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# Interoceptive awareness and yoga in patients with eating disorder: a preliminary descriptive analysis.

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## Introduction

Eating Disorders (ED), such as anorexia, bulimia and binge eating, affect about 10% of young people (Treasure, 2020). They are characterized by a deviant relationship with food and body, resulting in pathological eating and weight control behaviors. Physiological and psycho-cognitive comorbidities are commonly associated with ED, including an interoceptive deficit (Demartini et al., 2021).

The interoception can be considered as the interpretation of internal and external stimuli producing an overall representation of the state of the body, linked to a cognitive and emotional context and including conscious and unconscious aspects (Figure 1, Bertson & Khalsa, 2021). The conscious aspect is the interoceptive awareness, it is the ability to identify, access, understand, and respond appropriately to the patterns of internal signals, such as digestive system, muscle tension, heart rate, etc. (Price & Hooven, 2018).

Interoceptive awareness (IA) can be improved with mind and body practices like meditation or yoga (Demartini et al., 2021). To our knowledge, the effect of yoga on IA has not been studied in ED patients.

The aim of this study is to assess the effect of yoga on interoceptive awareness and ED symptoms in a clinical sample. We hypothesize that yoga will improve interoceptive awareness and ED symptoms.

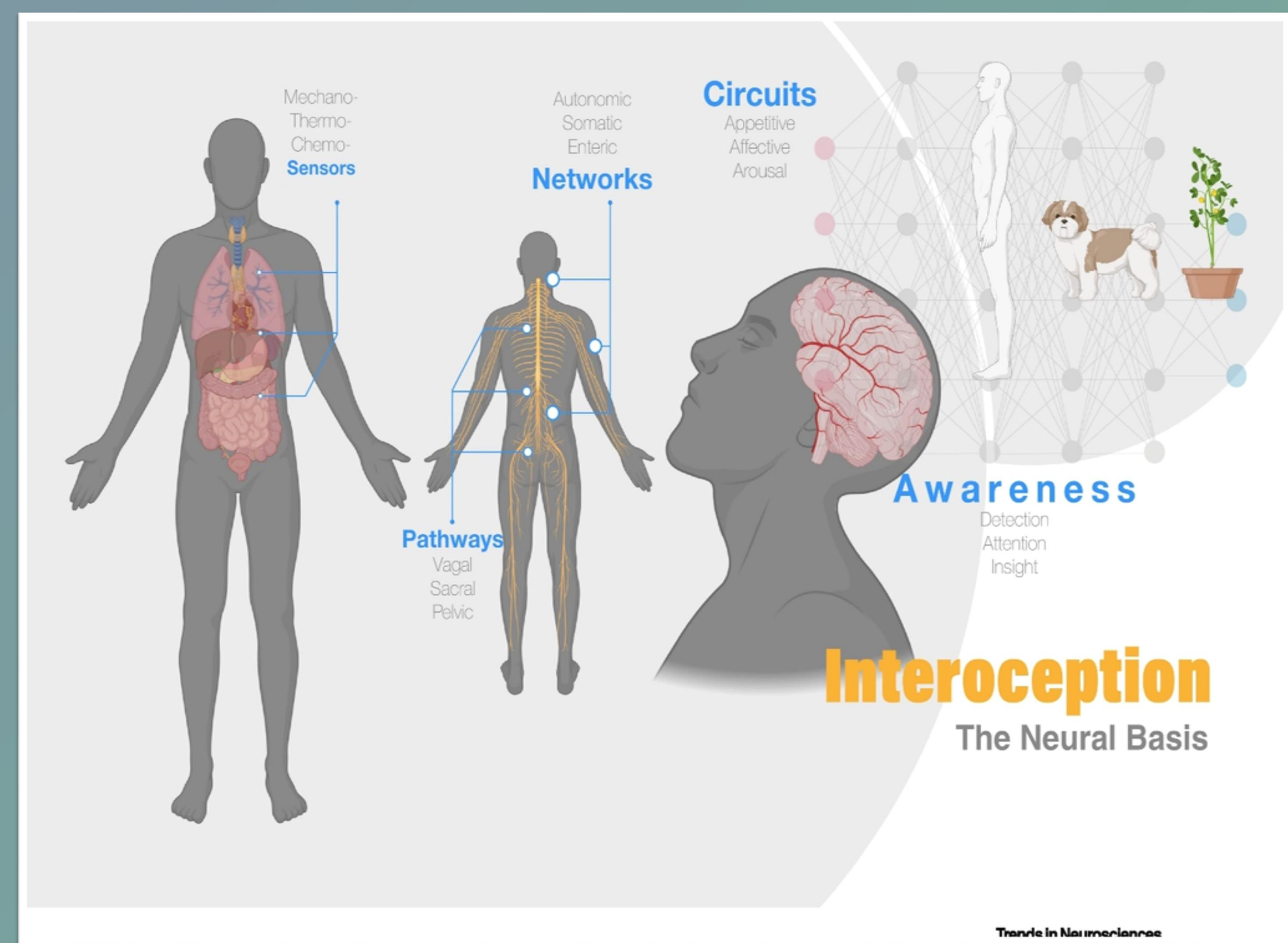
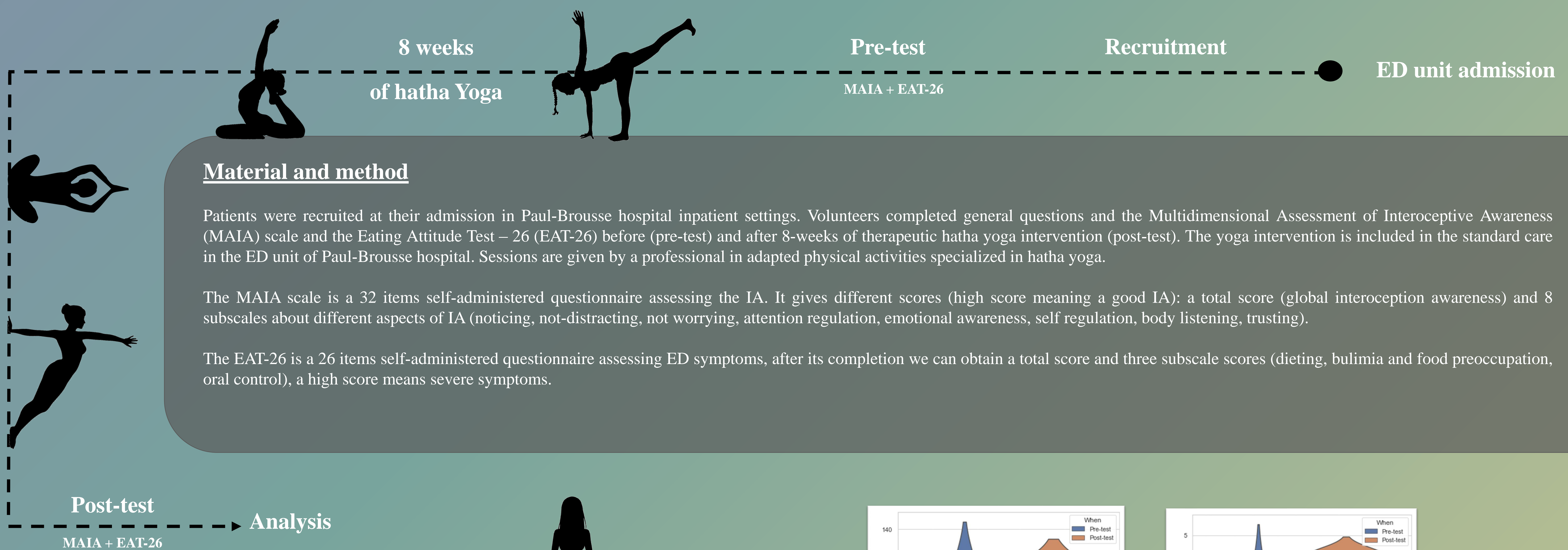


Figure 1. The Continuum of Interoception.

“Interoception is a neural process that traverses sensors, pathways, networks, circuits, and awareness. Each component contributes to the next, although most processing of interoceptive signals occurs beyond the conscious awareness of the organism. Further, interoceptive awareness relies on circuit-based representations of the internal bodily self (e.g., ‘my body’: manikín at top right) and differs substantially from other circuit-based representations of other living objects (e.g., ‘dog’, ‘plant’ etc.)” (Bertson & Khalsa, 2021)



## Material and method

Patients were recruited at their admission in Paul-Brousse hospital inpatient settings. Volunteers completed general questions and the Multidimensional Assessment of Interoceptive Awareness (MAIA) scale and the Eating Attitude Test – 26 (EAT-26) before (pre-test) and after 8-weeks of therapeutic hatha yoga intervention (post-test). The yoga intervention is included in the standard care in the ED unit of Paul-Brousse hospital. Sessions are given by a professional in adapted physical activities specialized in hatha yoga.

