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# The role of psychological factors and physical activity in eating disorders in a student community sample.

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## Introduction

Eating Disorders (ED), such as anorexia, bulimia and binge eating, affect about 10% of young people. The main symptoms involve eating (restriction, excessive food intake) and weight control behaviors (laxatives, vomiting). However, psychological disorders (depression, anxiety, low self-esteem etc.) and problematic behaviors toward physical activity (PA) are also commonly associated with ED (Solmi et al., 2020; Treasure, 2020).

This study aims to assess the risk of ED in students, the PA (type, frequency and motivations for engaging in PA) and some psychological variables, and to examine their relationships based on the Jacobi risk factors model (Jacobi et al., 2004). We suppose that a high-risk of ED will be associated with more time spend to exercise, weight and shape control motivations and psychological disturbances.

## Material and method



A clustering analysis allowed to extract underlying risk profiles and a pattern-learning algorithm allowed to predict ED risk in extracted clusters. Finally, a non-parametric hypothesis test assessed the significance of each variable in the predictive model.

## Results

1924 complete records  
 72% women  
 21.49 years

Four clusters were extracted (figure 1), two groups with a low level of ED risk (EAT-26 mean of 6.9 and 7) and two groups with a high risk (EAT-26 mean of 14.9 and 15.3). Women represented 70% of the sample in the lowest risk group, 74% in the low risk group, 76% in the high risk group and 69% in the highest risk group.

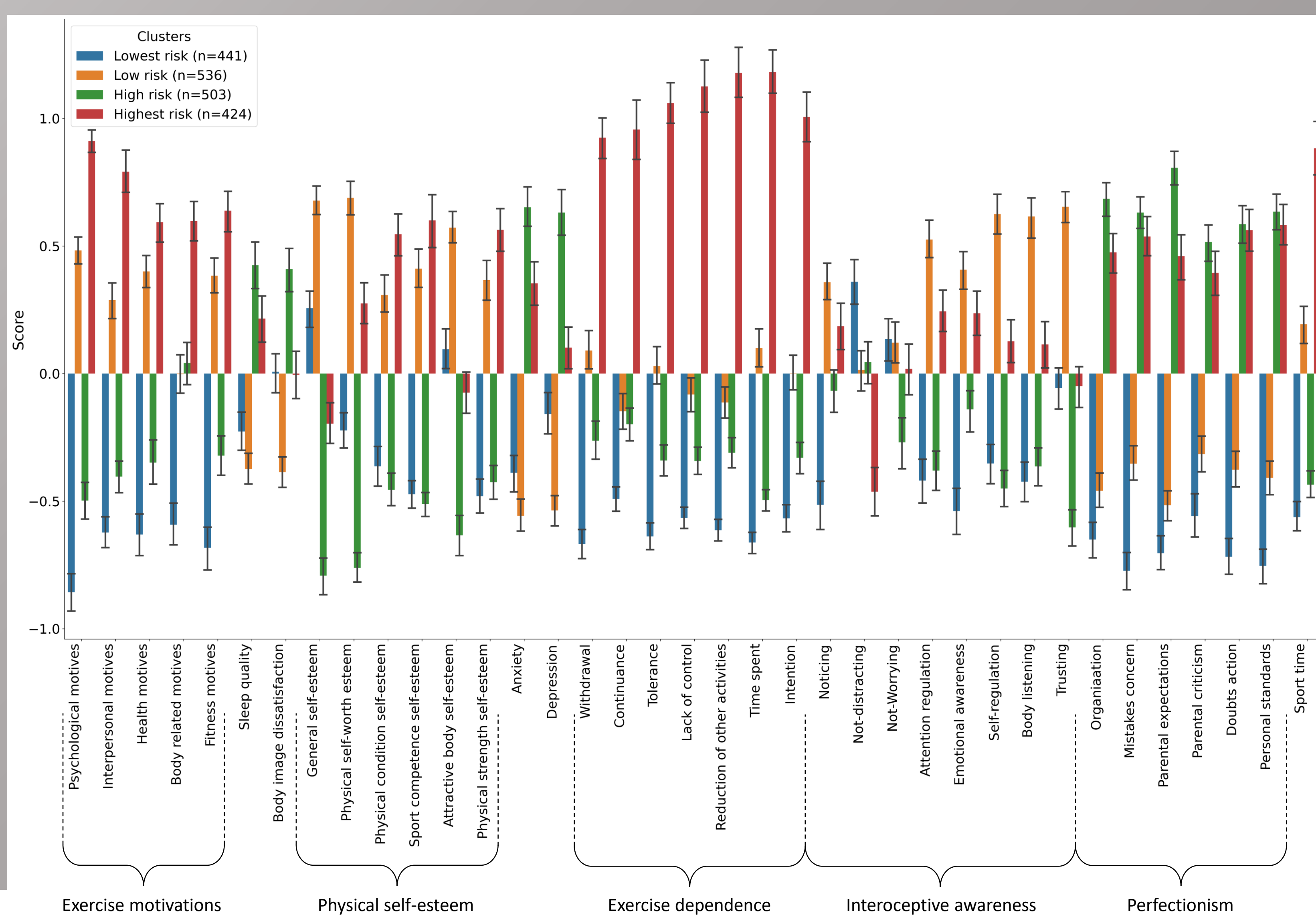


Figure 1. Clusters regarding ED risk.

