

# THE POWER OF SELF-LOVE: AN ARTIFICIAL NEURAL NETWORK BASED ON NEUROSCIENCE INFERENCE TO PREDICT UNIVERSITY STUDENTS SELF-REPORTED MENTAL HEALTH DIMENSIONS (N.º 33)

Álvaro Fortunato Vaz<sup>1\*</sup>, Samuel Encarnação<sup>2,3</sup>, Paula Fortunato Vaz<sup>4</sup>, Filipe Vaz<sup>5</sup>, António Miguel de Barros Monteiro<sup>6,7</sup>

<sup>1</sup> Faculty of Medicine and Biomedical Sciences, University of Algarve, Campus da Penha, 8005-139 Faro

<sup>2</sup> Department of Physical Activity and Sport Sciences, Universidad Autónoma de Madrid (UAM), Ciudad Universitaria de Cantoblanco, 28049 Madrid, Spain

<sup>3</sup> Higher Institute of Educational Sciences of the Douro, (ISCE Douro), Portugal

<sup>4</sup> Research Centre in Basic Education (CIEB), Instituto Politécnico de Bragança (IPB), 5300-253 Bragança, Portugal

<sup>5</sup> Unidade de Saúde Pública (USP), Unidade Local de Saúde do Nordeste (ULSNE), 5301-852 Bragança, Portugal

<sup>6</sup> Department of Sport Sciences, Instituto Politécnico de Bragança (IPB), 5300-253 Bragança, Portugal

<sup>7</sup> Research Centre for Active Living and Wellbeing (LiveWell), Instituto Politécnico de Bragança, Bragança, Portugal

Corresponding author's contact: alvarovazdesp@gmail.com



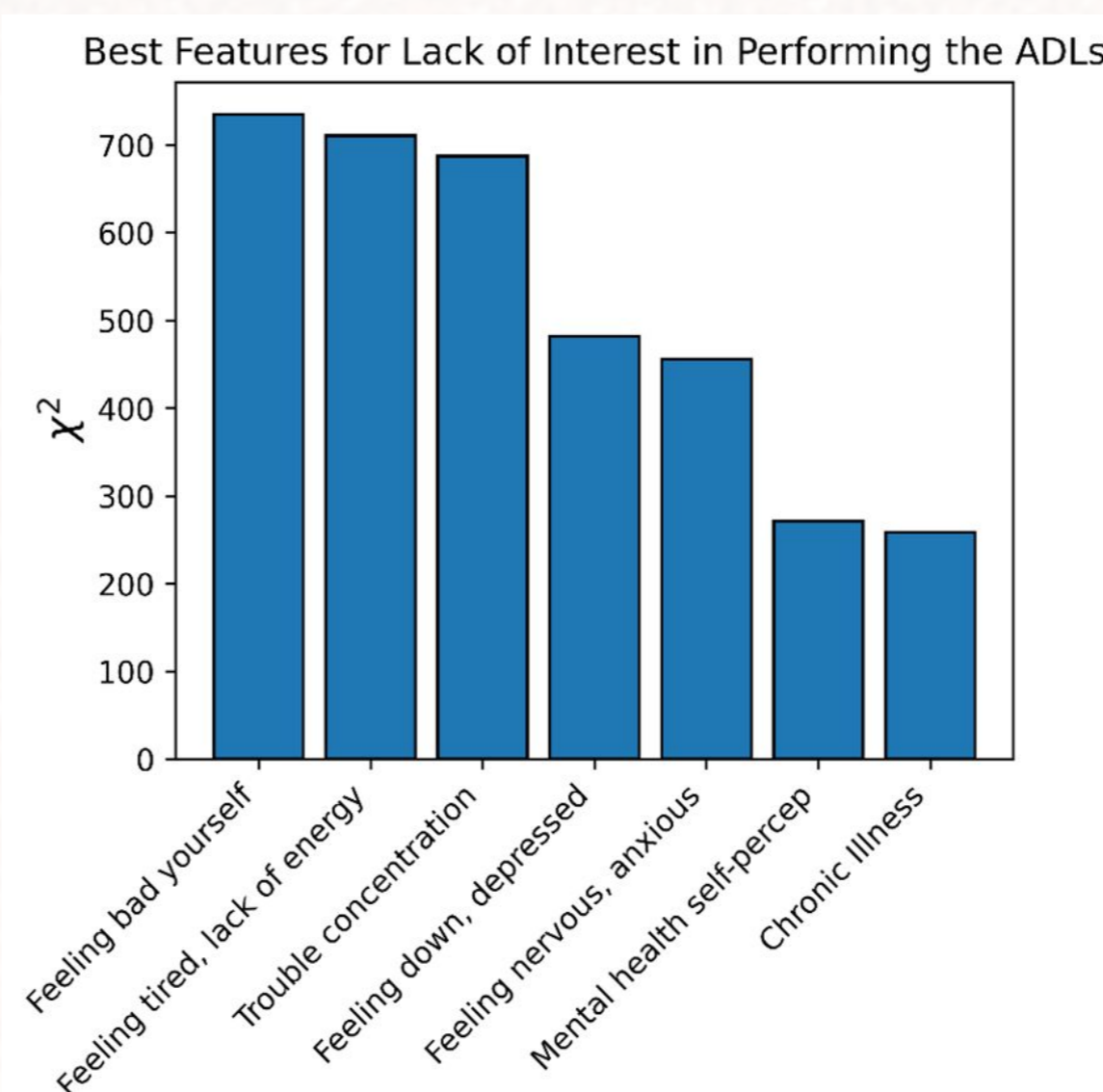
April 16th, 2024  
Faculty of Medicine,  
University of Lisbon