The MAIA scale is a 32 items self-administered questionnaire assessing the IA. It gives different scores (high score meaning a good IA): a total score (global interoception awareness) and 8 subscales about different aspects of IA (noticing, not-distracting, not worrying, attention regulation, emotional awareness, self regulation, body listening, trusting).

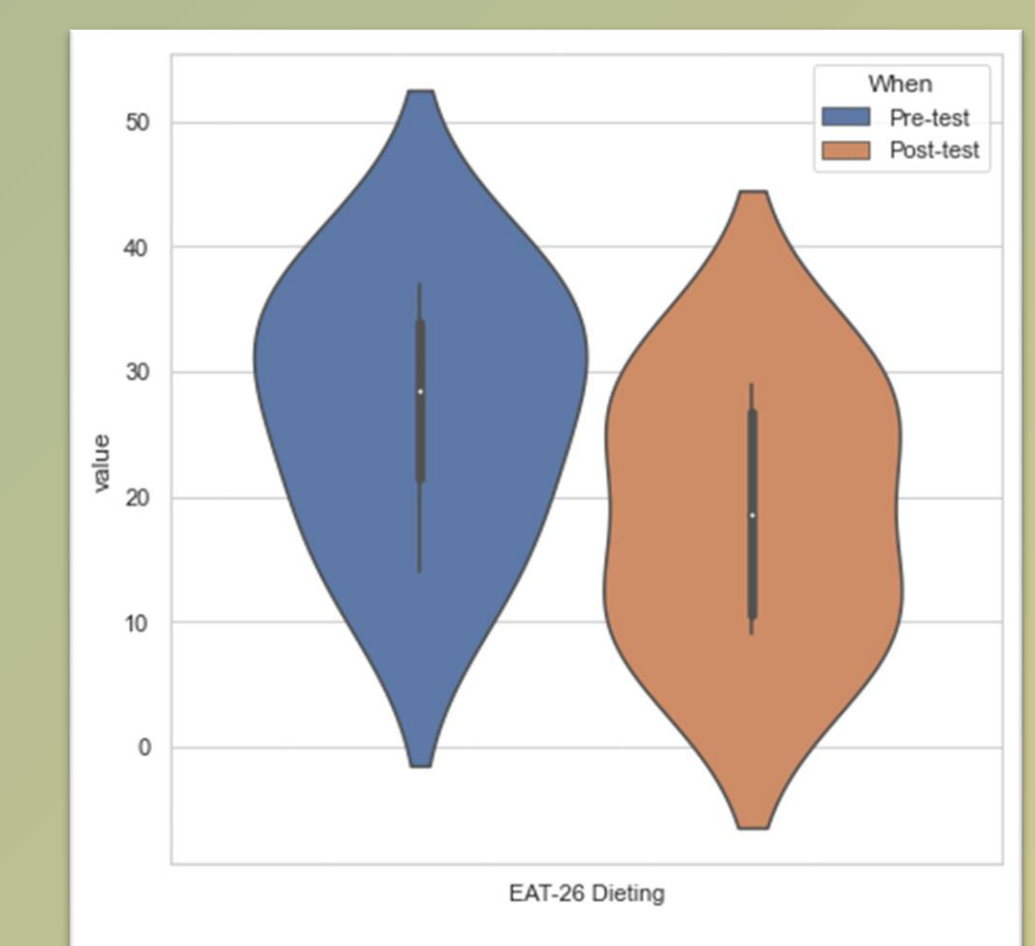
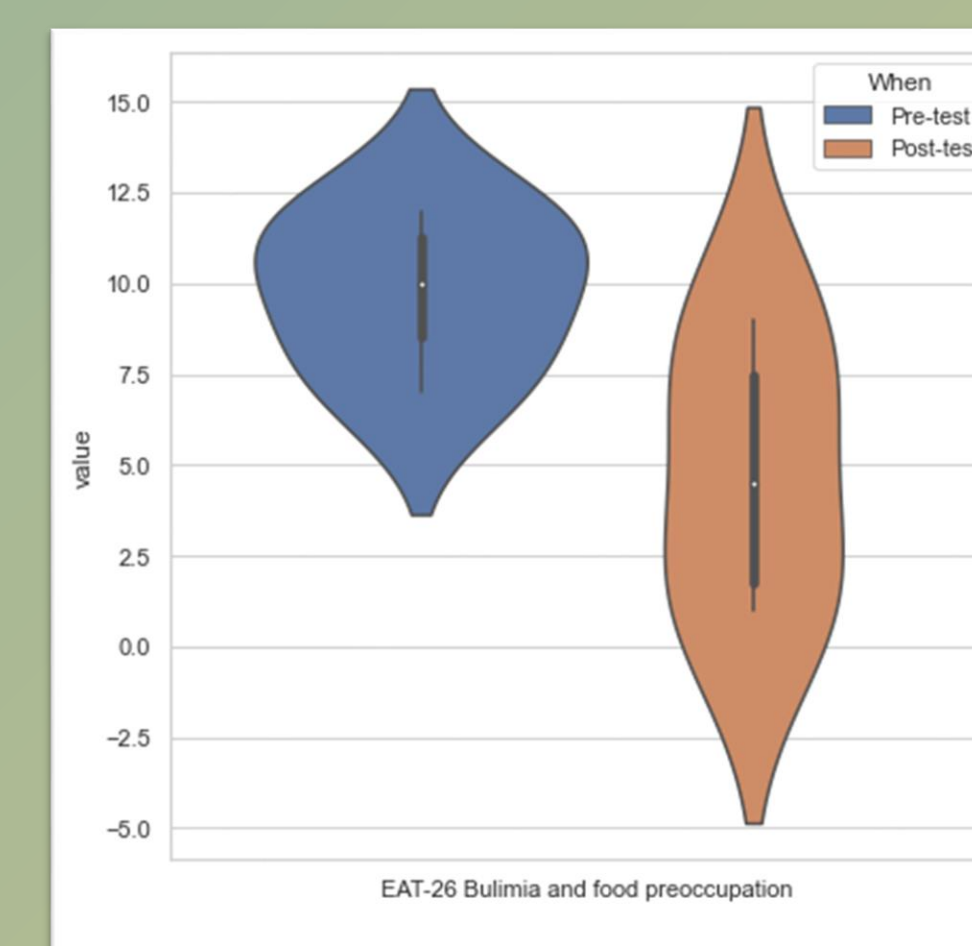
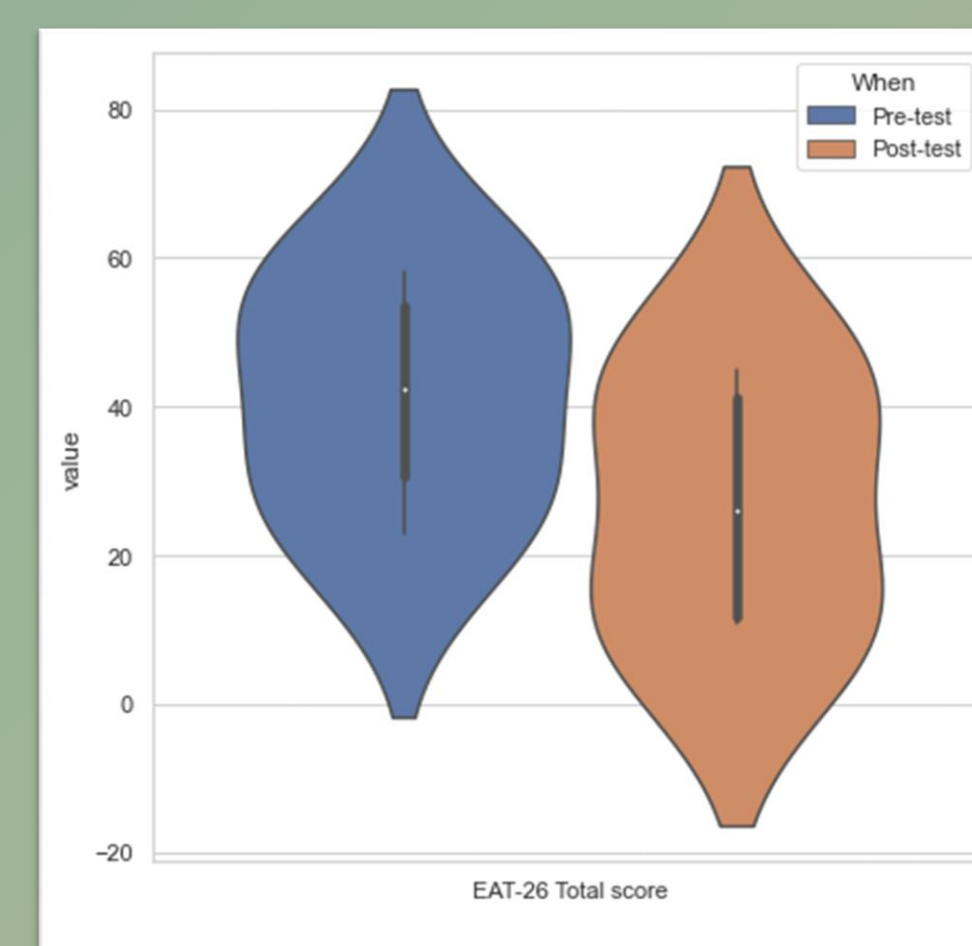
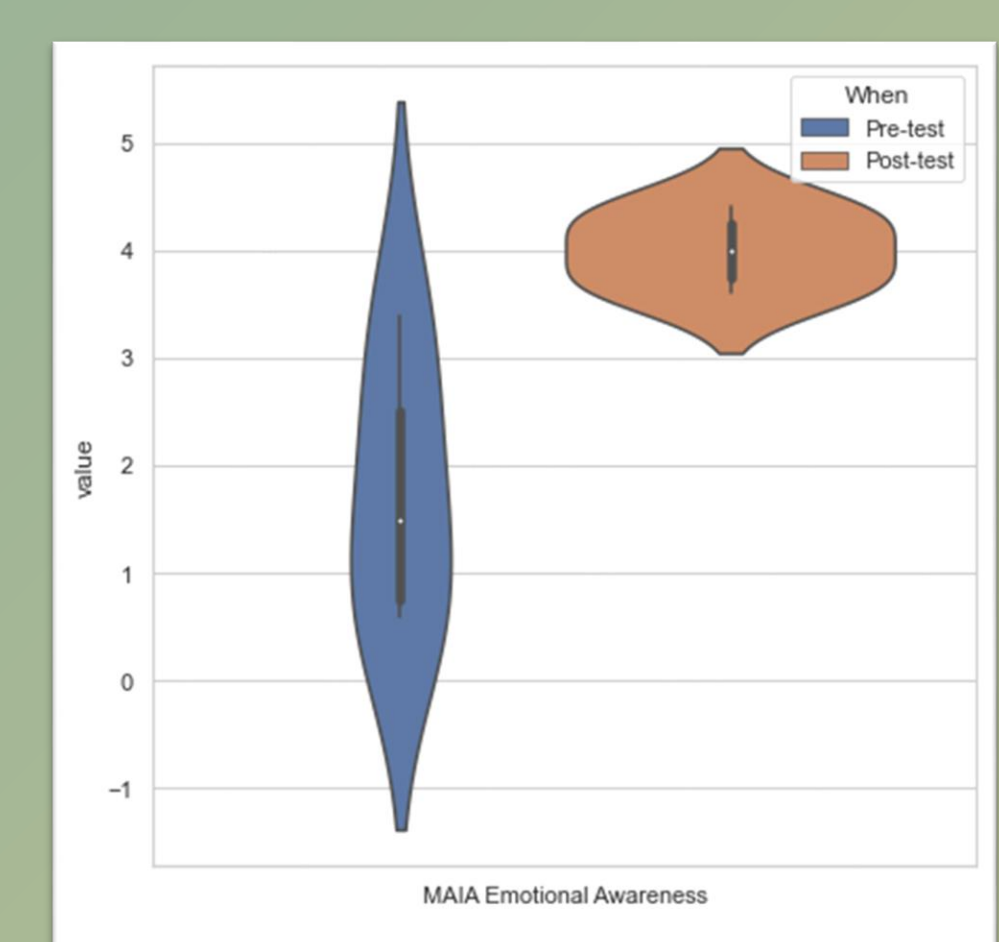