Variable coefficients reveal how much a high score in the specific variable tend to increase (positive coefficient) ED risk or to decrease (negative coefficient) ED risk.

**+** Positive significant coefficients (risk factors)

**-** Negative significant coefficients (protective factors)

- body related motives
- body image dissatisfaction
- lack of control and reduction of activities (in exercise dependence)
- body mass index (BMI)
- organization, mistake concern and personal standards (in perfectionism)
- sleep quality
- anxiety
- attention regulation (in interoceptive awareness)
- psychological and fitness motives to exercise
- age
- trusting (in interoceptive awareness).

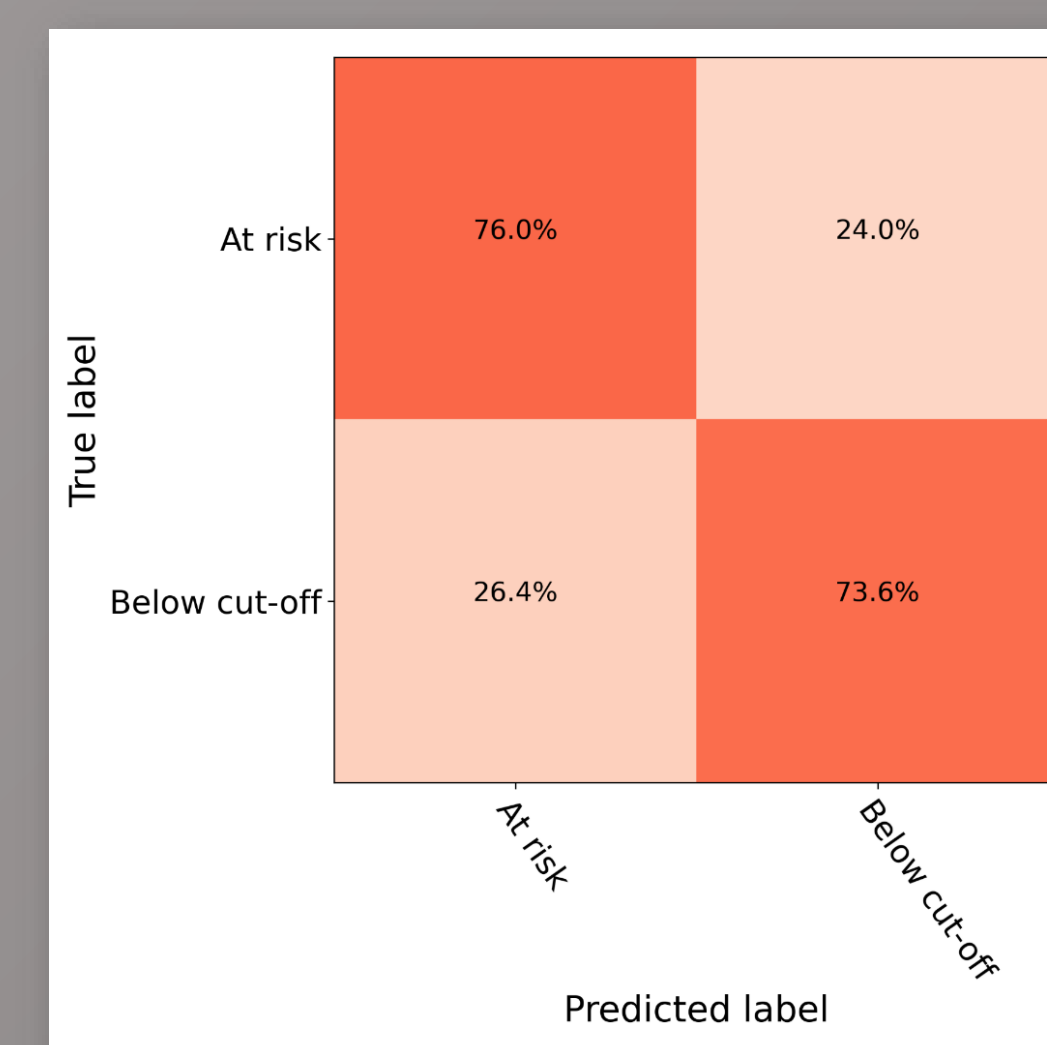


Figure 3. Predictive accuracy of the selected model

After a nested cross validation, the "Logistic Regression Classifier" algorithm was used on the two high ED risk clusters. The predictive model revealed an accuracy of 76% to predict people above the EAT-26 cut-off (=20) and 73.6% to predict people under the cut-off (figure 3).