## BACKGROUND

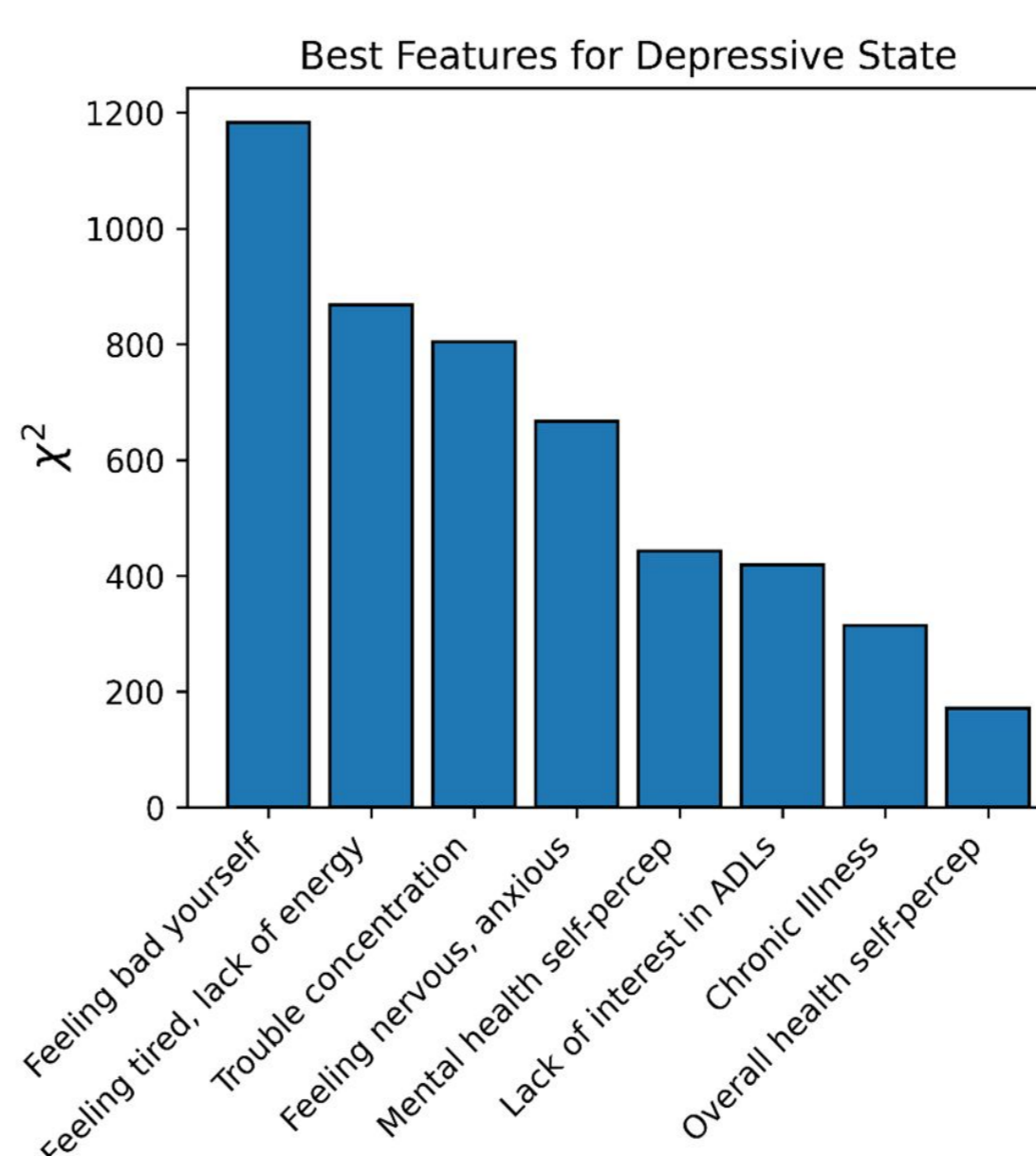
Student mental health is a global goal, first because it is health we are talking about and secondly because it has implications in the quality of learning and, consequently, in the adequate preparation of professionals for society.

## METHODOLOGY

- Data collection by questionnaire (2050 students, CTeSP, MD, PhD).
- Sociodemographic, behavioral and mental health features were recorded.
- Artificial Neural Network application.
- Algorithm validation.