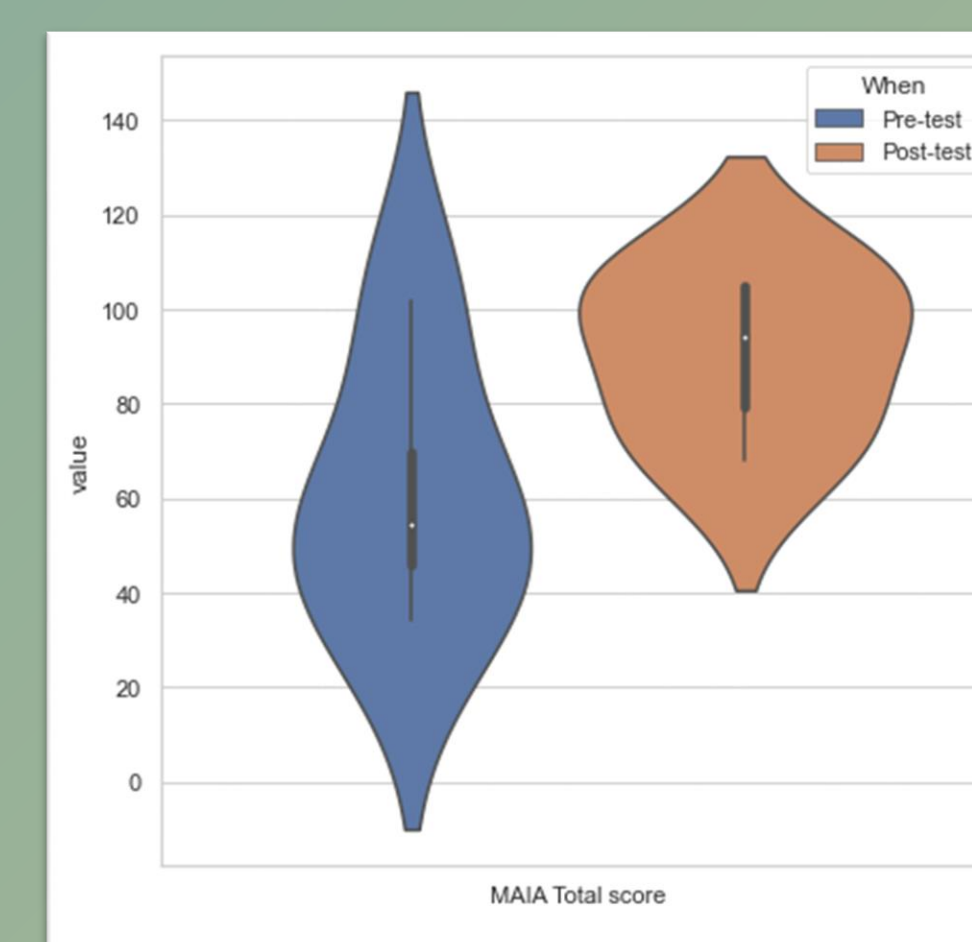
The EAT-26 is a 26 items self-administered questionnaire assessing ED symptoms, after its completion we can obtain a total score and three subscale scores (dieting, bulimia and food preoccupation, oral control), a high score means severe symptoms.

