

## DYSPHORIA DIMENSIONAL MODEL FOR FEEDING AND EATING DISORDERS: A PRELIMINARY STUDY

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### SUMMARY

**Background:** Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Binge Eating Disorder (BED) are severe psychiatric illnesses which represent the main expression of Feeding and Eating Disorders (FED). Clinicians agree that emotional and behavioural dysregulation play a crucial role in FED. Dysphoria could help us to better understand these components. Indeed, we define dysphoria as a generic state of dissatisfaction and emotional instability, without any specific features. Among the multitude of symptoms, we find that irritability, discontent, interpersonal resentment and surrender prevail. These dimensions correspond to the four subscales of Neapean Dysphoria Scale - Italian version (NDS-I). Dysphoria role in FED has not yet been investigated. Using this test, we can characterize dysphoria both in quantitative and qualitative terms. Accordingly, domain evaluation could discriminate these disorders allowing us to assess possible differential phenomenological expressions.

**Aims:** The aim of this paper is to understand in which way the dimensional spectrum that composes dysphoria differs between Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorders through an observational comparative study.

**Subjects and methods:** The enrolled sample (30 patients) is represented by patients with a history of FED (AN, BN or BED). Patients were males and females between the ages of 13 and 45 with a good knowledge of Italian language. Patients with severe cognitive impairment (MMSE <19) and civil incapacitation were excluded. Patients were recruited from the Psychiatric Service of the Santa Maria della Misericordia Hospital in Perugia (PG), and other residential and semi residential structures specialized in FED treatment (FED specialized center at Palazzo Francisci in Todi (PG), Nido delle Rondini in Todi (PG), BED (Binge Eating Disorders) center in Città della Pieve (PG) and ambulatory services for FED in Umbertide (PG)). We administered them the Neapean Dysphoria Scale - Italian Version (NDS-I), a specific dimensional test for dysphoria. Starting from the dataset, with the aid of the statistical program SPSS 20, we have carried out a comparison between disorders groups selected and NDS-I total score and subscales (irritability, discontent, interpersonal resentment, surrender). For this we have used the Mann-Whitney U test, a nonparametric test with 2 independent samples, by setting a significance level  $p < 0.05$ .

**Conclusions:** This study allowed us to better understand and characterize the most common Eating Disorders. Beyond that, despite the small sample size, we found in our analysis statistically significant difference in the expression of various dysphoria dimension spectrum inside our 3 groups.

**Key words:** dysphoria - anorexia nervosa - bulimia nervosa - binge eating disorder- NDS-I

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### INTRODUCTION

Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Binge Eating Disorder (BED) are severe psychiatric illnesses which represent the main expression of Feeding and Eating Disorders (FED).

These affect 13% of girls and women and are marked by chronicity, relapse, distress and functional impairment (Stice et al. 2019). In AN, BN and BED there is a persistent alteration of eating behaviour, such as restricted intake in AN or bingeing and purging (f.e. self-induced vomiting and/or abuse of laxatives, diuretics and physical hyperactivity or extreme dieting), as well as excessive concerns about body shape and body weight (Gravina et al. 2018). About that we can differentiate BN from BED because in the first one binge eating is accompanied by a loss of control, over eating and attempts to prevent weight gain (Kaltiala-Heino et al. 2003).

Clinicians agree that emotional and behavioural dysregulation play a crucial role in FED (Cimballi et al. 2017). In this regard, it is widely documented that emo-

tion regulation difficulties influence the etiology and maintenance of FED (Racine et al. 2018). Emotion dysregulation across multiple dimensions is common to AN, BN and BED but there are important limitations of existing research: reliance on self-report, small/widely varying samples and few longitudinal studies (Jason et al. 2015). To better investigate these eating disorders, we can focus on the possible affective comorbidities found, such as bipolar disorder, depression, anxiety and personality disorder.

Many factors impact on the course of FED, and among these, personality characteristics play a key role. Personality disorders are highly common in patients with FED, with a prevalence of cluster C in AN, cluster B in BN and BED (Rotella et al. 2016). In support of this, the perfectionism, a central feature of DOC, is a fundamental cognitive process also in AN (Levison et al. 2018). The subject establishes strict rules of conduct that aim to achieve an ideal body weight. In this way, he builds self-confidence, therefore we find traits of narcissistic personality too (Barajas-Iglesias et al.