- Felling bad with yourself predicted the student's depressive state with 97% accuracy and was cross-validated with good accuracy (73%).



- Felling bad with yourself predicted the student's lack of interest in performing their activities of daily living (ADLs) with 94% accuracy and was cross-validated with reasonable accuracy (67%).

## CONCLUSION

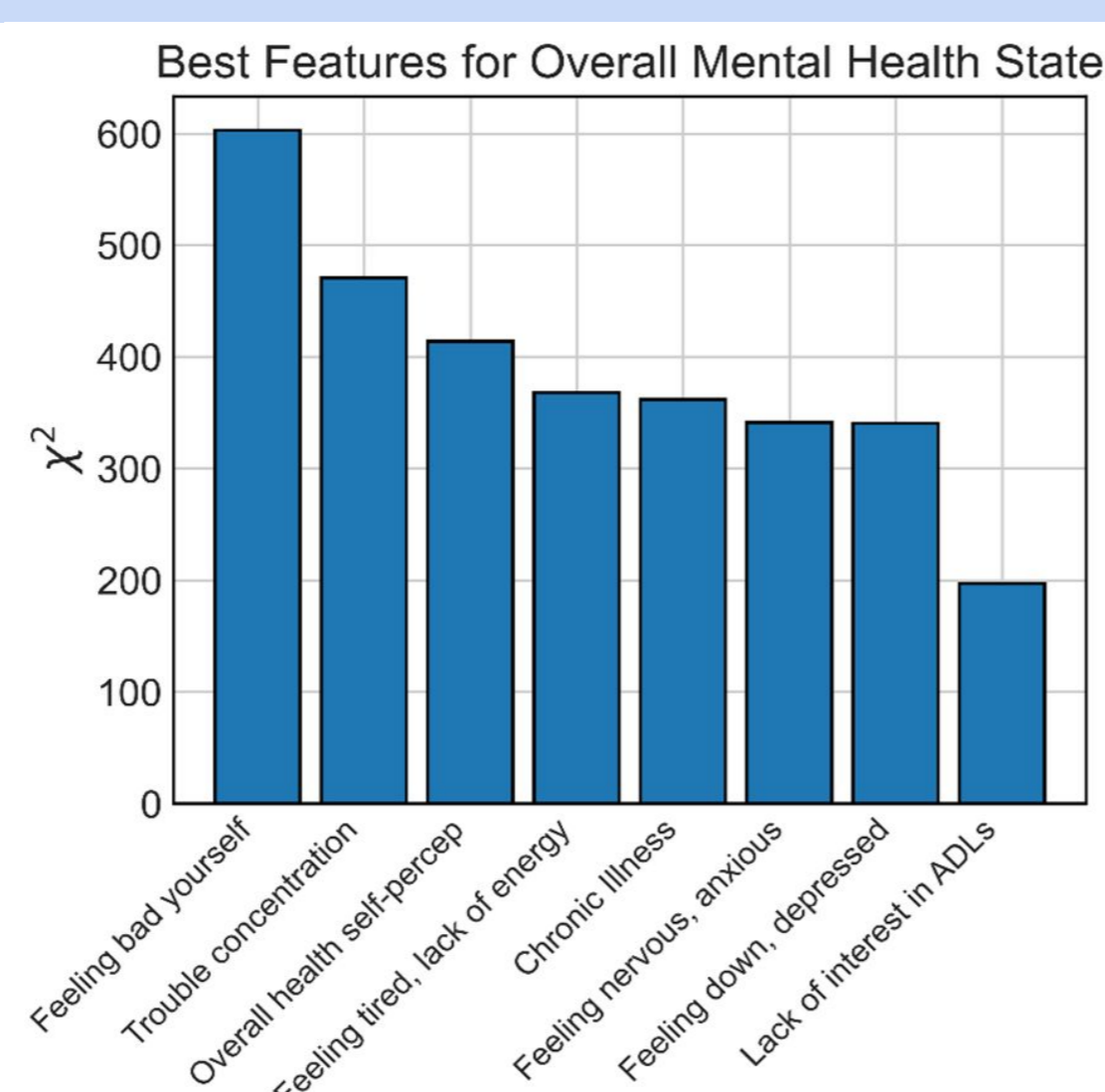
The ANN presented excellent learning performance (> 90%) for all targeted variables, within reasonable to good generalization capacity (60-73%).

Finally, the university student's depressive state was the best-predicted variable (73%).

## OBJECTIVE

To conduct an Artificial Neural Network (ANN) to predict the student's self-reported mental health dimensions.

## RESULTS



- Felling bad with yourself predicted student's overall mental health state self-perception: 94% accuracy and was cross-validated with reasonable accuracy (60%).

## REFERENCES

- Unpingco, J. (2016). *Python for probability, statistics, and machine learning* (Vol. 1). Springer.
- Yang, L., & Shami, A. (2020). On hyperparameter optimization of machine learning algorithms: Theory and practice. *Neurocomputing*, 415, 295–316. <https://doi.org/10.1016/j.neucom.2020.07.061>