MEDICAL UNIVERSITY
„PROF. DR. PARASKEV STOYANOV“ VARNA
FACULTY OF MEDICINE
DEPARTMENT OF PSYCHIATRY
AND MEDICAL PSYCHOLOGY

PROSPERITAS VESTRA FINIS NOSTRA!

Gabriela Valentinova Gacheva, MD

FOLLOW-UP OF CONSTANT AND VARIABLE CHARACTERISTICS IN THE ACUTE PHASE AND IN REMISSION IN ADOLESCENT PATIENTS WITH ANOREXIA NERVOSA

DISSERTATION SUMMARY

For the acquisition of the scientific and educational degree **“Doctor”**

Of scientific specialty **“Child psychiatry”**

Research supervisor: Assoc. Prof. Petar Milchev Petrov, MD, PhD, DSc

Varna, 2025

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The dissertation consists of 142 pages and is illustrated with 31 tables, 3 figures and 2 graphics. The bibliographic references include 454 sources, of which 5 are in Cyrillic and 449 are in Latin.

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Thesis materials are available at the Library of Medical University – Varna and online on the University's webpage (mu-varna.bg).

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ABBREVIATIONS

AN – Anorexia nervosa

BMI – Body mass index

ICD-10 - International Classification of Diseases, 10th revision

DSM-V - Diagnostic and Statistical Manual of Mental Disorders, 5th edition

EDI-3 - Eating Disorder Inventory, 3rd version

I. INTRODUCTION

Eating disorders are psychiatric conditions characterized by persistent disturbances in eating behaviours and in body image perception. In 2021, the National Institute of Mental Health reported that approximately 9% of the general population experience an eating disorder. This estimate, considered alongside the concerning increase in incidence among individuals under 15 years of age, underscores the contemporary relevance of eating disorders as a major public health problem.

Among the most prevalent and clinically severe eating disorders in adolescence are anorexia nervosa and bulimia nervosa, both characterized by a pronounced drive for weight loss and maladaptive weight-control behaviours. Notably, the number of diagnosed cases of anorexia nervosa has risen substantially in recent years (J. Linardon, 2022), highlighting its increasing salience within mental health research and practice. These disorders are associated with significant impairment in psychosocial functioning and overall well-being (D. Van Hoeken, H.W. Hoek, 2020), as well as elevated mortality (A.E. van Eeden et al., 2021), which further substantiates the need for systematic investigation of the factors implicated in their onset, maintenance, and course.

The present dissertation focuses specifically on anorexia nervosa as a principal eating disorder. Although diagnostic manuals delineate additional borderline presentations and subtypes of eating pathology, these are beyond the scope of the current study.

Anorexia nervosa is a severe mental disorder characterized by significantly low body weight, an intense fear of weight gain, and a distorted experience of body shape and weight. Over recent decades, heightened scientific and clinical attention has been directed toward this condition due to its increasing prevalence during adolescence and its potentially serious consequences for both physical and mental health. The disorder is linked to numerous medical complications, including endocrine and cardiovascular dysfunction, and it frequently co-occurs with clinically significant psychological difficulties such as anxiety and depressive symptomatology, as well as increased suicidal risk.

The present study examines constant (stable) and variable (changeable) characteristics in adolescents with anorexia nervosa across two clinical states: the active phase of the disorder and remission. In addition to indicators of physical recovery - such as body weight and body mass index (BMI) - the study evaluates psychological change using a validated assessment instrument for eating-disorder-related symptomatology, the Eating Disorder Inventory–3 (EDI-3).

The overarching aim of the dissertation is to provide a comprehensive analysis of the trajectories of physical and psychological change in adolescent patients, with particular emphasis on identifying factors that shape symptom dynamics and therapeutic response. In doing so, the study highlights the importance of an integrated treatment framework that combines medical management with psychotherapeutic interventions. Special attention is devoted to cognitive and psychological mechanisms, given their central role in sustained remission and in patients' longer-term quality of life.

By systematically monitoring transitions from the active phase to remission, the study seeks to contribute to the refinement of therapeutic strategies for anorexia nervosa, with the

ultimate goals of reducing relapse risk and improving long-term outcomes. The dissertation presents an analysis of the collected data, derives the principal conclusions, and synthesizes the main findings of the investigation.

II. AIMS, OBJECTIVES, STUDY CONTINGENT AND RESEARCH METHODOLY

2.1 Aims

1. To examine and analyze the constant (stable) and variable psychological characteristics of adolescents with anorexia nervosa in the acute phase of the disorder and in remission, through the administration of the standardized self-report instrument EDI-3.
2. To substantiate the importance of personalized therapeutic strategies in which, following the restoration of clinical parameters, the therapeutic focus shifts towards long-term psychotherapeutic work on emotional regulation and personality patterns which sustain psychological vulnerability.

2.2 Objectives

1. To conduct an empirical study employing the EDI-3 questionnaire in a clinical sample of adolescents with anorexia nervosa, assessed in the acute phase of the illness and subsequently in remission.
2. To present and justify the applicability of the EDI-3 questionnaire as an instrument for the assessment of psychological characteristics in both phases of the disorder in patients with anorexia nervosa.
3. To perform a comparative statistical analysis of the results obtained in the two phases (acute phase and remission) with the aim of identifying:
    - **Variable characteristics** - indicators that exhibit significant change as a result of therapeutic intervention and transition to remission.
    - **Constant characteristics** - enduring personality or psychological traits that remain relatively stable despite clinical remission.

2.3 Study Contingent

The study includes two groups of adolescent patients diagnosed with anorexia nervosa who sought clinical assistance in the period from October 2020 to October 2024. A two-stage assessment protocol was implemented, whereby patients were evaluated during the acute phase of the disorder and subsequently in remission. Assessments were conducted during hospitalizations at the Child and Adolescent Psychiatry Clinic of University Multiprofile Hospital for Active Treatment “Sveta Marina” in Varna (inpatient and day-care units), as well as in outpatient settings.

The total number of participants is 45, distributed as follows:

- 27 patients in the acute phase of the disorder (mean age: 14.00 years; mean BMI: 14.98);
- 18 patients in remission (mean age: 16.50 years; mean BMI: 19.33).

The contingent consists predominantly of female patients (only one participant is male), which is consistent both with epidemiological data indicating a higher prevalence of anorexia nervosa among adolescent girls and with the characteristics of the clinical population seeking

treatment in routine practice.

The inclusion criteria for participation in the study were as follows:

- A diagnosis of anorexia nervosa according to DSM-5 or ICD-10 criteria;
- Adolescent age;
- Clinically established remission for participants in the second group;
- Informed consent provided by the participants and their parents/legal guardians.

2.4 Research Methodology

The standardized self-report instrument EDI-3 (Eating Disorder Inventory – 3) was employed in the present study. The questionnaire comprises 91 items organized into:

- **12 primary scales** – including three scales specific to eating disorders, namely "Drive for Thinness", "Body Dissatisfaction" and "Bulimia", and nine scales assessing psychological constructs such as "Perfectionism", "Personal Alienation", "Low Self-Esteem", among others;
- **6 composite scales**, which synthesize the primary scales into broader clinical profiles, including "Eating Disorder Risk", "General Psychological Maladjustment", "Overcontrol", and others.

Data collection was carried out at two time points:

1. During the active phase of the disorder, immediately following admission for treatment;
2. In a phase of clinical remission, after restoration of body weight and stabilization of the principal biological and behavioural parameters.

The study was conducted in Varna, at the Child and Adolescent Psychiatry Clinic of UMHAT "St. Marina". The EDI-3 questionnaire could be completed once or twice, depending on the participant's willingness and the phase of the eating disorder (active phase and/or remission) at the time of assessment.

The research method is survey-based and relies on a self-report questionnaire format. The instrument begins with 14 open-ended questions concerning weight dynamics. The standard version consists of 91 items with the following response options: *always, very often, often, sometimes, rarely, or never.* Completion of the questionnaire requires approximately 45 minutes.

Eating Disorder Inventory – Third Version (EDI-3)

(D. Garner, 2004; Bulgarian version: D. Garner, 2020)

The EDI-3 is a self-report instrument designed to assess psychological traits and constructs associated with the onset, development and maintenance of eating disorders, as well as those persisting in the remission phase. The results allow clinicians to identify the risk of an emerging eating disorder (where such risk is present), to plan therapeutic interventions and to evaluate their long-term effectiveness. The questionnaire can be administered at multiple stages to all patients for whom there are indications of eating pathology—from the initial consultation, through the treatment phase, to long-term follow-up.

The most recent version of the EDI incorporates significant improvements that enhance the

quality of the information obtained. Although it is not intended for direct diagnostic use, the EDI-3 assesses a broad spectrum of psychological characteristics associated with the emergence, course and maintenance of eating disorders.

The questionnaire has been translated into Bulgarian and standardized in Bulgaria. This, in addition to its psychometric properties, constituted a major argument for its selection as the principal assessment instrument in the present work. The original version is standardized for individuals aged 13 years and older; however, there is sufficient empirical evidence supporting its use in 11–12-year-olds, with favourable psychometric outcomes. The Bulgarian adaptation is standardized for a non-clinical population of adolescents and adults (whereas the original version includes norms for both clinical and non-clinical populations). Its application to clinical samples and the accumulation of empirical data would, however, permit future standardization for a clinical adolescent population.

The Bulgarian adaptation of the EDI-3 is normed not only for adolescent girls and women but also for boys and men, as preliminary research has demonstrated that concerns related to body shape, achieving low body weight and associated worries are relevant for both sexes in Bulgaria. The instrument is normed for non-clinical adolescents and adults, which facilitates the identification of individuals at elevated risk for eating disorders. For already diagnosed patients, the instrument enables comparison of individual scores with norms derived from a Bulgarian clinical sample, thereby supporting the monitoring of therapeutic progress. The norms encompass individuals aged 10 to 73 years, grouped into adolescents (girls and boys under 18 years of age) and adults (men and women aged 18 and above).

Additional advantages of the EDI-3 include its relatively straightforward administration, brief completion time, the possibility of online administration, the lack of requirement for specialized training for interview-based application, and its alignment with contemporary developments in psychological assessment. Data processing can be carried out electronically, which substantially facilitates analysis, particularly when large volumes of primary data are accumulated.

The EDI-3 consists of 91 items organized into 12 primary scales, comprising 3 eating-disorder-specific scales and 9 general psychological scales that, although not strictly specific to eating disorders, are highly relevant to their psychological context. For the first time, the latest version of the instrument also includes 6 composite scales designed to yield clinically meaningful profiles. In addition to the rating scales, the questionnaire contains a section for patient information, providing data on current weight and BMI, past weight, weight-loss history and other relevant indicators (D. Garner, 2020).

Primary Scales of EDI-3

Eating-disorder-specific scales

• Drive for Thinness (DT)

The construct “Drive for Thinness” is regarded as one of the central characteristics associated with the onset and maintenance of eating-disorder symptomatology in clinical samples. The seven items of this scale assess overinvolvement in restrictive dieting, preoccupations with dieting, and fears of weight gain.

• Bulimia (B)

The “Bulimia” scale evaluates the severity of preoccupation with, and engagement in, episodes of uncontrolled overeating. The eight items assess self-reported cognitions and behaviours consistent with binge eating, including the consumption of large quantities of food in

secret or in response to emotional instability. One item specifically evaluates the inclination to induce vomiting for the purpose of losing weight. Empirical findings indicate that binge eating is relatively common among individuals who do not meet full diagnostic criteria for an eating disorder; however, severe forms of binge eating are typically associated with pronounced psychological distress.