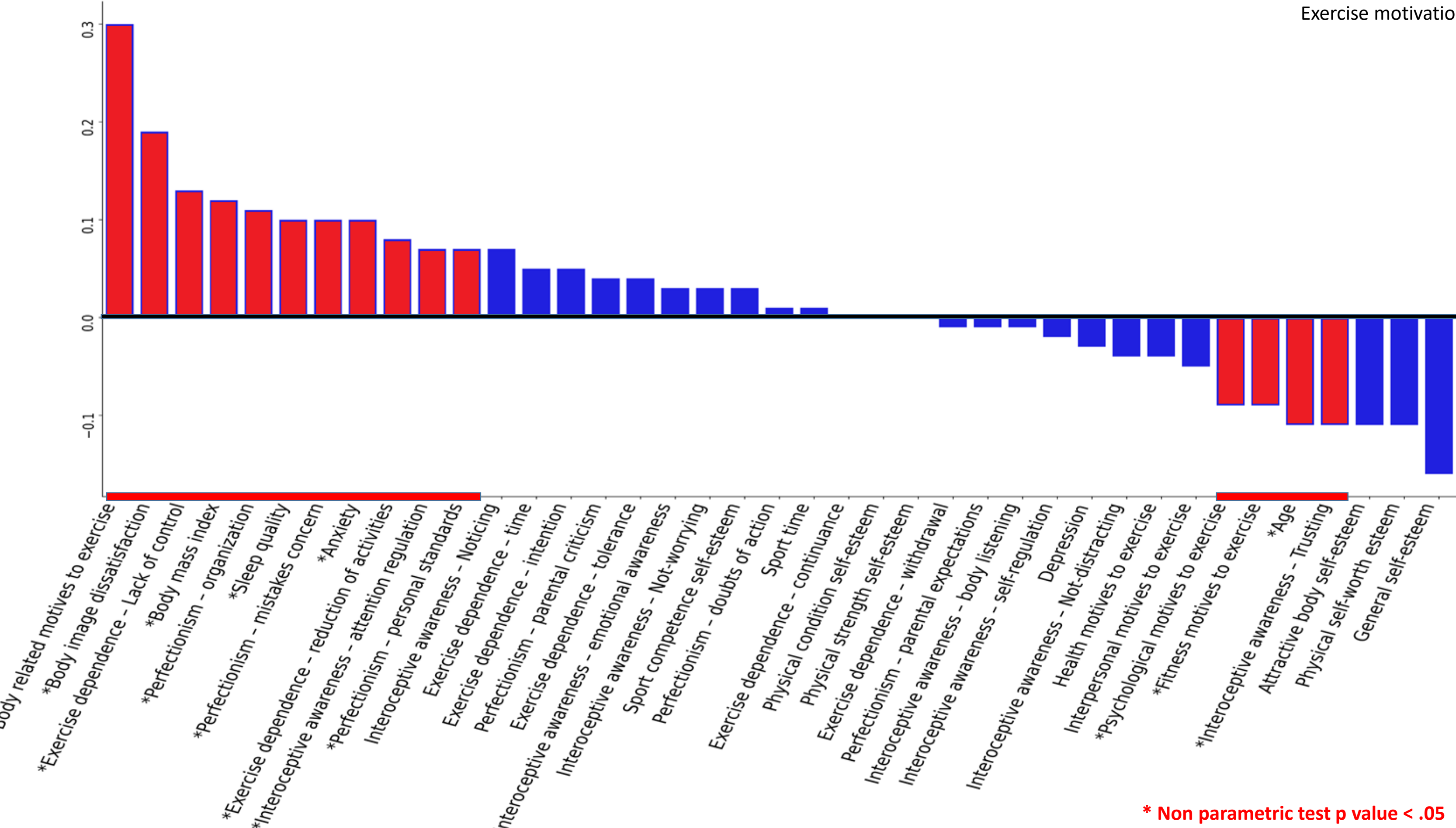


Figure 2. Variable coefficient in the predictive model

## Discussion

The clustering analysis revealed two kind of risk profile, a profile with no particular engagement in exercise (high risk group) and another profile with high engagement in exercise (motivations, dependence and time), a better self-esteem and a better interoceptive awareness (highest risk group). In any case, these two groups have common high scores (figure 4) in perfectionism, sleep quality and anxiety compared to low risk groups which could reveal core risk factors of ED. A further analysis compiled these two clusters to develop a predictive model. These factors confirmed what previous studies showed as high risk factors (Solmi et al., 2020; Treasure, 2020).