## Results

Currently, four participants have completed the protocol. The sample mean age was 21,5 (±3,69) years, the mean body mass index was 19,47 (±1,51) kg/m<sup>2</sup> and three were suffering of anorexia and one of bulimia.

A descriptive analysis showed that the total MAIA score improved after the 8 weeks of yoga, with a mean pre-yoga score of 61/160 (±29) and a mean post-yoga score of 90/160 (±18). The subscale of emotional awareness seemed to be an important part of this improvement with a mean pre-yoga score of 1,75/5 (±1,31) and a mean post-yoga score of 4/5 (±0,36).

In addition, the EAT-26 total score showed a great diminution with a mean pre-yoga score of 41,5/78 (±16,3) and a mean post-yoga score of 27/78 (±18). Two subscales seemed to explain this improvement: the dieting subscale with a mean pre-yoga score of 27/78 (±10) and a mean post-yoga score of 18,75/39 (±10) and the bulimia and food preoccupation subscale with a mean pre-yoga score of 9,75/18 (±2,21) and a mean post-yoga score of 4,75/78 (±3,86).



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## Discussion and conclusion

The MAIA score increase should demonstrate a positive effect of yoga on IA. The strong improvement in the emotional awareness seems to indicate that yoga can specifically target this IA dimension. However our sample showed a lower mean (1,75/5) and a higher standard deviation (±1,31) compared to other adult ED sample in the literature with a mean of 2,96/5 (±1,23) for this subscale which could be a bias linked to the small size of the sample (Brown & al., 2017).

The EAT-26 decrease is in accordance with the literature and should reveal an improvement of ED symptoms after yoga therapeutic intervention (Borden & Cook-Cottone, 2020).

The sample size was small and additional data are needed for inferential analysis as well as a control group to assess the actual contribution of yoga to these results. Nevertheless this first descriptive analysis suggest a positive effect of yoga on IA for ED outpatients

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