• **Body Dissatisfaction (BD)**

The "Body Dissatisfaction" scale comprises 10 items assessing dissatisfaction with the overall shape and size of body areas that are typically the focus of excessive concern among individuals with eating disorders (e.g. abdomen, thighs, hips, buttocks). Although body dissatisfaction is widespread among young women in Western cultures and cannot, in isolation, be considered diagnostic of an eating disorder, it is nevertheless an important risk factor that contributes to the development and maintenance of excessive weight-control behaviours, which may precipitate eating disorders in more vulnerable individuals. The "Body Dissatisfaction" scale has demonstrated its value as a measure of the body dissatisfaction construct (T. Cash and I. Deagle, 1997).

Psychological scales

• **Low Self-Esteem (LSE)**

The "Low Self-Esteem" scale assesses negative self-evaluation through items addressing feelings of insecurity, inadequacy, ineffectiveness and lack of personal significance. Additional items measure the subjective sense of being unable to achieve personal goals. Many theoretical accounts emphasize low self-esteem as a fundamental factor in the development and maintenance of eating disorders.

• **Personal Alienation (PA)**

Conceptually, the "Personal Alienation" scale overlaps with "Low Self-Esteem", but extends to a broader domain of experiences, including emotional emptiness, loneliness and an inability or unwillingness to achieve self-understanding. Items probe feelings of personal isolation, experiences of loss, as well as concerns regarding others' opinions. They also capture the desire to be someone else and a pervasive sense of loss of control over one's life. The scale corresponds to the paralyzing experiences of emotional emptiness and loneliness described by dynamic authors (H. Bruch, 1973; A. Goodsitt, 1997; M. Strober, 1981). Guidano et al. discuss related concepts within a cognitive framework of "deep cognitive structures" associated with personal identity (Guidano et al., 1983).

• **Interpersonal Insecurity (II)**

The "Interpersonal Insecurity" scale consists of seven items assessing feelings of discomfort and unease in social situations. The focus is on difficulties in expressing one's own thoughts and feelings to others and on the tendency to withdraw socially and isolate oneself.

• **Interpersonal Alienation (IA)**

The "Interpersonal Alienation" scale is composed of seven items evaluating disappointment, distance, estrangement and mistrust in interpersonal relationships. It also reflects a tendency to experience relationships as constraining or entrapping, accompanied by perceptions of being misunderstood and unloved. Elevated scores on this scale are regarded as indicative of disturbed attachment.

• **Interoceptive Deficits (ID)**

The "Interoceptive Deficits" scale comprises 9 items that assess confusion in recognizing and

responding to emotional states. Two principal clusters underlie this scale: “Affective Fear” – involving distress in response to intense emotional states or a perceived lack of control over emotions – and “Affective Confusion” – involving difficulty in adequately identifying emotional experiences. Confusion and distrust in relation to affective and bodily sensations are considered important contributors to the development of eating disorders. Bruch was the first to propose that a “lack of interoceptive awareness” is central to understanding eating disorders (H. Bruch, 1962).

• **Emotional Dysregulation (ED)**

The “Emotional Dysregulation” scale consists of eight items assessing tendencies towards emotional instability, impulsivity, recklessness, anger and self-destructive behaviour. The scale includes two clusters addressing potential problems related to substance misuse—one pertaining to alcohol and one to drugs. Difficulties in impulse and mood regulation, along with self-harming tendencies, are considered markers of poor prognosis in patients with eating disorders. The scale captures emotional characteristics typical of a subgroup of individuals with eating disorders who are regarded as particularly treatment-resistant.

• **Perfectionism (P)**

The “Perfectionism” scale includes six items assessing persistent striving for the highest attainable standards. Perfectionism may be self-oriented, socially prescribed, or both. Self-oriented perfectionism reflects the pursuit of high performance standards that are not necessarily externally imposed, whereas socially prescribed perfectionism reflects adherence to high standards perceived as originating from parents or teachers. Empirical evidence suggests that perfectionism may underpin relentless efforts to control weight, as well as unrealistic aspirations in other domains, and is considered a central factor in the development and maintenance of eating disorders.

• **Asceticism (A)**

The “Asceticism” scale assesses a strong drive toward virtuousness through the pursuit of spiritual ideals such as self-discipline, self-denial, self-limitation, self-sacrifice and control over physiological needs. It also reflects a tendency to seek spiritual perfection through self-restraint at the expense of pleasure, often accompanied by feelings of guilt and shame.

• **Maturity Fears (MF)**

The “Maturity Fears” scale consists of eight items assessing the wish to return to the perceived safety and security of childhood. This construct is considered a key maintaining factor in a subgroup of adolescents whose weight loss is motivated by fears associated with psychobiological and psychosexual maturation and with pubertal hormonal changes. Crisp postulates that the core psychopathology in anorexia nervosa and bulimia nervosa is rooted in fears of psychological, social and biological events associated with an adult body weight. Within this perspective, weight loss becomes a strategy for avoiding the emotional turbulence, conflicts and developmental challenges of adolescence, as it entails a regression to a prepubertal somatic and hormonal state. Patients frequently experience themselves as younger following extreme weight loss, an effect that may be related to changes in hormonal balance in adulthood, the biological substrate of which is the subject of ongoing research (A. Crisp, 1997).

Composite Psychological Scales

• **Eating Disorder Risk Composite (EDRC)**

The “Eating Disorder Risk Composite (EDRC)” is calculated as the sum of the T-scores from

the “Drive for Thinness (DT)”, “Bulimia (B)” and “Body Dissatisfaction (BD)” scales and provides a global index of problems related to eating and weight.

• **Ineffectiveness Composite (IC)**

The “Ineffectiveness Composite (IC)” is derived from the summed T-scores of the “Low Self-Esteem (LSE)” and “Personal Alienation (PA)” scales. These scales are highly correlated (≥ 0.80) in both clinical and normative samples, and their combination improves the reliability of the Ineffectiveness composite, incorporating all items from the original “Ineffectiveness” subscale of EDI-2 together with three items from the “Interpersonal Insecurity” subscale of EDI-2 that also show high correlations. Elevated scores reflect both low self-esteem and a pervasive sense of emotional emptiness, which constitute a fundamental deficit in identity formation.

• **Interpersonal Problems Composite (IPC)**

The “Interpersonal Problems Composite (IPC)” is formed by summing the T-scores of the “Interpersonal Insecurity (II)” and “Interpersonal Alienation (IA)” scales. The two scales are moderately correlated. The IPC reflects the individual’s perception of social relationships as tense, insecure, disappointing, uncomfortable and globally unsatisfactory. Personality characteristics of many patients with eating disorders include social anxiety and insecurity, combined with a pervasive mistrust of relationships. This pattern is indicative of insecure and anxious attachment, which is associated with an unfavourable prognosis in therapeutic relationships. Interpersonal problems are highly relevant to the maintenance of eating-disorder symptoms and constitute a crucial target for intervention.

• **Affective Problems Composite (APC)**

The “Affective Problems Composite (APC)” is computed as the sum of the T-scores from the “Interoceptive Deficits (ID)” and “Emotional Dysregulation (ED)” scales. It evaluates the capacity to identify, understand and respond adequately to emotional states. High scores may reflect difficulties in emotion identification, or responses to emotions characterized by fear, confusion or mistrust. They may also indicate instability in mood regulation, emotional lability, low frustration tolerance, impulsivity, recklessness, anger, self-destructiveness and substance misuse as a means of mood regulation. Difficulties in emotion regulation are considered important maintaining factors in eating disorders and may hinder the implementation and effectiveness of treatment. They are also recognized as negative prognostic indicators.

• **Overcontrol Composite (OC)**

The “Overcontrol Composite (OC)” is based on the summed T-scores from the “Perfectionism (P)” and “Asceticism (A)” scales. Although these scales are only moderately correlated, factor-analytic studies of the psychological scales indicate that they form a particularly coherent cluster. Together they reflect a belief system in which the attainment of high personal standards is imbued with moral value, and virtue is conceptualized in terms of spiritual ideals such as self-discipline, self-denial, self-limitation, self-sacrifice and the acceptance of suffering. Shame constitutes a central linking theme that connects perceived personal weaknesses and physiological needs. These beliefs have historical roots in religious asceticism, which associates spiritual goals with the overcoming of bodily drives and needs. In the context of eating disorders, such beliefs frequently reflect a conviction—often at least at a conscious level—that pleasure or care from others is not deserved.

• **General Psychological Maladjustment Composite (GPMC)**

The “General Psychological Maladjustment Composite (GPMC)” is calculated as the sum of the T-scores on all nine psychological scales. Factor-analytic studies of EDI data in non-clinical samples suggest the presence of two broad factors: one relating to concerns about eating, and another reflecting general psychological maladjustment. Although the aggregation of all

psychological scales into a single composite may be criticized for undermining the multidimensional nature of the instrument, the GPMC may nevertheless possess empirical utility in predicting treatment outcome, characterizing response patterns, or identifying individuals with the highest levels of overall psychopathology.

The EDI-3 can be regarded as one of the most comprehensive self-report instruments for the assessment of eating disorders, providing extensive information not only on symptomatology but also on the psychological traits and constructs involved in the development and maintenance of these conditions. Beyond the restoration and maintenance of normal body weight, in the long term these psychological characteristics constitute the principal target of comprehensive therapeutic interventions in eating disorders. Many of them have already been discussed as risk factors in earlier sections of the present work.

As with other contemporary instruments, the EDI-3 includes three validity scales designed to evaluate the credibility of the obtained responses: "Inconsistency", "Infrequency" and "Negative Impression".

• **Inconsistency (IN)**

The "Inconsistency" scale (IN) comprises 10 item pairs that detect contradictory responses to items with similar content (for example, responding "Always" both to "I think my stomach is too big" and to "I think my stomach is normal").

• **Infrequency (IF)**

The "Infrequency" scale (IF) captures endorsement of extreme response options in the symptomatic direction that occur in fewer than 2% of individuals in the clinical sample (for example, responding "Never" to the item "I trust others").

• **Negative Impression (NI)**

The "Negative Impression" scale (NI) reflects the endorsement of extreme symptomatic responses across items (for example, responding "Always" to the item "I eat without being able to stop"). This scale encompasses all items in the EDI-3 (D. Garner, 2020).

The systematic use of the EDI-3 in consultative and clinical practice with all patients presenting with indications of eating disorders has a clear scientific value: the longitudinal accumulation of data enables the identification of trends and the refinement of conceptual models regarding the onset, development and course of eating disorders in adolescence. In addition to its scientific significance, these findings can substantially inform and support an individualized, case-formulation-based therapeutic approach (P. Petrov, 2022).

For the statistical analysis of the results, the following procedures were employed:

- **Descriptive statistics** – to summarize the demographic and clinical characteristics of the sample;
- **Independent-samples t-test and analysis of variance (ANOVA) -** to evaluate the statistical significance of differences between the two groups across the various EDI-3 scales;
- **Analysis of constant and variable characteristics** - through comparison of mean scores on the primary and composite scales, with the aim of identifying stable and dynamic indicators in the course of the disorder;
- All analyses were performed using the statistical software package **SPSS**.

III. RESULTS AND DISCUSSION

The discussion of the results presented in the analyses of the current study examines changes in clinical indicators and psychological characteristics among patients with anorexia nervosa across two clinical states: the acute phase of the illness and remission. The findings are interpreted in relation to contemporary scientific publications and relevant evidence from the literature.

The total sample comprised 45 participants. The sample was stratified into two groups reflecting different phases of the clinical course of anorexia nervosa:

a) **Acute phase:** This group included 27 participants who, at the time of assessment, were in an active phase of the disorder. This phase is characterized by a low body mass index (BMI) and the presence of prominent cognitive and behavioural symptoms associated with eating-disorder psychopathology.

b) **Remission:** This group comprised 18 participants in whom clinical improvement had been achieved, reflected in the restoration of body weight and BMI, as well as a reduction or clinical deactivation of most symptoms.