2017). While in AN there is an over-controlled personality and cognitive rigidity, in BN and BED we have typical features of the borderline personality as impulsiveness and affective lability. Patient with BN is pervaded by instability and psychomotor activation that find the culmination in the binge episode. Initially it is relieved, then it is followed by a sense of guilt and self-depreciation and the implementation of compensatory behaviour (Thibeaut et al. 2018). In BED, there is a condition of pure discontrol; impulsivity seems to be a predictive factor for the development of overweight and obesity (Gaudio et al. 2017).

The knowledge of temperamental traits and of their relationship with specific ED is relevant for the design of specifically targeted intervention (Rotella et al. 2017).

Dysphoria could help us to better understand FED. Indeed, we define dysphoria as a generic state of dissatisfaction and emotional instability, without any specific features. It's generally considered a temperamental trait, but its phenomenological expression is in response to environmental stimuli (D'Agostino et al. 2016). Alongside this general description, dysphoria can be distinguished in three specific dimensional components: tension, irritability and urge. Tension is a condition of strong emotional pressure, chronic unhappiness and discontent which leads the subject to surrender. Irritability refers to a state of a constant and annoying restlessness, worry and anxiety. The subject is suspicious and hostile towards people around him. Finally, urge is characterized by impatience and intolerance, by an irresistible need to act, with often self-harm behaviours. Action is violent in the sense of the intensive emotions that invest the subject (Moretti et al. 2018). Among the multitude of symptoms, we find irritability, discontent, interpersonal resentment and surrender prevail. These dimensions correspond to the four subscales of Neapen Dysphoria Scale - Italian version (NDS-I). Dysphoria role in FED has not yet been investigated. Using this test, we can characterize dysphoria both in quantitative and qualitative terms. Accordingly, domain evaluation could discriminate these disorders allowing us to assess possible differential phenomenological expressions. The aim of this paper is to understand in which way the dimensional spectrum that composes dysphoria differs between Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorders through an observational comparative study.

## SUBJECTS AND METHODS

### Subjects

In the present prospective study, have been enrolled patients (30 patients) with an history of FED (AN, BN or BED). Patients were males and females between the ages of 13 and 45 with a good knowledge of Italian language. Patients with severe cognitive impairment (MMSE <19) and civil incapacitation were excluded. They were recruited from the Psychiatric Service of the Santa Maria della Misericordia Hospital in Perugia (PG),

Umbria, Italy, and other residential and semiresidential structures specialized in FED treatment of our region (FED specialized center at Palazzo Francisci in Todi (PG), Nido delle Rondini in Todi (PG), BED (Binge Eating Disorders) center in Città della Pieve (PG) and ambulatory services for FED in Umbertide (PG)). All selected patients signed their informed consent prior to inclusion in the study.

We present preliminary data because our study is still in progress; we are recruiting patients with the objective of collecting at least 100 of them. Our aim is also to re-administer the test one month after the first evaluation.

### Methods

All patients had administered the Neapen Dysphoria Scale – Italian Version (NDS-I), a specific dimensional test for dysphoria (D'Agostino et al. 2016). This psychometric test indicates not "how much" but "how" the subject is dysphoric (Moretti et al. 2018). We can use it thanks to D'Agostino and his working group, who translated it from the homonymous NDS introduced in Australia by Starcevis (Starcevis et al. 2007). This auto-administrated test consists of 24 items in Likert scale from 0 to 4. At the end of the test is possible to obtain a specific Total Score which gives a rough assessment of the degree of dysphoria and other 4 additional scores which represent the dimensional subscales of dysphoria. These are irritability, discontent, interpersonal resentment, renunciation/surrender. The test hasn't any cut-off because it represents a dimensional, non-nosographic tool.

Starting from the dataset, with the aid of the statistical program SPSS 20 (Statistical Package for Social Sciences), we have carried out a comparison between disorders groups selected and NDS-I total score and subscales. For this we have used the Mann-Whitney U test, a nonparametric test with 2 independent samples, by setting a significance level  $p < 0.05$ .

### Statistical analyses

Patients enrolled in the study were 30, divided in 3 groups of 10: Anorexia Nervosa, Bulimia Nervosa and Binge Eating Disorder. All of them gave an informed consent according to the current EU regulations on privacy through an information talk and related. After that, we instructed patients about the correct compilation of the test and we administrated NDS-I. Finally, we collected the data in a specific database and we started our analysis. Just because is a preliminary study with only 30 patients, we decided to avoid the division by gender by considering males and female in the same way. Starting from the dataset, by using the statistical program SPSS 20, we have obtained graphs showing the comparison between disorders groups and NDS-I total score and subscales. In order to provide a quantitative imprint, we have calculated arithmetic means of each

subscale for each group of patients. The comparison between groups has been possible by considering two groups at time: we used the U Mann-Whitney test, a nonparametric test with 2 independent samples, by setting a significance level  $p < 0.05$ .

