidence of multicollinearity” is difficult to reconcile with the machine-learning framework. Because XGBoost does not require normality assumptions, the rationale for emphasizing normality testing should be clarified. Furthermore, detailed diagnostics, including skewness, kurtosis, and full VIF statistics, should be reported in supplementary materials.

Authors uploaded the revised manuscript.

1.2. Reviewer 2

Reviewer:

The paragraph discussing social comparison theory asserts that “social comparison tendencies are positively associated with both general body dissatisfaction and specific disordered eating cognitions.” Although supported by citations, the manuscript would be strengthened by a more detailed explanation of the proposed causal mechanisms linking comparison processes to eating pathology. Clarifying whether body dissatisfaction mediates this relationship would improve conceptual coherence and align the introduction with the later machine-learning framework.

The paragraph beginning “Social media platforms, particularly those emphasizing visual content such as Instagram, TikTok, and Snapchat” presents a broad discussion of social media influences. However, the study exclusively investigates Instagram-related variables. The authors should justify why Instagram was selected over other platforms and discuss whether the findings can reasonably be generalized to TikTok, Snapchat, or emerging image-based platforms frequently used by adolescents.

The paragraph stating that “algorithms such as XGBoost offer advanced capabilities for integrating psychosocial and behavioral predictors” would benefit from a more rigorous methodological justification. The authors should explain why XGBoost was preferred over alternative machine-learning methods such as Random Forest, LightGBM, Support Vector Regression, Elastic Net, or Neural Networks. Comparative performance discussions would substantially enhance the methodological contribution of the manuscript.

In the final Introduction paragraph, the authors claim that previous studies “have examined either offline predictors or social media factors in isolation.” This assertion appears somewhat overstated. The authors should provide a more comprehensive synthesis of studies that have integrated both psychosocial and digital variables and clearly identify the precise gap that remains unaddressed in the literature.

Within the Study Design and Participants section, the manuscript reports recruitment from Ontario, British Columbia, Alberta, and Quebec using a multistage cluster sampling procedure. However, critical sampling details are missing, including the number of schools approached, school response rates, participant participation rates, and the number of students excluded before final analysis. Providing a participant flow diagram would substantially improve transparency and reproducibility.

The sentence “The final sample consisted of 1,284 adolescent girls aged between 13 and 18 years” requires additional demographic information. The authors should report socioeconomic status indicators, parental education levels, household income distribution, and urban-rural characteristics, as these factors are known correlates of both social media use and eating disorder symptomatology.

The Measures section describes the EDE-Q as the primary outcome variable, yet no reliability statistics are reported for the present sample. The authors should provide internal consistency estimates (Cronbach’s alpha, McDonald’s omega, or composite reliability) for all instruments used in the study. Reporting psychometric properties from previous studies alone is insufficient for evaluating measurement quality in the current dataset.

The paragraph describing the researcher-developed “Instagram Usage Characteristics Questionnaire” raises important concerns regarding measurement validity. While content validity through expert review is mentioned, no information is provided regarding pilot testing, factor structure, reliability coefficients, convergent validity, or criterion validity. Given that several of the most influential predictors originate from this instrument, substantially more psychometric evidence is necessary.

Authors uploaded the revised manuscript.

2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.