Regarding demographic characteristics, nearly all participants in the present study were female, with only one male participant included. This distribution reflects the epidemiological pattern observed in anorexia nervosa. There is broad consensus in the literature that anorexia nervosa occurs substantially more frequently in females, particularly during adolescence and early adulthood. The female-to-male ratio among diagnosed cases has been estimated at approximately 9:1 (J. Hudson et al., 2007; FR. Smink et al., 2012).

Characteristics of the study population:

Table 5. Demographic and anthropometric characteristics of participants (acute phase)

	N	Minimum	Maximum	Mean	Std. Deviation
Age	27	12	17	14.00	1.414
Weight	27	27.8	60.0	39.826	8.1715
BMI	27	11.42	23.73	14.9833	2.77839
Valid N (listwise)	27				

a. Phase = Acute

Acute phase (N = 27)

- **Age:** The mean age of participants was 14.00 years (SD = 1.41), ranging from 12 to 17 years.
- **Weight:** Mean body weight was 39.83 kg (SD = 8.17), ranging from 27.8 to 60.0 kg.
- **Body mass index (BMI):** Mean BMI was 14.98 (SD = 2.78), with a minimum of 11.42 and a maximum of 23.73.

In the acute-phase sample, the mean age was 14.00 years (SD = 1.41; 12–17), which corresponds to the well-documented peak onset of anorexia nervosa in early adolescence, around 15 years of age (A. Ayrolles et al., 2024). Mean body weight was 39.83 kg (SD = 8.17; 27.8–60.0), and mean BMI was 14.98 (SD = 2.78; 11.42–23.73). This value lies at the boundary between the DSM-5/DSM-5-TR severity specifiers "severe" (15–15.99) and "extreme" (< 15), with the observed minimum BMI of 11.42 clearly meeting the "extreme" category (Diagnostic and Statistical Manual of Mental Disorders, 5th edition; APA, 2022). At the upper end of the range (BMI up to 23.73), cases are included in which substantial weight loss and characteristic psychopathology are present, while current BMI remains within the normative range (M. Vo et al., 2022). This heterogeneity in weight-based indicators is important because it enables the examination of clinical and psychosocial factors that maintain the disorder beyond BMI per se, particularly in light of ongoing debates regarding the limited validity of BMI-only severity specifiers (F. Toppino et al., 2022).

Table 6. Demographic and anthropometric characteristics of participants (remission)

	N	Minimum	Maximum	Mean	Std. Deviation
Age	18	13	21	16.50	2.526
Weight	18	45.0	56.5	51.300	4.5566
BMI	18	18.03	21.34	19.3367	1.21046
Valid N (listwise)	18				

a. Phase = Remission

Remission phase (N = 18)

- **Age:** The mean age of participants was 16.50 years (SD = 2.53), ranging from 13 to 21 years. As expected, the mean age of the remission sample is higher, given the study methodology (patients are assessed first in the active phase and only subsequently in remission).
- **Weight:** Mean weight increases to 51.30 kg (SD = 4.56), ranging from 45.0 to 56.5 kg.
- **Body mass index (BMI):** BMI also increases to a mean value of 19.34 (SD = 1.21), which falls within the normal range according to WHO criteria for adolescents.

In the remission sample (N = 18), the mean age was 16.50 years (SD = 2.53; 13–21), which is expected to be higher than in the acute phase due to the follow-up design of the study. Descriptive statistics indicated substantial differences in key parameters such as weight and BMI. Mean weight in the acute phase was 39.83 kg, whereas in remission it increased to 51.3 kg. The between-group difference in weight exceeded 10 kilograms (M = 11.374 kg), representing a clinically meaningful change of more than 25% of the initial body weight. It should be reiterated that the present work concerns a clinical population. These findings constitute an important indicator of the effectiveness of the applied treatment and of physical recovery, and they are consistent with criteria reported in other studies for successful weight restoration in the treatment of anorexia nervosa. BMI also differed markedly, with a mean of 14.98 in the acute phase and a mean of 19.34 in remission, which is a key marker of improvement beyond critical somatic thresholds associated with anorexia nervosa. Comparable patterns have been confirmed in numerous clinical investigations and are widely used as core indicators in the evaluation of recovery in this disorder.

Remission in anorexia nervosa is defined as a period in which symptoms are substantially reduced or absent, and patients achieve normalization of body weight and eating behaviour alongside improved psychological functioning. From a clinical perspective, remission is typically divided into two categories:

- **Partial remission:**
  - Body weight is no longer below the diagnostic threshold for anorexia nervosa; however, some cognitive and emotional characteristics associated with the disorder persist, such as fear of weight gain or distorted body-image perception.
- **Full remission:**
  - Weight has been restored to normative limits (typically BMI ≥ 18.5 kg/m² or ≥ 85% of expected weight-for-age/sex) for a sustained period (at least 12 months).
  - There are no significant disturbances in eating- and weight-related behaviours.
  - Social and functional functioning has been restored (education, work, social contacts).
  - There is no pathological fear of weight gain or distorted perception of body image.
  - Menstrual cycle has been restored in women (if it had been disrupted).

This definition is consistent with the diagnostic criteria of the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th edition; APA, 2013) and with recommendations in the academic literature (S. Khalsa et al., 2017; S. Wonderlich et al., 2020).

To establish whether there is a statistically significant difference between participants in the acute phase of anorexia nervosa and those in remission with respect to body weight and BMI, an analysis of variance (ANOVA) was conducted. The variance analysis indicated that between-group differences were statistically significant for both weight and BMI.

Table 7. Weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1421.867	1	1421.867	29.267	.000
Within Groups	2089.072	43	48.583		
Total	3510.939	44			

The result indicates a statistically significant difference between the two groups in body weight ($p < .001$), suggesting that participants in remission have significantly higher weight compared with those in the acute phase.

Table 8. BMI

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	204.676	1	204.676	39.009	.000
Within Groups	225.614	43	5.247		
Total	430.290	44			

The analysis once again reveals a significant difference between the two phases in BMI ($p < .001$), consistent with expectations insofar as recovery in remission entails normalization of body weight.

Particular attention should be paid to the minimum BMI observed in the acute-phase sample (11.42), a value that necessitates intensive care and treatment; unfortunately, such cases have not been exceptional in recent years. It should also be noted that the minimum age in the acute-phase sample was 12 years. Across time, the age of onset has decreased (H. Steinhausen et al., 2015). Data derived from observed trends in clinical work with adolescents with eating disorders and their families at the Child and Adolescent Psychiatry Clinic of St. Marina University Hospital (UMHAT "St. Marina") indicate that, over 22 years of psychiatric practice and more than 100 treated patients, the mean age of female patients treated at the clinic has decreased by at least 1.5 years over the last decade. Over the past 5–6 years, the age of onset has continued to decline. Ten years ago, onset before the age of 14 was an exception; at present, 12- and 13-year-old girls treated in inpatient settings are increasingly the rule (P. M. Petrov, 2022).

Descriptive statistics regarding weight in the two samples:

The descriptive analysis covers key weight-related indicators of participants across the two phases of anorexia nervosa—acute phase and remission. Four variables were analyzed: highest attained weight, lowest attained weight, desired weight, and intentional weight loss (in kilograms).

Table 9. Descriptive statistics for body weight in the acute phase

	N	Minimum	Maximum	Mean	Std. Deviation
Highest attained weight	27	42.00	79.00	55.1407	9.25682
Lowest attained weight	27	24.00	59.00	38.4593	9.22598
Desired weight	27	39.00	65.00	44.5741	6.04264
Intentional weight loss (kg)	27	8.00	30.00	15.7741	6.31552
Valid N (listwise)	27				

a. Phase = Acute

Acute phase (N = 27)

- **Highest weight:** The mean value was 55.14 kg (SD = 9.26), ranging from 42 to 79 kg.
- **Lowest weight:** Participants reported a mean weight of 38.46 kg (SD = 9.23), with a minimum of 24 kg and a maximum of 59 kg.
- **Desired weight:** The mean value is 44.57 kg (SD = 6.04), which is below the actual highest attained weight for all participants.
- **Intentional weight loss:** The mean value of deliberate weight reduction was 15.77 kg (SD = 6.32), ranging from 8 to 30 kg.

Table 10. Descriptive statistics for body weight in remission

	N	Minimum	Maximum	Mean	Std. Deviation
Highest attained weight	18	48.00	65.00	55.4444	5.61743
Lowest attained weight	18	26.00	47.00	36.7444	6.88137
Desired weight	18	45.00	57.00	51.4444	4.44869
Intentional weight loss (kg)	18	10.00	30.00	17.1111	6.85041
Valid N (listwise)	18				

a. Phase = Remission

Remission phase (N = 18)

- **Highest weight:** The mean value is close to that in the acute phase - 55.44 kg (SD = 5.62) -with lower variability (48-65 kg).
- **Lowest weight:** Mean 36.74 kg (SD = 6.88), slightly lower than in the acute phase, but within a narrower range (26-47 kg).
- **Desired weight:** The mean value increases substantially to 51.44 kg (SD = 4.45), reflecting a more realistic and healthier body perception.
- **Intentional weight loss:** Mean deliberate weight reduction was 17.11 kg (SD = 6.85), ranging from 10 to 30 kg.

Table 11. Desired weight

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	509.781	1	509.781	17.048	.000
Within Groups	1285.796	43	29.902		
Total	1795.578	44			

The result indicates that the difference in desired weight between the two groups is statistically significant ($p < .001$).

The data indicate that participants in both groups experienced substantial weight loss; however, in remission, a higher desired weight and less variability at the extremes of body weight were observed. This may be interpreted as a favourable indicator of the restoration of more realistic body self-perception and a reduction in pathological preoccupation with weight. It should be borne in mind that the EDI-3 is a self-report instrument. In this context, it is important to highlight the self-reported desired weight, which was significantly higher in the remission group.

Another important consideration is longitudinal monitoring during treatment using the Eating Disorder Inventory (EDI-3). The lowest achieved weight in the acute phase is not invariably the key indicator, as it is a function of premorbid weight. It is entirely possible that a higher absolute weight in the acute phase may reflect a larger percentage loss relative to pre-illness weight. In cases with premorbid overweight, substantial weight reduction may occur while BMI remains within the normative range, yet all other diagnostic criteria for anorexia nervosa are present.

The EDI-3 consists of 91 items; scales and constructs are derived that characterize different aspects of eating disorders; these are discussed below in this chapter. The total score may be considered only an approximate indicator; nevertheless, it reflects the direction of change.

Table 12. Means and standard deviations of the total EDI-3 score in participants with anorexia nervosa in the acute phase (N = 27)

	N	Minimum	Maximum	Mean	Std. Deviation
Total EDI-3 score	27	43	270	147.67	59.363
Valid N (listwise)	27				

a. Phase = Acute

Table 13. Means and standard deviations of the total EDI-3 score in participants in remission (N = 18)

	N	Minimum	Maximum	Mean	Std. Deviation
Total EDI-3 score	18	27	229	96.56	64.110
Valid N (listwise)	18				

a. Phase = Remission

The presented data include the total scale score, which provides an overall indication of symptom severity in the participants.

The data show a reduction in the total EDI-3 score among participants in remission. This applies to the mean value as well as to the minimum and maximum scores. Lower scores indicate attenuation of symptomatology, including reduced body-image disturbance, anxiety, perfectionism, and controlling eating behaviours. This decrease is consistent with clinical criteria for remission, which presume meaningful improvement not only in somatic indices, but also in psychological attitudes and behaviours assessed by instruments such as the EDI-3.

Mean EDI-3 values across the two study phases

The following tables present mean scores for the individual EDI-3 scales and constructs in the acute phase and in remission. Marked differences are observed relative to data reported in studies associated with the standardization of the instrument. This is attributable primarily to the homogeneity of the present sample (only patients with anorexia nervosa; patients with other eating disorders were not included). In the U.S. version of the EDI-3 for adolescent clinical populations, patients with anorexia nervosa constitute less than 50% of the sample. In the Bulgarian version of the instrument, there is no standardization for an adolescent clinical population. For these reasons, raw scores are used in the statistical analyses of the present data.