## RESULTS

Analyzing the graphs obtained we tried to put in evidence, both for the total score and for the subscales, some differential dimensional aspect.

In Table 1 we can see that there aren't significant differences between NDS Total Score and NDS subscales if we compare patients with AN and BN by using Mann-Whitney U test Anorexia vs Bulimia with a significance level  $p < 0.05$ .

In Table 2 instead, comparing the scores between AN and BED patients, we find that the NDS-I Interpersonal Resentment Subscale Score is higher in BED patients with a statistically significant difference ( $p = 0.022$ ). The data was obtained with the Mann-Whitney U test (Anorexia vs BED) with a significance level  $p < 0.05$ . There aren't any other significant data in the differences between the two groups.

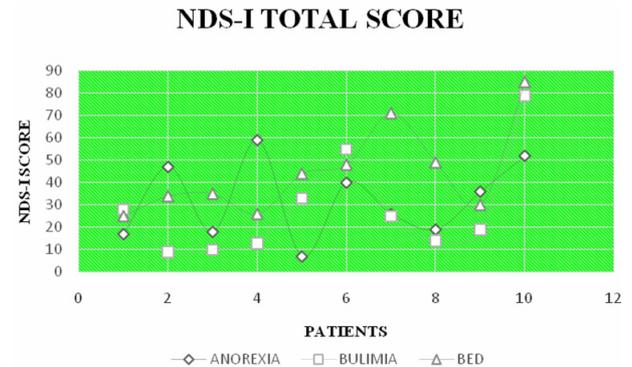
In Table 3, comparing BN and BED patients, some difference can be remarked: NDS-I total score is higher in BED patients with statistically significant differences ( $p = 0.038$ ).

On the other hand, the difference between the total scores means of the two groups shows no significant differences ( $p > 0.05$ ).

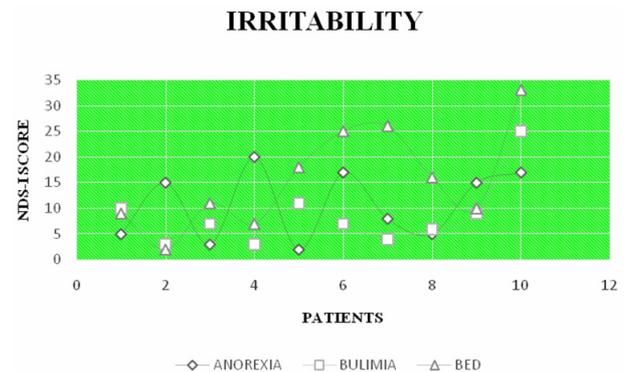
In Table 4 we have translated in numerical language the differences between groups. The arithmetic mean of the total score on the NDS-I test and the related subscales, show what we have previously expressed: BED

patients have a greater level of dysphoria and an interpersonal resentment major than others in a meaningful way.

We can represent by graphs the analysis of the data to highlight some differential dimensional aspects (Figure 1, 2, 3, 4, 5).



**Figure 1.** Comparison between groups of patients and the NDS-I total score



**Figure 2.** Comparison between groups of patients and the NDS-I Irritability Subscale Score

**Table 1.** Statistical comparison between AN and BN total scores and subscale scores

	NDS-I Total Score	NDS-I Irritability	NDS-I Discontent	NDS-I Interpersonal Resentment	NDS-I Surrender
U di Mann-Whitney	40,500	42,000	49,000	45,500	31,000
Sig. Asint. 2 tails	0.473	0.544	0.939	0.731	0.149

Notes: NDS = Nepean Dysphoria Scale-Italian Version

**Table 2.** Statistical comparison between AN and BED total scores and subscale scores

	NDS-I Total Score	NDS-I Irritability	NDS-I Discontent	NDS-I Interpersonal Resentment	NDS-I Surrender
U di Mann-Whitney	33,500	34,500	29,000	20,000	44,000
Sig. Asint. 2 tails	0.212	0.241	0.111	0.022	0.648

Notes: NDS = Nepean Dysphoria Scale-Italian Version

**Table 3.** Statistical comparison between BN and BED total scores and subscale scores

	NDS-I Total Score	NDS-I Irritability	NDS-I Discontent	NDS-I Interpersonal Resentment	NDS-I Surrender
U di Mann-Whitney	22,500	25,000	35,500	25,500	33,000
Sig. Asint. 2 tails	0.038	0.058	0.271	0.063	0.198