However, in accordance with our hypothesis, it exposed that body related motives to exercise, exercise dependence (lack of control and reduction of other activities), sleep quality and low level of attention regulation through interoceptive awareness could be considered as important risk factors. Furthermore, it revealed that trusting interoceptive awareness (confidence in body signals to assess your own state of mind), psychological (exercise to regulate mood) and fitness (to improve strength, flexibility and endurance) motives to exercise are protective factors.

## Conclusion

- This study is the first to use machine learning for ED risk factors identification on university students.
- Consistent with our precedent results in an adolescent sample (Toutain et al., 2023), anxiety and body related motives to exercise seem to be a key risk factor, as well as fitness motives to exercise seems to be a key protective factor.
- Sleep quality could be an important component regarding that it is a common factor between the two high risk groups.
- Our results confirmed that exercise is deeply involved in ED and further studies are needed to deeply investigate this question.

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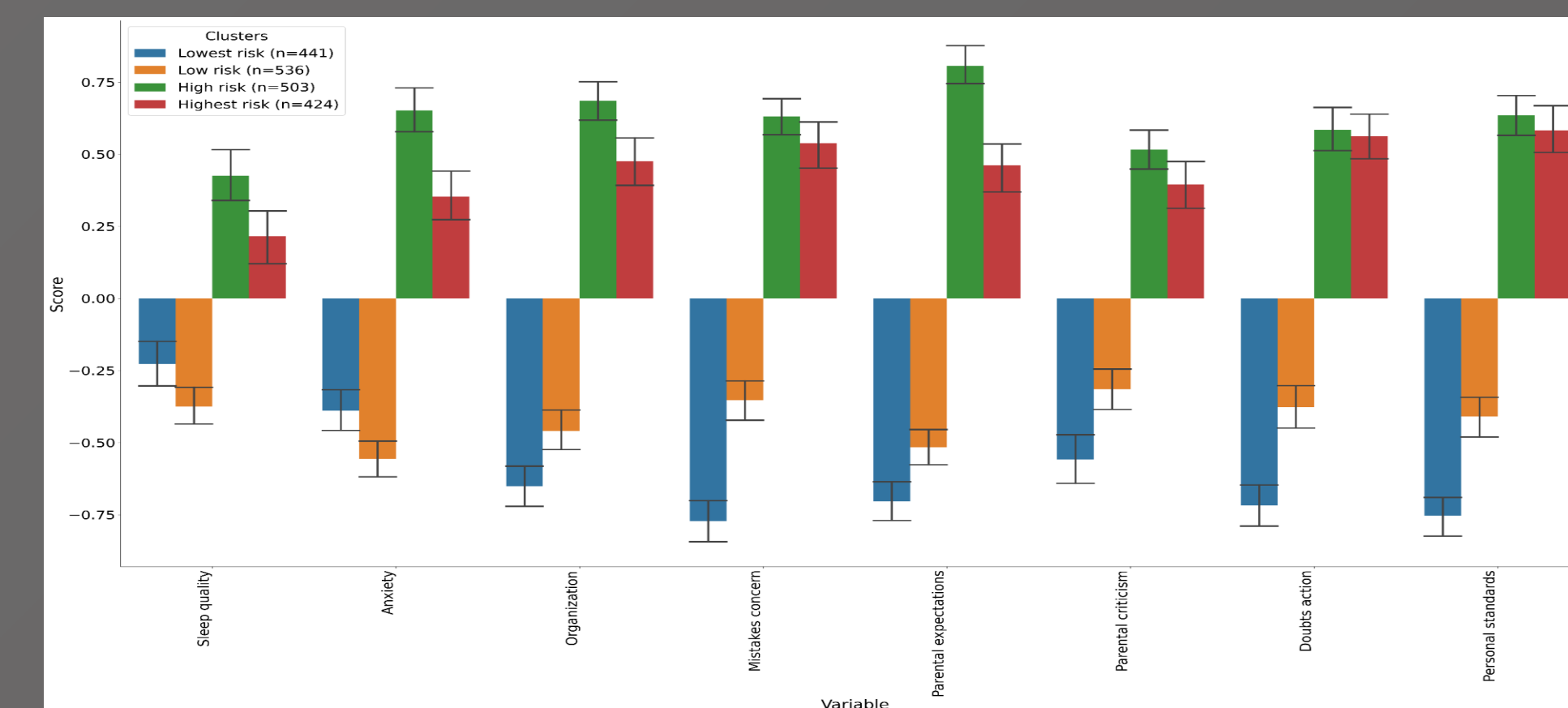


Figure 4. Common risk factors for high risk groups

**!** Anxiety and body related motives to exercise  
**✓** Fitness motives to exercise