Table 14. Mean values on EDI-3 scales in participants in the acute phase

	N	Minimum	Maximum	Mean	Std. Deviation
"Drive for Thinness"	27	3	28	16.26	7.969
"Body Dissatisfaction"	27	59	90	76.22	8.419
"Maturity Fears"	27	2	31	17.74	7.166
"Bulimia"	27	0	19	4.19	4.650
"Interoceptive Deficits"	27	0	34	16.22	9.525
"Low Self-Esteem"	27	0	23	9.93	7.646
"Perfectionism"	27	0	22	13.11	5.740
"Interpersonal Insecurity"	27	0	27	11.52	7.293
"Interpersonal Alienation"	27	0	22	10.78	6.429
"Personal Alienation"	27	1	25	10.56	6.399
"Emotional Dysregulation"	27	0	18	7.30	5.290
"Asceticism"	27	1	18	7.67	4.438
"Eating Disorder Risk"	27	62	132	96.67	17.231
"Ineffectiveness"	27	1	47	20.48	13.323
"Interpersonal Problems"	27	0	49	22.30	12.996
"Affective Problems"	27	0	47	23.52	13.726
"Overcontrol"	27	5	37	20.78	8.276
"General Psychological Maladjustment"	27	28	201	104.81	45.398
Valid N (listwise)	27				

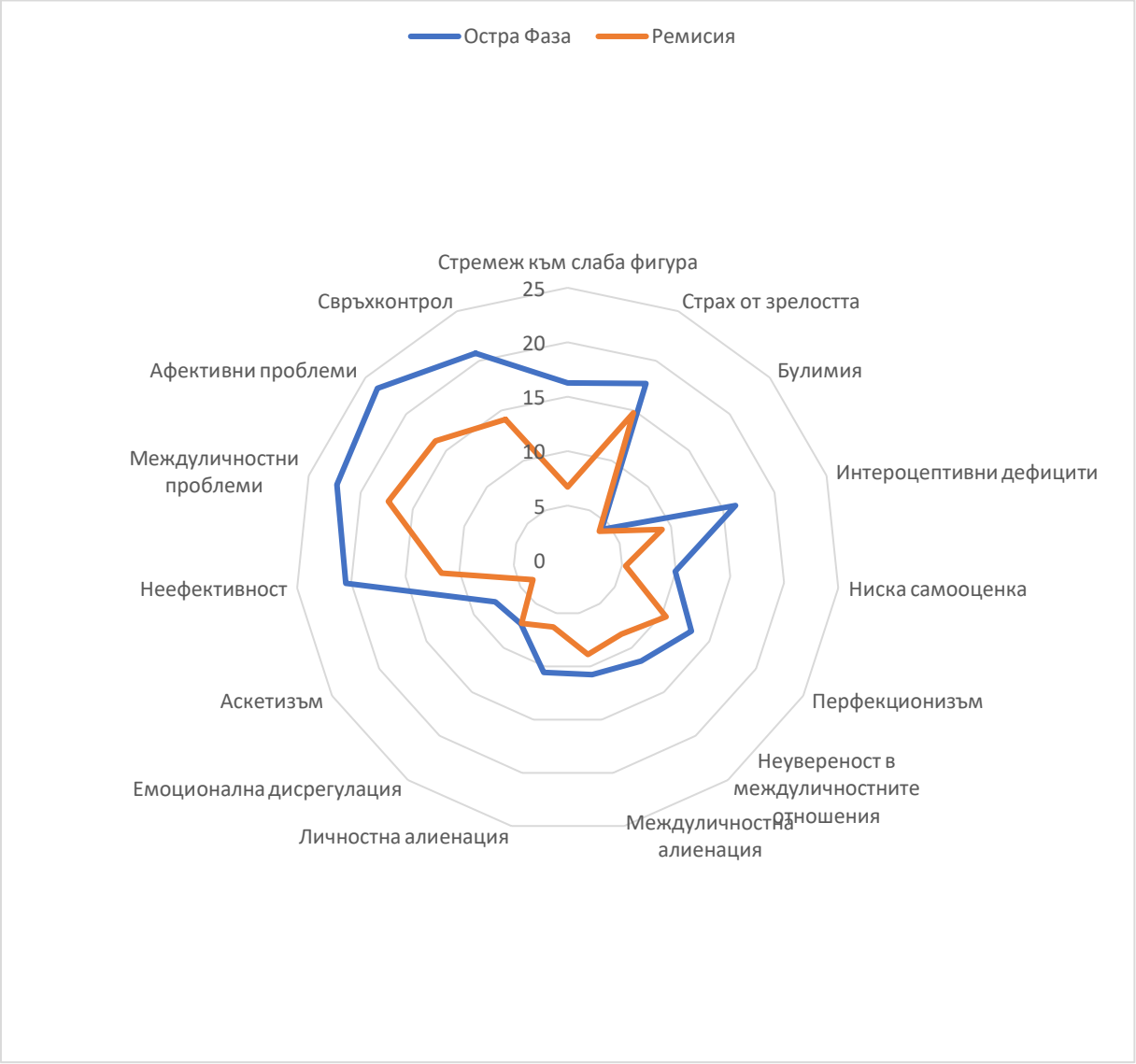
a. Phase = Acute

Table 15. Mean values on EDI-3 scales in participants in remission

	N	Minimum	Maximum	Mean	Std. Deviation
"Drive for Thinness"	18	0	27	6.67	8.650
"Body Dissatisfaction"	18	60	89	68.67	8.203
"Maturity Fears"	18	4	26	14.78	7.833
"Bulimia"	18	0	32	3.89	10.249
"Interoceptive Deficits"	18	0	32	9.11	10.610
"Low Self-Esteem"	18	0	9	5.33	2.521
"Perfectionism"	18	7	19	10.44	3.568
"Interpersonal Insecurity"	18	0	16	8.44	5.762
"Interpersonal Alienation"	18	0	20	8.89	7.003
"Personal Alienation"	18	0	15	6.33	5.760
"Emotional Dysregulation"	18	0	15	7.22	4.989
"Asceticism"	18	0	9	3.67	3.218
"Eating Disorder Risk"	18	60	148	79.22	26.170
"Ineffectiveness"	18	0	24	11.67	8.059
"Interpersonal Problems"	18	4	32	17.33	11.407
"Affective Problems"	18	0	47	16.33	14.463
"Overcontrol"	18	9	24	14.11	4.910
"General Psychological Maladjustment"	18	26	138	74.22	40.815
Valid N (listwise)	18				

a. Phase = Remission

Figure 1. Change in mean EDI-3 scores.

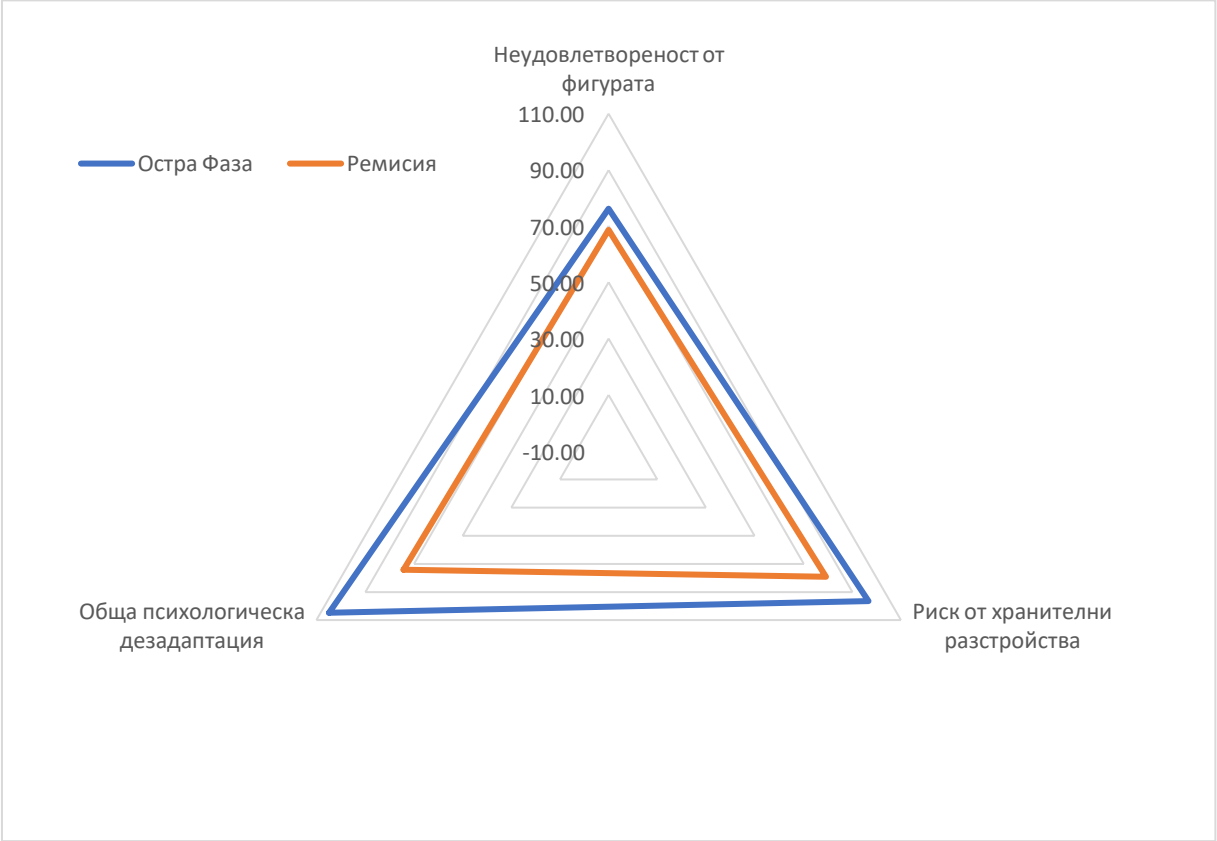


Even without further analysis, the very low scores on the Bulimia scale are notable both in the acute phase and in remission. This again reflects the fact that the investigated sample includes patients diagnosed exclusively with anorexia nervosa.

The Emotional Dysregulation scale is the only measure for which the difference is not only non-significant, but for which no difference is observed between the acute phase and remission. Two explanations are most plausible. First, emotional dysregulation may represent a comparatively stable characteristic relative to other assessed domains. Second, the Emotional Dysregulation scale assesses potential problems related to substance misuse, difficulty regulating impulses and mood, and self-harm. Given the sample size (a relatively small and homogeneous group), it is possible that the cohort did not include a sufficient number of patients with difficulties in these areas. This likely contributes to the relatively low overall scores on this scale in both groups. This stable characteristic (Emotional Dysregulation) is evaluated later in the present work as an important prognostic factor for BMI in remission.

The remaining three key scales and composites are presented in a separate figure due to the substantial differences in mean values.

Figure 2. Change in the indices "Body Dissatisfaction", "General Psychological Maladjustment", and "Eating Disorder Risk"



Despite differences in the magnitude of change across these three indicators (Body Dissatisfaction, General Psychological Maladjustment, and Eating Disorder Risk), all three exhibit statistically significant between-phase differences. To a considerable extent, they delineate the immediate risk profile for eating-disorder pathology. Following treatment and the attainment of remission, values are significantly lower. The General Psychological Maladjustment construct represents the sum of scores across all psychological scales of the EDI-3.

Beyond the between-phase differences noted above, the pronounced reduction in mean scores on the Low Self-Esteem, Ineffectiveness, and General Psychological Maladjustment scales is noteworthy. This pattern suggests not only attenuation of symptoms related to body image and eating behaviour, but also substantial improvement in overall psychological functioning. It is also important to note that, despite the observed improvement, some scales remain elevated in remission (e.g., Perfectionism and Interpersonal Insecurity), indicating that certain personality and cognitive characteristics may persist even after clinical improvement. At a conceptual level, these findings support a multidimensional model of anorexia nervosa that includes personality and affective aspects.