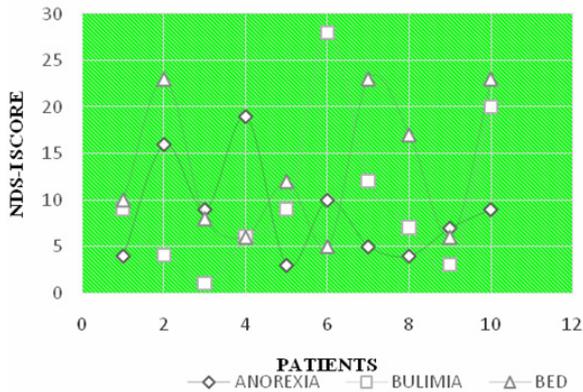
Notes: NDS = Nepean Dysphoria Scale-Italian Version

**Table 4.** Arithmetic mean of the total score on the NDS-I test and the related subscales for the 3 study groups

	Anorexia	Bulimia	Bed
NDS-I Total Score Mean	31.1	28.5	44.7
Irritability Score Mean	10.7	8.5	15.7
Discontent Score Mean	8.6	9.9	13.3
Interpersonal Resentment Score Mean	4.2	4.8	8.3
Surrender Score Mean	7.9	5.4	7.4

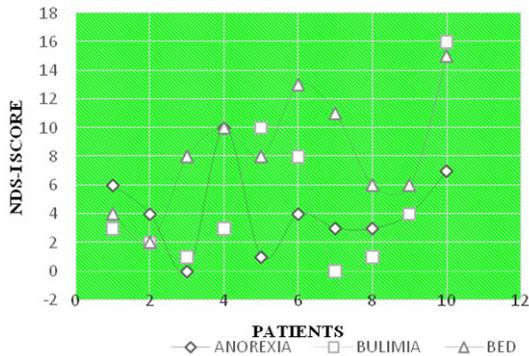
Notes: NDS = Nepean Dysphoria Scale-Italian Version

### DISCONTENT



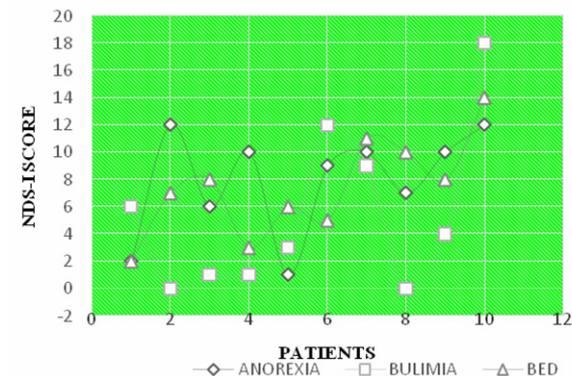
**Figure 3.** Comparison between groups of patients and the NDS-I Discontent Subscale Score

### INTERPERSONAL RESENTMENT



**Figure 4.** Comparison between groups of patients and the NDS-I Interpersonal Resentment Subscale Score

### SURRENDER



**Figure 5.** Comparison between groups of patients and the NDS-I Surrender Subscale Score

### CONCLUSIONS

The present study, through a tranonographic-dimensional approach, helps us to explore, despite the small sample, dysphoria and its expression. It allowed us to better understand and characterize the most common Eating Disorders. Between means of values obtained, some differences were statistically significant: in particular BED patients had a higher score of dysphoria and an interpersonal resentment greater than BN and AN patients. These differences, if confirmed by the increase in the sample size, could be good clinical indicators of differential diagnosis and longitudinal surveillance in order to capture possible relapses or transition from one category to another. We expect to enlarge the sample to confirm our results and provide to the clinicians a better instrument to perform early diagnoses and intervention.

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**Conflict of interest:** None to declare.

**Contribution of individual authors:**

Roberta Lanzi, Massimo Claudio Bachetti & Patrizia Moretti conceived and designed the study.

Roberta Lanzi wrote the first draft of the manuscript.

Roberta Lanzi & Massimo Claudio Bachetti performed statistical analyses.

Roberta Lanzi, Cecilia Giulietti & Margherita Rosi visited patients and carried out clinical work.

Patrizia Moretti & Alfonso Tortorella supervised all phases of the study. All authors approved the final version of the manuscript.

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