A sample of patients with anorexia nervosa in the acute phase and in remission was examined. An independent-samples t-test was conducted to evaluate the significance of differences in mean values between the two samples (acute phase vs. remission) for the indicators "weight" and "BMI". As expected, these differences were highly significant, which in practical terms reflects the effectiveness of the administered treatment.

Table 16. Means and standard deviations of somatic indicators across the two study phases

	Phase	N	Mean	Std. Deviation	Std. Error Mean
Weight	Acute	27	39.826	8.1715	1.5726
	Remission	18	51.300	4.5566	1.0740
BMI	Acute	27	14.9833	2.77839	.53470
	Remission	18	19.3367	1.21046	.28531

Table 17. Comparison of mean weight and body mass index (BMI) between the acute phase and remission (independent-samples t-test)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Weight	Equal variances assumed	3.226	.080	-5.410	43	.000	-11.4741	2.1210	-15.7514	-7.1968
	Equal variances not assumed			-6.025	41.952	.000	-11.4741	1.9044	-15.3173	-7.6308
BMI	Equal variances assumed	6.207	.017	-6.246	43	.000	-4.35333	.69701	-5.75898	-2.94769
	Equal variances not assumed			-7.183	38.179	.000	-4.35333	.60606	-5.58004	-3.12662

The results of the t-test confirmed the hypothesis of statistically significant differences between the two groups with respect to both weight and BMI. In both cases, p-values were below 0.001. Importantly, the effect size indexed by the mean differences was also clinically meaningful—over 11 kg for weight and over 4 BMI points. This underscores the real-world impact of the therapeutic intervention.

The EDI-3 comprises 91 items organized into 12 primary scales, including three eating-disorder–specific scales and nine general psychological scales. The most recent version of the instrument also includes six composite scales that can be used to generate clinically meaningful profiles. Beyond the restoration and maintenance of normal body weight, these psychological traits and constructs constitute the main target of comprehensive therapeutic change in eating disorders over the long term.

The standardization study of the EDI-3 included a relatively small number of adolescents and, moreover, comprised four eating-disorder groups (AN-R, AN-B/P, BN, EDNOS). In the present study, the sample is substantially more homogeneous; this may partly explain the pronounced differences in phase-related change across the various scales and composites between the acute phase and remission.

Table 18. Significance levels for between-phase differences in mean values (ANOVA)

		Sum of Squares	df	Mean Square	F	Sig.
"Drive for Thinness"	Between Groups	993.793	1	993.793	14.619	.000
	Within Groups	2923.185	43	67.981		
	Total	3916.978	44			
"Body Dissatisfaction"	Between Groups	616.533	1	616.533	8.876	.005
	Within Groups	2986.667	43	69.457		
	Total	3603.200	44			
"Maturity Fears"	Between Groups	94.815	1	94.815	1.714	.197
	Within Groups	2378.296	43	55.309		
	Total	2473.111	44			
"Bulimia"	Between Groups	.948	1	.948	.017	.896
	Within Groups	2347.852	43	54.601		
	Total	2348.800	44			
"Interoceptive Deficits"	Between Groups	546.133	1	546.133	5.497	.024
	Within Groups	4272.444	43	99.359		
	Total	4818.578	44			
"Low Self-Esteem"	Between Groups	227.793	1	227.793	6.017	.018
	Within Groups	1627.852	43	37.857		
	Total	1855.644	44			
"Perfectionism"	Between Groups	76.800	1	76.800	3.077	.087
	Within Groups	1073.111	43	24.956		
	Total	1149.911	44			
"Interpersonal Insecurity"	Between Groups	102.059	1	102.059	2.254	.141
	Within Groups	1947.185	43	45.283		

	Total	2049.244	44			
"Interpersonal Alienation"	Between Groups	38.533	1	38.533	.868	.357
	Within Groups	1908.444	43	44.382		
	Total	1946.978	44			
"Personal Alienation"	Between Groups	192.533	1	192.533	5.083	.029
	Within Groups	1628.667	43	37.876		
	Total	1821.200	44			
"Emotional Dysregulation"	Between Groups	.059	1	.059	.002	.963
	Within Groups	1150.741	43	26.761		
	Total	1150.800	44			
"Asceticism"	Between Groups	172.800	1	172.800	10.800	.002
	Within Groups	688.000	43	16.000		
	Total	860.800	44			
"Eating Disorder Risk"	Between Groups	3286.533	1	3286.533	7.298	.010
	Within Groups	19363.111	43	450.305		
	Total	22649.644	44			
"Ineffectiveness"	Between Groups	839.170	1	839.170	6.310	.016
	Within Groups	5718.741	43	132.994		
	Total	6557.911	44			
"Interpersonal Problems"	Between Groups	266.015	1	266.015	1.732	.195
	Within Groups	6603.630	43	153.573		
	Total	6869.644	44			
"Affective Problems"	Between Groups	557.570	1	557.570	2.836	.099
	Within Groups	8454.741	43	196.622		
	Total	9012.311	44			
"Overcontrol"	Between Groups	480.000	1	480.000	9.423	.004
	Within Groups	2190.444	43	50.941		
	Total	2670.444	44			
"General Psychological Maladjustment"	Between Groups	10107.793	1	10107.793	5.307	.026
	Within Groups	81905.185	43	1904.772		
	Total	92012.978	44			

A substantial proportion of the assessed scales and composites did not exhibit statistically significant change between the acute phase of the illness and remission. This makes it possible, albeit speculatively, to outline a personality profile—observable both in the acute phase and in remission—that may confer vulnerability to eating-disorder pathology and become activated under certain circumstances. At the same time, a considerable number of scales and constructs show statistically significant differences in mean values between the acute phase and remission. These are examined in greater detail below, as they describe the change occurring over the course of treatment beyond the purely biological change in weight and BMI. Scales with significant change—such as Drive for Thinness (p = .000), Asceticism (p = .002), Ineffectiveness (p = .016), Overcontrol (p = .004), and General Psychological Maladjustment (p = .026)—reflect domains in which therapy and recovery achieved the clearest effects. This suggests that these constructs may serve as key indicators of positive therapeutic change. The absence of significant differences on scales such as Bulimia, Emotional Dysregulation, or Interpersonal Alienation indicates that these characteristics are either less responsive to short-term treatment or may be less central to this subgroup of patients (restricting-type anorexia). Interpretation, however, should not be reduced to statistical significance alone: clinical significance and the substantive meaning of each scale are equally important. Certain domains may require longer-term intervention or may be linked to deeper personality structures that are relatively resistant to short-term change. Overall, the results highlight both therapeutic efficacy in specific domains and the need for individualized, long-term interventions targeting enduring cognitive–affective patterns in patients with anorexia nervosa.

One of the most important components assessed in the EDI-3 is the Eating Disorder Risk composite, which has very good predictive value with respect to the development of eating-disorder pathology. This composite comprises three scales: Drive for Thinness, Bulimia, and Body Dissatisfaction.

Table 19. Results of the analysis of the significance of differences across EDI-3 scales (independent-samples t-test)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
"Eating Disorder Risk"	Equal variances assumed	.514	.477	2.702	43	.010	17.444	6.457	4.422	30.467
	Equal variances not assumed			2.491	26.784	.019	17.444	7.003	3.069	31.820

"Drive for Thinness"	Equal variances assumed	.030	.863	3.823	43	.000	9.593	2.509	4.533	14.652
	Equal variances not assumed			3.760	34.466	.001	9.593	2.551	4.410	14.775
"Bulimia"	Equal variances assumed	2.890	.096	.132	43	.896	.296	2.248	-4.238	4.831
	Equal variances not assumed			.115	21.717	.909	.296	2.576	-5.050	5.643
Dissatisfaction"	Equal variances assumed	.449	.506	2.979	43	.005	7.556	2.536	2.441	12.670
	Equal variances not assumed			2.995	37.247	.005	7.556	2.523	2.445	12.666

Despite the lack of statistical significance for the Bulimia scale in our sample—an expected finding given that all included participants were diagnosed with anorexia nervosa—it is evident that the other two scales, Drive for Thinness and Body Dissatisfaction, show a very high level of statistical significance for the difference between the acute phase and remission. It should additionally be considered that body dissatisfaction is influenced by weight (as an absolute value) and/or BMI. In the present sample, across the course of treatment, body dissatisfaction decreased significantly despite weight gain. This scale is particularly important in studies of adolescent populations, given that body dissatisfaction is widespread and constitutes a major risk factor for eating-disorder symptoms. Research indicates that more than 80% of adolescent girls frequently “feel fat” (D. Greenfeld et al., 1987).

Drive for Thinness—unsurprisingly included in this construct—showed the highest statistical significance of change (in mean value) between the acute phase and remission in the present sample. Even when considered on its own, Drive for Thinness has been shown to predict the subsequent development of eating disorders in a large number of prospective studies.

Overall, the Eating Disorder Risk composite provides very good information about the immediate risk for disordered eating behaviour, even in our highly homogeneous sample. Given that it also includes the Bulimia scale (not applicable in our cohort), it would be useful in a much broader range of studies in adolescent populations.
It is important to emphasize that the Eating Disorder Risk composite is not merely a diagnostic indicator; it also has high clinical utility for monitoring treatment effects over time. The pronounced decrease in remission reflects a reduction not only in symptoms, but also in the cognitive attitudes that sustain pathological behaviour (D. Garner, 2004). Moreover, the high acute-phase scores on Drive for Thinness and Body Dissatisfaction suggest that these cognitive distortions lie at the core of the disorder. Accordingly, these scales may be used as targeted markers in treatment, particularly within cognitive-behavioural models (C. Fairburn et al., 2003). The present findings confirm that the Eating Disorder Risk composite is highly sensitive to therapeutic change and may serve as an indicator for diagnosis, monitoring, and prevention.

Other EDI-3 psychological scales that show statistically significant change between the acute phase and remission include Interoceptive Deficits, Low Self-Esteem, Personal Alienation, and Asceticism. In line with these changes, significant differences are also observed in the Ineffectiveness, Overcontrol, and General Psychological Maladjustment composites, the latter essentially reflecting the sum of all psychological scales.

The Overcontrol composite consists of the scores from the Perfectionism and Asceticism scales.

The Perfectionism scale comprises six items assessing a persistent striving to meet the highest possible standards. Perfectionism may be "self-oriented," "socially prescribed," or both. Self-oriented perfectionism reflects striving for high performance standards that are not necessarily linked to family or teachers, whereas socially prescribed perfectionism reflects a perceived need to meet high standards tied to expectations of parents and teachers. Research indicates that perfectionism may underlie relentless efforts to control weight as well as unrealistic striving in other life domains, and it has been identified as a major factor in the development and maintenance of eating disorders.

Table 20. Statistical differences between the acute phase and remission on the "Overcontrol" indicator (EDI-3)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
"Overcontrol"	Equal variances assumed	3.733	.060	3.070	43	.004	6.667	2.172	2.287	11.047
	Equal variances not assumed			3.386	42.558	.002	6.667	1.969	2.695	10.638
"Asceticism"	Equal variances assumed	2.361	.132	3.286	43	.002	4.000	1.217	1.545	6.455
	Equal variances not assumed			3.502	42.630	.001	4.000	1.142	1.696	6.304
ecti nism	Equal variances assumed	6.379	.015	1.754	43	.087	2.667	1.520	-.399	5.732

	Equal variances not assumed			1.921	42.855	.061	2.667	1.388	-.134	5.467

The Asceticism scale assesses a strong drive toward virtue through the pursuit of spiritual ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and control over physiological needs. It also captures a tendency to seek spiritual perfection through self-restraint at the expense of pleasure, which is often accompanied by guilt and shame.

Together, they point to both the reward associated with achieving high standards of personal accomplishment and the belief in virtue attained through the pursuit of ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and suffering.

Patients with anorexia nervosa commonly display specific temperamental and personality traits that are often present in childhood, prior to the onset of the eating disorder, and likely create vulnerability to its development. These characteristics include perfectionism, low self-esteem, self-criticism, anxiety, negative emotionality, obsessive behaviours (especially around order, precision, and symmetry), among others. They often persist even after recovery from the eating disorder (M. Anderluch et al., 2009; W. Kaye et al., 2004; A. Wagner et al., 2006; S. Cassin and K. von Ranson, 2005; L. Rachell and L. Lilenfeld, 2011).

In clinical practice, perfectionism is one of the most common personality characteristics observed in patients with anorexia nervosa. The statistical analyses indicate that it is a relatively stable characteristic that does not show a significant change in remission. By contrast, asceticism does show such change and accounts for the significant difference at the level of the overall Overcontrol construct. Historically, perfectionism and asceticism have been associated with the earliest descriptions of eating disorders and have retained their relevance to the present day, even beyond the context of religious asceticism.

Asceticism, in addition to encompassing attitudes of self-discipline and self-denial, is often accompanied by intense experiences of guilt and shame when basic physiological needs are satisfied. This is particularly salient in the context of eating, sexuality, and pleasure. In patients with anorexia nervosa, food intake may be experienced as a moral transgression that triggers self-punitive mechanisms—such as restriction, exhausting physical activity, or even self-harm (K. Vitousek and F. Manke, 1994; H. Bruch, 1978). This tendency toward self-punishment in response to pleasure is frequently observed among patients with a high degree of internal criticism and low self-acceptance. In this sense, asceticism is not merely a personality trait but part of a deeper psychopathology reflecting internal conflicts between desires and moral prohibitions (D. Garner, 2004). Contemporary research suggests that ascetic attitudes may play a central role in maintaining eating-disorder symptoms, particularly in adolescence, when identity and moral structures are still forming. Accordingly, recognizing and psychotherapeutically addressing asceticism - as well as the associated feelings of guilt and self-punishment - represents a key step toward long-term recovery (C. Fairburn et al., 2003; J. Treasure et al., 2010).

The Ineffectiveness composite comprises the scores of the Low Self-Esteem and Personal Alienation scales. These two psychological scales exhibit a very high level of intercorrelation, both in the EDI-3 normative sample and in the present cohort. Low self-esteem, much like perfectionism, is among the characteristics most commonly observed in clinical practice in patients with anorexia nervosa.

The Low Self-Esteem scale includes affect-laden constructs assessing feelings such as insecurity, inadequacy, ineffectiveness, and lack of significance. Most theoretical accounts assume that low self-esteem plays a central role as an etiological and maintaining factor in eating disorders. Fairburn's cognitive-behavioural model conceptualizes self-esteem as overly dependent on body shape and weight. In patients with eating disorders, self-worth is often built entirely on external control and restraint, and failure to adhere to restrictive rules exacerbates low self-esteem and evokes shame and feelings of failure (C. Fairburn et al., 2003). Bruch's classical theory emphasizes deficits in identity and the internal sense of self. Patients frequently report a sense of ineffectiveness, which motivates them to seek value through control of eating and the body. As early as 1978, she further clarified the psychology of anorexia nervosa in the phrases "the relentless pursuit of thinness" and "the paralyzing sense of ineffectiveness that pervades every thought and activity" (H. Bruch, 1978). According to the self-critical vulnerability model, trait self-criticism and low self-esteem are predisposing features for eating disorders, manifesting as persistent internal hatred and a sense of personal inadequacy that maintains pathological behaviour (S. Blatt, 2004).

Empirical studies confirm this association: a meta-analysis by Button and colleagues indicates that low self-esteem precedes symptoms of anorexia and bulimia (E. Button et al., 1997).

In eating disorders, patients with high self-criticism and low self-esteem may become increasingly focused on controlling eating, body shape, and weight in an attempt to approximate an "ideal self" and thereby enhance self-worth. A more recent study found globally lower self-esteem in patients with anorexia nervosa both in the active phase and in remission compared to healthy controls. Additionally, supporting the proposition that disordered eating behaviours may function as an attempt to compensate for chronically low self-esteem, higher self-esteem was observed in the subgroup of patients with the lowest weight. This suggests that when rigid, restrictive eating successfully accomplishes patients' goals, it can temporarily elevate otherwise low self-worth (C. Starrs et al., 2015).

Table 21. Independent-samples t-test results for the components of the Ineffectiveness composite (EDI-3)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
"Ineffectiveness"	Equal variances assumed	6.180	.017	2.512	43	.016	8.815	3.509	1.738	15.892
	Equal variances not assumed			2.763	42.700	.008	8.815	3.191	2.379	15.251

"Personal Alienation"	Equal variances assumed	.042	.838	2.255	43	.029	4.222	1.873	.446	7.999
	Equal variances not assumed			2.303	39.154	.027	4.222	1.833	.515	7.929
"Low Self-Esteem"	Equal variances assumed	41.567	.000	2.453	43	.018	4.593	1.872	.817	8.368
	Equal variances not assumed			2.894	33.794	.007	4.593	1.587	1.367	7.818

The Personal Alienation scale assesses feelings such as emotional emptiness and loneliness, difficulties or lack of self-understanding, and a general sense of loss of control over life events. The Ineffectiveness composite, which includes Low Self-Esteem and Personal Alienation, is a key measure for monitoring the therapeutic process in patients with anorexia nervosa. Later in this work it is shown that it has substantial importance as one of three factors explaining variation in BMI in the acute phase of the disorder.

The clinical significance of the Ineffectiveness composite is particularly high in the context of anorexia nervosa, as it captures the central role of perceived personal inadequacy and inner emptiness within the disorder's psychopathology. On the one hand, as noted above, low self-esteem often precedes eating-related symptoms (K. Vitousek and F. Manke, 1994); on the other hand, it is amplified as the illness becomes chronic. This reinforces a vicious cycle in which feelings of ineffectiveness sustain dysfunctional behaviours, including starvation, control, and perfectionism (H. Bruch, 1978).

The present findings—showing a statistically significant reduction in this composite in remission—suggest that improvement is not limited to somatic indices but also encompasses deeper intrapsychic attitudes. This is particularly important for prognosis, as enduring improvement in self-esteem is associated with reduced relapse risk (C. Fairburn et al., 2003).

Higher levels of Personal Alienation in the acute phase indicate isolation, emotional estrangement, and a diminished sense of control, which makes this construct an important indicator of the need for psychotherapeutic support aimed at restoring inner connectedness, authenticity, and autonomy (D. Garner, 2004; J. Treasure et al., 2010).

The Interoceptive Deficits scale, both as an individual measure and as part of the General Psychological Maladjustment composite, is the last to show a statistically significant change between the acute phase and remission in the present sample.

Table 22. Independent-samples t-test results for the EDI-3 scales “Interoceptive Deficits” and “Low Assertiveness”

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Interoceptive Deficits"	Equal variances assumed	.018	.895	2.344	43	.024	7.111	3.033	.994	13.228
	Equal variances not assumed			2.293	33.795	.028	7.111	3.101	.808	13.414
Psychological Maladjustment"	Equal variances assumed	.108	.744	2.304	43	.026	30.593	13.280	3.810	57.375
	Equal variances not assumed			2.354	39.181	.024	30.593	12.995	4.311	56.874

Interoceptive deficits - conceptualized as difficulty identifying and differentiating bodily and emotional sensations - are a characteristic feature of patients with eating disorders and are frequently linked to dysfunctional affect regulation (C. Fairburn et al., 2003; K. Vitousek and F. Manke, 1994). Confusion in recognizing and responding to different emotional states is closely associated with affective and bodily functioning, which are important factors in the development of eating disorders. Early pioneers in eating-disorder research proposed that a “lack of interoceptive awareness” is key to understanding these conditions.

The two primary clusters of the Interoceptive Deficits scale are Affective Fear - reflecting distress in the face of intense emotional states or a perceived lack of control over emotions—and Affective Confusion—reflecting difficulty adequately identifying emotional states. The reduction of scores on this scale in remission is a sign of increasing psychological integration and the capacity for more authentic contact with oneself and one’s body.

The General Psychological Maladjustment composite represents a summary index of distress encompassing key personality and affective deficits. As noted earlier, this composite reflects the sum of scores across all psychological scales. It cannot be used to evaluate the specificities of each individual case; however, it provides useful information when monitoring treatment effects over time.

Change across the EDI-3 psychological scales and constructs illustrates the complexity of the therapeutic process in patients with anorexia nervosa during treatment. These changes occur

during adolescence, a developmental period in which personality formation is still underway. This may be advantageous, insofar as personality characteristics at this stage retain at least some capacity for change.

The primary indicator monitored in most cases in patients with anorexia nervosa is weight; for greater precision, BMI is used. The relationship between the EDI-3 scales/constructs and BMI differs across the two phases examined in the present sample.

Table 23. Correlations between BMI and EDI-3 scales and composites in the acute phase

		BMI
BMI	Pearson Correlation	1
	Sig. (2-tailed)	
	N	27
"Drive for Thinness"	Pearson Correlation	.343
	Sig. (2-tailed)	.080
	N	27
"Body Dissatisfaction"	Pearson Correlation	.358
	Sig. (2-tailed)	.067
	N	27
"Maturity Fears"	Pearson Correlation	.077
	Sig. (2-tailed)	.702
	N	27
"Bulimia"	Pearson Correlation	.310
	Sig. (2-tailed)	.115
	N	27
"Interoceptive Deficits"	Pearson Correlation	.276
	Sig. (2-tailed)	.164
	N	27
"Low Self-Esteem"	Pearson Correlation	.279
	Sig. (2-tailed)	.159
	N	27

"Perfectionism"	Pearson Correlation	-.211
	Sig. (2-tailed)	.290
	N	27
"Interpersonal Insecurity"	Pearson Correlation	.219
	Sig. (2-tailed)	.272
	N	27
"Interpersonal Alienation"	Pearson Correlation	.238
	Sig. (2-tailed)	.233
	N	27
"Personal Alienation"	Pearson Correlation	-.079
	Sig. (2-tailed)	.695
	N	27
"Emotional Dysregulation"	Pearson Correlation	.024
	Sig. (2-tailed)	.904
	N	27
"Asceticism"	Pearson Correlation	.135
	Sig. (2-tailed)	.503
	N	27
"Eating Disorder Risk"	Pearson Correlation	.417*
	Sig. (2-tailed)	.030
	N	27
"Ineffectiveness"	Pearson Correlation	.122
	Sig. (2-tailed)	.544
	N	27
"Interpersonal Problems"	Pearson Correlation	.240
	Sig. (2-tailed)	.227
	N	27
"Affective Problems"	Pearson Correlation	.201

	Sig. (2-tailed)	.315
	N	27
"Overcontrol"	Pearson Correlation	-.074
	Sig. (2-tailed)	.712
	N	27
"General Psychological Maladjustment"	Pearson Correlation	.164
	Sig. (2-tailed)	.414
	N	27

*. Correlation is significant at the 0.05 level (two-tailed).

**. Correlation is significant at the 0.01 level (two-tailed).

Table 24. Regression of BMI on EDI-3 scales and composites in the acute phase

Model	Variables Entered	Variables Removed	Method
1	"Eating Disorder Risk"	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	"Personal Alienation"	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
3	"Interpersonal Alienation"	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Phase = Acute

b. Dependent variable: BMI

Table 25. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417[b]	.174	.141	2.57506
2	.549[c]	.301	.243	2.41782
3	.700[d]	.490	.423	2.11006

a. Phase = Acute

b. Predictors: (Constant), "Eating Disorder Risk"

c. Predictors: (Constant), "Eating Disorder Risk", "Personal Alienation"

d. Predictors: (Constant), "Eating Disorder Risk", "Personal Alienation", "Interpersonal Alienation"

Table 26. Analysis of variance (ANOVA) for regression models predicting BMI in the acute phase of anorexia nervosa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34.932	1	34.932	5.268	.030[c]
	Residual	165.774	25	6.631		
	Total	200.705	26			
2	Regression	60.405	2	30.203	5.167	.014[d]
	Residual	140.300	24	5.846		
	Total	200.705	26			
3	Regression	98.302	3	32.767	7.360	.001[e]
	Residual	102.404	23	4.452		
	Total	200.705	26			

a. Phase = Acute

b. Dependent variable: BMI

c. Predictors: (Constant), "Eating Disorder Risk"

d. Predictors: (Constant), "Eating Disorder Risk", "Personal Alienation"

e. Predictors: (Constant), "Eating Disorder Risk", "Personal Alienation", "Interpersonal Alienation"

Table 27. Coefficients of regression models for predictors of BMI in the acute phase

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.481	2.876		2.949	.007
	"Eating Disorder Risk"	.067	.029	.417	2.295	.030
2	(Constant)	6.913	2.803		2.466	.021
	"Eating Disorder Risk"	.103	.033	.642	3.181	.004
	"Personal Alienation"	-.183	.088	-.421	-2.087	.048
3	(Constant)	7.600	2.458		3.093	.005
	"Eating Disorder Risk"	.087	.029	.537	2.988	.007
	"Personal Alienation"	-.439	.116	-1.010	-3.771	.001
	"Interpersonal Alienation"	.338	.116	.783	2.917	.008

a. Phase = Acute

b. Dependent variable: BMI

In the acute-phase group, correlational and regression analyses of the relationship between BMI and the EDI-3 indices identified a significant correlation between BMI and only the Eating Disorder Risk construct. Regression analysis, however, indicated predictive value for two additional indicators beyond Eating Disorder Risk—namely Personal Alienation and Interpersonal Alienation—such that the three factors jointly explained approximately half (49%) of the variance in BMI in the sample. Including additional factors in the regression model that do not show significant bivariate correlations with BMI is intended to illustrate that, in a multivariate setting and in interaction with other EDI-3 indices, they may exert a more nuanced predictive role than simple correlation suggests.

Low body weight (and, correspondingly, BMI) in the acute phase is determined by multiple factors, some of which have greater predictive value than others. As expected, in this group the Eating Disorder Risk construct shows a significant correlation and strong predictive value with respect to weight and BMI. More informative are the two other scales for which regression analysis indicates predictive capacity for BMI—Personal Alienation and Interpersonal Alienation.

The Personal Alienation and Interpersonal Alienation scales included in the EDI-3 assess important intra- and interpersonal deficits that are highly relevant for understanding the psychopathology of anorexia nervosa.

In terms of content, the Personal Alienation scale overlaps with Low Self-Esteem, but it also assesses a broader range of experiences such as emotional emptiness, inability or lack of capacity for self-understanding, absence of an internal reference point, low self-acceptance, and fragmentation in the sense of self as a coherent person. Patients often report feeling that they do not know themselves, lack an identity, or are "empty inside" (H. Bruch, 1978; K. Vitousek and F. Manke, 1994). In the acute phase, this manifests as excessive reliance on external reference points—weight, dietary control, and others' evaluations—to maintain a sense of worth. The scale includes items assessing feelings associated with personal isolation, personal loss, and concerns about others' opinions. Items also capture the desire to be someone else and a general sense of losing control over one's life. This construct aligns with the paralyzing feelings of emotional emptiness and loneliness described by several authors (H. Bruch, 1973; A. Goodsitt, 1997; M. Strober, 1981). Guidano and colleagues describe related concepts using a cognitive framework of "deep cognitive structures" linked to personal identity (V. Guidano et al., 1983).

The Interpersonal Alienation scale comprises seven items assessing disappointment, distance, difficulties with emotional closeness, alienation, and lack of trust in interpersonal relationships. A sense of social isolation may be present even when the patient is in an actual relationship or social environment. This may reflect perfectionism, fear of rejection, and limited emotional accessibility. The scale also captures a tendency to feel "trapped" in relationships and to experience misunderstanding or lack of affection from others. A high raw score primarily reflects attachment disturbance. As a result, patients often choose autonomy via restriction as an attempt to regulate the relationship with themselves and with others (D. Garner, 2004).

The interaction between these two scales delineates a particular personality organization in which inner emptiness and external isolation mutually reinforce one another. This can generate a fragile and vulnerable identity, especially in adolescents and young women for whom issues of control and autonomy are particularly salient (J. Treasure et al., 2010). Such a personality profile may explain part of the variance in BMI, insofar as food restriction represents not only a behaviour but also a form of communication and identity—an expression of distress, a need for control, and a means of maintaining boundaries with others.

Table 27. Correlations between BMI and EDI-3 scales and composites in remission

		BMI
BMI	Pearson Correlation	1
	Sig. (2-tailed)	
	N	18
"Drive for Thinness"	Pearson Correlation	.465
	Sig. (2-tailed)	.052
	N	18

"Body Dissatisfaction"	Pearson Correlation	.555*
	Sig. (2-tailed)	.017
	N	18
"Maturity Fears"	Pearson Correlation	.040
	Sig. (2-tailed)	.876
	N	18
"Bulimia"	Pearson Correlation	.260
	Sig. (2-tailed)	.297
	N	18
"Interoceptive Deficits"	Pearson Correlation	.416
	Sig. (2-tailed)	.086
	N	18
"Low Self-Esteem"	Pearson Correlation	.498*
	Sig. (2-tailed)	.036
	N	18
"Perfectionism"	Pearson Correlation	-.507*
	Sig. (2-tailed)	.032
	N	18
"Interpersonal Insecurity"	Pearson Correlation	.082
	Sig. (2-tailed)	.745
	N	18
"Interpersonal Alienation"	Pearson Correlation	.211
	Sig. (2-tailed)	.401

	N	18
"Personal Alienation"	Pearson Correlation	.424
	Sig. (2-tailed)	.080
	N	18
"Emotional Dysregulation"	Pearson Correlation	.772**
	Sig. (2-tailed)	.000
	N	18
"Asceticism"	Pearson Correlation	.027
	Sig. (2-tailed)	.916
	N	18
"Eating Disorder Risk"	Pearson Correlation	.430
	Sig. (2-tailed)	.075
	N	18
"Ineffectiveness"	Pearson Correlation	.459
	Sig. (2-tailed)	.056
	N	18
"Interpersonal Problems"	Pearson Correlation	.171
	Sig. (2-tailed)	.497
	N	18
"Affective Problems"	Pearson Correlation	.571*
	Sig. (2-tailed)	.013
	N	18
"Overcontrol"	Pearson Correlation	-.351

	Sig. (2-tailed)	.154
	N	18
"General Psychological Maladjustment"	Pearson Correlation	.306
	Sig. (2-tailed)	.217
	N	18

*. Correlation is significant at the 0.05 level (two-tailed).

**. Correlation is significant at the 0.01 level (two-tailed).

a. Phase = Remission

Table 28. Regression of BMI on EDI-3 scales and composites in remission

Model	Variables Entered	Variables Removed	Method
1	"Emotional Dysregulation"	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	"Overcontrol"	.	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

Table 29. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.772[b]	.595	.570	.79368
2	.858[c]	.737	.702	.66132

a. Фаза = Ремисия

b. Предиктори: (Constant), "Емоционална дисрегулация"

c. Предиктори: (Constant), "Емоционална дисрегулация", "Свръхконтрол"

a. Phase = Remission

b. Dependent variable: BMI

Table 30. Analysis of variance (ANOVA) for regression models with predictors "Emotional Dysregulation" and "Overcontrol"

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.830	1	14.830	23.543	.000[c]
	Residual	10.079	16	.630		
	Total	24.909	17			
2	Regression	18.349	2	9.174	20.977	.000[d]
	Residual	6.560	15	.437		
	Total	24.909	17			

a. Phase = Remission

b. Dependent variable: BMI

c. Predictors: (Constant), "Emotional Dysregulation"

d. Predictors: (Constant), "Emotional Dysregulation", "Overcontrol"

Table 31. Coefficients of regression models for predictors of BMI in remission

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	17.985	.336		53.583	.000
"Emotional Dysregulation"	.187	.039	.772	4.852	.000
2 (Constant)	19.271	.533		36.160	.000
"Emotional Dysregulation"	.190	.032	.784	5.912	.000
"Overcontrol"	-.093	.033	-.376	-2.836	.013

a. Phase = Remission

b. Dependent variable: BMI

The Emotional Dysregulation scale comprises eight items assessing a tendency toward instability in emotional states, impulsivity, recklessness, anger, and self-destructiveness. Emotional Dysregulation includes difficulties in modulating and expressing emotions, affective lability, and a propensity toward internal tension (K. Vitousek and F. Manke, 1994). This is linked to a need for external control (e.g., through eating behaviour or attaining a particular weight) as a compensatory mechanism in the absence of internal regulation (H. Bruch, 1978). This mechanism likely helps explain why emotional dysregulation is such a strong predictor even in remission: it remains a background risk factor that threatens the stability of recovery (J. Treasure et al., 2010). The scale contains two clusters that assess potential substance misuse - one for alcohol and one for drugs. Difficulties with impulse and mood regulation, as well as a tendency toward self-harm, are considered markers of poor prognosis in patients with eating disorders. Items on the Emotional Dysregulation scale capture affective qualities characteristic of a subgroup of patients with eating disorders who are considered particularly treatment resistant.

In the remission group, correlational and regression analyses of the relationship between BMI and the EDI-3 indices yield a markedly different picture compared with the acute-phase group. Five EDI-3 scales and constructs show significant correlations with BMI: Body Dissatisfaction, Low Self-Esteem, Perfectionism, Emotional Dysregulation, and Affective Problems. When examining predictive (rather than purely correlational) relationships, regression analysis identifies two factors with predictive value for BMI in remission: Emotional Dysregulation and Overcontrol. Together, these two factors account for 73.7% of the variance in BMI. On its own, Emotional Dysregulation accounts for nearly 60% of BMI variance. No indicator in the acute-phase group demonstrates predictive value of this magnitude. In both correlational and regression analyses, the Overcontrol composite is inversely related to BMI, such that higher overcontrol is associated with lower BMI.

These results warrant careful interpretation and are clinically compelling. Indicators such as Body Dissatisfaction, Low Self-Esteem, and Perfectionism show high correlations with BMI—associations that clinicians and laypersons alike commonly link to low weight in eating disorders. Even in the remission sample, mean BMI was 19.34 (i.e., only slightly above the lower bound of the normative range). However, regression analysis in the remission sample indicates that these familiar indicators do not have significant predictive value for BMI in remission. Instead, Emotional Dysregulation and Overcontrol show exceptional predictive value and account for a very large proportion of BMI variance in remission. Perhaps for this reason, the EDI-3 manual identifies these two indices as markers for a subgroup of patients with eating disorders who are particularly treatment-resistant—a point also noted in the instrument's clinical documentation.

The Overcontrol composite is derived from the summed T-scores of the Perfectionism and Asceticism scales. These scales show a moderate intercorrelation; nevertheless, factor analysis of the psychological scales indicates that they form one of the most clearly coherent pairings. Together, they reflect both the perceived reward of meeting high standards of personal achievement and a belief in virtue attained through the pursuit of spiritual ideals such as self-discipline, self-denial, self-restraint, self-sacrifice, and suffering. Overcontrol is associated with perfectionism, low flexibility, difficulty expressing emotions, and a tendency toward suppression. In patients in remission, it is not merely a trait but is often part of a rigid coping style that maintains lower BMI through strict adherence to internal rules and standards (D. Garner, 2004). Shame represents a linking element between perceived personal shortcomings and physiological needs. These beliefs have historical roots in religious asceticism, which ties spiritual goals to the overcoming of physical drives and needs. They may take different forms in eating disorders; nevertheless, they often reflect, at least at a surface level, a belief that pleasure or care from others is not "deserved."

Regression analyses indicate that, in remission, the Emotional Dysregulation scale and the Overcontrol composite have the highest predictive value for BMI, jointly explaining more than 73% of its variance. This is an important clinical finding suggesting that, once acute symptoms subside, deeply ingrained personality characteristics begin to play a dominant role in maintaining low weight (D. Garner, 2004; C. Fairburn et al., 2003).

Distinct personality characteristics appear to determine BMI in the acute phase versus remission. The most salient finding is that, in remission, behavioural symptoms give way to personality mechanisms: whereas the acute phase is characterized by more overt behavioural patterns, remission is shaped to a greater extent by personality characteristics such as emotional instability and excessive control. This supports the need for individualized psychotherapeutic strategies targeting personality-related processes in order to achieve durable recovery.

IV. LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The present dissertation has several methodological limitations that should be taken into account when interpreting the findings and considering their applicability to clinical practice.

First, the single-centre design and the relatively small sample size, combined with a pronounced sex imbalance (only one male participant), restrict opportunities for meaningful subgroup comparisons and limit the generalizability of the conclusions to the broader population of adolescents with anorexia nervosa. Second, the absence of an extended follow-up window precludes definitive conclusions regarding the long-term stability of remission, the temporal dynamics of psychopathological indicators, and the sustained impact of different therapeutic strategies. Collectively, these factors reduce the external validity of the study and warrant caution when extrapolating the results beyond a comparable clinical context and similar organizational conditions of care.

Future research could address these limitations through multicentre studies with larger and more heterogeneous cohorts, improved sex balance, and the inclusion of structured clinical interviews to complement self-report measures. In addition, longitudinal designs with extended follow-up periods would be particularly valuable, as they would enable the identification of factors associated with the maintenance of remission and the risk of relapse. Finally, future intervention studies could test the effectiveness of targeted psychotherapeutic approaches aimed at emotional dysregulation, overcontrol, and perfectionism as potential maintaining mechanisms of the disorder, even after weight restoration and stabilization of clinical indicators.

V. SUMMARY OF FINDINGS

1. A subset of the EDI-3 scales and composites examined in the present study demonstrates substantial sensitivity to changes in patients' clinical status between the acute phase and remission. The statistically significant differences observed on the Drive for Thinness, Asceticism, Ineffectiveness, Overcontrol, and Global Psychological Maladjustment scales indicate domains in which clinical recovery and therapeutic interventions exert the most pronounced effects. The marked reduction in mean scores on Low Self-Esteem, as well as on the Ineffectiveness and Global Psychological Maladjustment composites, suggests not only attenuation of symptoms related to body image and eating behaviour, but also meaningful improvement in overall psychological functioning. Moreover, the decline in Interoceptive Deficits during remission may be interpreted as an indicator of increasing psychological integration and enhanced capacity for more authentic awareness of internal states and bodily experience. Collectively, these findings suggest that these constructs may serve as key indicators of positive treatment-related change and support their utility for both diagnostic purposes and the evaluation of therapeutic effectiveness.
2. Drive for Thinness and Body Dissatisfaction represent central mechanisms in the development and maintenance of anorexia nervosa. For the Global Psychological Maladjustment composite, the Eating Disorder Risk composite, and the Body Dissatisfaction scale, between-phase differences are statistically significant, with substantially lower values following treatment and upon attainment of remission. These characteristics therefore appear particularly suitable for clinical monitoring and treatment evaluation. Notably, Eating Disorder Risk, even within the present highly homogeneous clinical sample, provides informative indices of immediate vulnerability to disordered eating and demonstrates high clinical utility for tracking treatment effects over time. The pronounced decreases observed in remission indicate reductions not only in overt symptomatology but also in the cognitive attitudes and schemas that sustain pathological behaviour.
3. Regression analyses indicate predictive contributions from two additional indicators beyond Eating Disorder Risk, namely Personal Alienation and Interpersonal Alienation, with the three factors together accounting for approximately half (49%) of the variance in BMI within the sample. The inclusion of predictors that do not exhibit significant bivariate correlations with BMI suggests that, within a multivariate framework and in interaction with other EDI-3 indicators, certain variables may exert more nuanced predictive effects than would be apparent from simple correlational associations. These findings underscore the relevance of social and personality-related factors in the development and maintenance of eating disorders.
4. Indicators such as Body Dissatisfaction, Low Self-Esteem, and Perfectionism show close associations with BMI, consistent with the well-documented relationship in the literature between low weight and these constructs in eating disorders. Importantly, even within the remission group, mean BMI remains 19.34 (i.e., only slightly above the lower boundary of the normative range). However, regression analyses conducted within the remission subsample suggest that these indicators do not demonstrate significant

predictive value for BMI among patients in remission.

5. The Emotional Dysregulation scale exhibits the greatest temporal stability and is the only indicator for which no difference is observed between the acute phase and remission. On its own, Emotional Dysregulation accounts for nearly 60% of the variance in BMI, and no other indicator in the acute phase demonstrates comparably high predictive value. This pattern suggests that difficulties in emotion regulation may play a clinically significant role in illness prognosis.
6. In remission, regression results indicate that Emotional Dysregulation and the Overcontrol composite show the highest predictive value for BMI, jointly explaining more than 73% of its variance. This may help to clarify why these two indicators have been proposed as markers of a subgroup of patients with eating disorders who are particularly treatment resistant. Across both correlational and regression analyses, Overcontrol is inversely associated with BMI, such that greater overcontrol corresponds to lower BMI.
7. Certain personality-related characteristics appear relatively stable even after remission has been achieved. Elevated scores during remission on specific scales (e.g., Perfectionism and Interpersonal Insecurity) suggest that some trait-like vulnerabilities may persist despite clinical improvement. Statistical analyses indicate that Perfectionism represents a comparatively enduring characteristic that does not exhibit significant change in remission. These findings support the need for sustained psychological support even in cases of apparently successful treatment. Beyond restoring and maintaining normative body weight, these psychological traits and constructs constitute critical long-term targets of comprehensive therapeutic intervention in eating disorders.

VI. CONCLUSION

The present study achieves its stated objective of differentiating variable and stable characteristics in adolescents with anorexia nervosa through a two-phase assessment design - during the active phase of illness and during remission—using the standardized EDI-3 instrument and appropriate statistical procedures (descriptive statistics, independent-samples t-tests, and ANOVA; analyses conducted in SPSS). This design enables the distinction between indicators that are sensitive to therapeutic change and relatively stable personality-related constructs that may continue to influence the clinical course after weight restoration.

The study included 45 patients, allocated to two groups: 27 in the active phase and 18 in remission. In the acute phase, the mean BMI was 14.98, increasing to 19.33-19.34 in remission, which reflects clinically meaningful somatic recovery and confirms the design's sensitivity to treatment effects. Nearly all participants were female, consistent with the well-documented sex disparity in adolescent eating disorders.

Changes in psychological indicators were broadly congruent with the anthropometric findings. The EDI-3 total score decreased from M=147.67 in the acute phase to M=96.56 in remission, indicating a reduction across a wide range of constructs - from disturbed body experience and high-risk eating-related behaviours to perfectionism and global psychological maladjustment. This decline aligns with the clinical profile of remission, in which improvement is expected across both somatic and psychological parameters.

At the level of scales and composites, statistically significant reductions were observed in core domains closely associated with eating-disorder risk, including Drive for Thinness, Body Dissatisfaction, and the Eating Disorder Risk composite. Concurrently, marked decreases were noted in Low Self-Esteem, Ineffectiveness, and Global Psychological Maladjustment, suggesting that not only symptom-specific features but also selected broader psychological characteristics demonstrate responsiveness to treatment. This pattern is further reflected in phase-based comparisons of mean scores.

At the same time, the analyses identified a set of relatively stable (enduring) constructs. Emotional Dysregulation showed no significant differences between phases and appears to function as a background risk factor associated with a less favourable long-term course. In remission, Emotional Dysregulation and the Overcontrol composite demonstrated high predictive value for BMI variability: together, the two factors accounted for 73.7% of the variance in BMI, with Emotional Dysregulation alone explaining nearly 60%. No comparable pattern emerged in the acute phase, where no indicators with similarly high predictive power were identified. These findings support the proposition that, following weight restoration, enduring personality-related and affective deficits may continue to shape vulnerability to unstable remission.

The correlational analyses further substantiate this interpretation. In remission, BMI was significantly associated with Body Dissatisfaction ($r = .555$; $p = .017$), Low Self-Esteem ($r = .498$; $p = .036$), Perfectionism ($r = –.507$; $p = .032$), Affective Problems ($r = .571$; $p = .013$), and most strongly with Emotional Dysregulation ($r = .772$; $p < .001$). While these results reflect expected links between weight/body image and psychometric indicators, emotional dysregulation and overcontrol emerged as particularly salient determinants of recovery stability during the transition to remission.

The clinical implications are twofold. First, the findings support the practice of prioritizing interventions during the acute phase that target body image disturbance and symptom-specific cognitions/behaviours (e.g., addressing Drive for Thinness and Body Dissatisfaction, and

reducing Eating Disorder Risk), given their pronounced sensitivity across phases. Second, once weight has stabilized in remission, clinical focus should shift toward longer-term strategies aimed at enhancing emotion regulation, addressing overcontrol, and remediating residual self-esteem deficits, considering their prognostic relevance for maintaining therapeutic gains and preventing relapse. This phase-oriented framework is consistent with the psychological logic of the EDI-3 profile changes observed between the two clinical states.

Methodologically, the decision to use raw scores is justified by the absence of validated clinical norms for the local adolescent population and by the homogeneity of the clinical sample (patients with anorexia nervosa only), which limits the applicability of international normative data. This approach preserves the interpretive value of between-phase comparisons within the specific clinical cohort under investigation.

In summary, the identified variable indicators - predominantly those related to body image and other eating-disorder risk factors - appear responsive to treatment and improve in remission. By contrast, the stable constructs - particularly emotional dysregulation and overcontrol - remain key determinants of BMI stability and of the risk for incomplete remission. Overall, the dissertation demonstrates that differentiating these variable factors from the stable factors provides a rationale for personalized therapeutic strategies, wherein, following normalization of clinical indicators, the emphasis shifts to sustained psychotherapeutic work targeting emotion regulation and personality-related patterns that maintain vulnerability.

VII. CONTRIBUTIONS

- The statistically significant differences observed across indicators between the acute phase of illness and remission render these measures suitable for clinical monitoring and therapeutic purposes.
- Several indicators provide highly informative indices of immediate risk for the emergence or persistence of disordered eating behaviours and have substantial clinical utility for longitudinal evaluation of treatment effects.
- Beyond the restoration and maintenance of normative body weight, the psychological traits and constructs described constitute key long-term targets of comprehensive therapeutic intervention in eating disorders.
- These findings underscore the importance of social and personality-related factors in the development and maintenance of eating disorders and support the need for sustained psychological support, even in cases of apparently successful treatment.

VIII. PUBLICATIONS RELATED TO THE DISSERTATION:

1. Gacheva G., Petrov P. *Clinical case of a 16-year-old female patient with anorexia nervosa and an extremely low body mass index.* Bulgarian Journal of Psychiatry. 2022;7(4): 30–35.

2. Gacheva G., Stefanova A. *Etiology, pathogenesis, and triggers for the onset of anorexia nervosa.* VFU [Internet]. 2025 Oct 9 [cited 2025 Oct 20];(24): 351–377.