
IMPACT OF THE COVID-19
PANDEMIC, LOCKDOWN
AND SOCIAL RESTRICTIONS
ON EATING DISORDERS IN
ADOLESCENTS IN GIRONA

Before-and-after observational study

END OF TERM PROJECT

FACULTY OF MEDICINE

JANUARY 2021

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I want to thank Isabel Mitjà for all the help, experience and support she has given me during the whole project. Thanks to Teresa Puig and Rafel Ramos for guiding me in the methodology and for listening to my endless doubts.

I would also like to thank the whole team of the Unitat de Subaguts, for making me feel part of the team and showing me what it is like to work with passion and professionalism.

A special thanks to Glòria Tràfach for making time to answer my questions and for explaining the transversal program of eating disorders.

Finally, I want to thank my family, partner and friends for their encouragement and love.

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1. ABBREVIATIONS

AN	Anorexia nervosa
APA	American Psychiatric Association
ARFID	Avoidant Restrictive Food Intake Disorder
BED	Binge eating disorder
BMI	Body mass index
BN	Bulimia nervosa
CBT	Cognitive behavior therapy
DSM-5	Diagnostic and Statistical Manual of mental disorders, 5th edition
ED	Eating disorder
FBT	Family-based therapy
FD	Feeding disorder
FED	Feeding and eating disorder
ICD-11	International Classification of Diseases, 11th edition
NA	Negative affect
SD	Social distancing
WHO	World Health Organization
XSM	Xarxa de Salut Mental (Mental health network)

2. ABSTRACT

BACKGROUND: Eating disorders (ED) are severe mental illnesses with a significant rate of mortality and complications. These disorders usually affect adolescents, who are in a period that can be considered vulnerable due to the physical, emotional and hormonal changes to which they are exposed. The cause of eating disorders is believed to be multifactorial with many risk factors that can precipitate, trigger or sustain the illness. One of the most important factors is the sociocultural factor, in which the environment and surroundings play an essential role.

The appearance of the coronavirus pandemic has affected in many aspects the normal functioning of society at economic, health and emotional levels. Not only because of the situation of fear and stress that it may cause, but also because social restrictions and distancing measures have modified some lifestyles. This situation could have been a risk factor for the emergence or worsening of eating disorders in the population at risk. Therefore, it is interesting to study what impact the coronavirus pandemic has had on these disorders in the adolescent population.

HYPOTHESIS: The COVID-19 pandemic, lockdown and social restrictions have increased the incidence of ED in the adolescent population of Girona and have caused an exacerbation of these disorders in the adolescents already diagnosed based on the number of hospitalizations.

OBJECTIVES: The main aim of this study is to analyze the impact of the COVID-19 pandemic, lockdown and social restrictions on the incidence of eating disorders in the adolescent population of Girona. The secondary objective is to analyze the impact on the adolescents already diagnosed by measuring the increase in hospitalizations to see if there has been an exacerbation of the disease. Further, the results will be analyzed according to gender, age and type of eating disorder (anorexia nervosa, bulimia nervosa or binge eating disorder).

METHODS: A before-and-after observational study will be performed using clinical health records from the Xarxa de Salut Mental (XSM) of the sanitary region of Girona. The sample will be selected from the adolescent population between 12 and 18 years old of Girona with a non-probabilistic convenience method. The incidence and the number of hospitalizations during the pandemic (pandemic period) will be compared with the last 3 years (pre-pandemic period). The results will be compared according to the covariates of the study: age, gender and type of eating disorder.

Keywords: Eating disorders, COVID-19, adolescence, social restrictions, lockdown.

3. INTRODUCTION

The appearance of the coronavirus in our current society has changed some landscapes and has transformed certain methods of work, study and interaction. Such a contagious virus has rearranged the forms of communication between people to prevent infection and to avoid the collapse of public health.

Society tends to have a routine and customs that allow good development of its activities and responsibilities. These routines are, in reality, a way of organizing life according to stages or periods that build a life project. A well-established routine, if it is changed suddenly, can cause problems at the level of functionality but it can also have repercussions at a psychological level since it is a stressful factor on some occasions. The coronavirus pandemic appeared abruptly and people had to adapt to the new normality, which at times meant a total change in routine and lifestyle.

Adolescents go through an essential period of life where changes predominate at many levels; physical, hormonal, psychological, etc. Family and social environment play a fundamental role. During this stage of life, adolescents seek who they are, what they like; they experience new emotions, discover their sexuality and learn to relate and create friendships or personal relationships.

Social interaction plays a role as important as helping to build personality through the management of emotions and different experiences. Not only are the experiences lived in first person important, but also discovering the others to establish the fears and tastes that we have. Social distance would change this context and even more so during a confinement in which you cannot leave the home and you must stay isolated.

Mental health in these adolescents can be harmed if, in addition to the stressful situation of living in the context of a pandemic, there is also a change in lifestyle, social isolation and many other stressors related to this situation. Isolation brings sadness, loneliness and sometimes anxiety. It can trigger the appearance of a mental disorder or make it worse.

Eating disorders (ED) are frequent psychiatric illnesses of multifactorial origin that occur mainly during adolescence. This study protocol proposes to analyze the impact that the pandemic has had on the incidence and course of ED in the adolescent population.

3.1 EATING DISORDERS IN ADOLESCENTS

3.1.1 DEFINITION

Feeding and eating disorders (FED) are illnesses defined by the American Psychiatric Association (APA) in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) as the persistent disturbance of eating or eating-related behavior resulting in a change in food consumption or absorption and significantly impairs physical health or psychological functioning (1,2).

The World Health Organization (WHO) also defined these disorders in the International Classification of Diseases, 11th edition (ICD-11) in which feeding disorders (FD) involve behavioral disturbances not related to body weight and shape concerns, such as eating non-edible substances or voluntary regurgitation of foods. Eating disorders (ED) instead, involve abnormal eating behavior and preoccupation with food as well as body weight and shape concerns (3).

From a psychopathological point of view, the alteration of the perception of body image, or the overvaluation of the importance of one's thinness as a key to success and acceptance is characteristic. Some patients can admit their thinness but do not show concern about it, nor do they modify their eating pattern to improve their physical condition (4).

Initially, the eating behavior is related to the desire to be thin and the fear of gaining weight. Patients with restrictive behaviors can control their intake while maintaining a regular but insufficient caloric ingestion. On the other hand, patients with purgative behaviors often alternate episodes of fasting with others of overeating, compensating for this loss of control with episodes of self-induced vomiting, use of laxatives, or diuretics (4).

These pathologies are potentially fatal if they are not identified and treated, so their early detection and recognition of risk factors are extremely important (5). The clinical course is episodic with a tendency to relapse and chronicity can last between 4 and 8 years (6).

3.1.2 EPIDEMIOLOGY

ED can appear at any age, although adolescence is a stage with a major risk for these diseases. The highest incidence occurs between the ages of 12 and 18. Unfortunately, these diseases affect progressively younger patients (7–9). The proportion of men with eating disorders is one in nine women (7).

ED is the third most common chronic disease in adolescence after obesity and asthma (10,11). The most common eating disorders are anorexia nervosa, bulimia nervosa and binge-eating disorder (12).

Within their lifetimes, about 8% of western women and 3-3.5% men will meet the criteria for an eating disorder (13,14). In Spain, the latest studies show that the prevalence of ED in the adolescent population is around 4.1-4.5% between the ages of 12 and 21. Specifically, anorexia is around 0.3%, bulimia at 0.8%, and unspecified ED around 3.1% of the female population aged 12 to 21 years (7).

ED have some of the highest morbidity and mortality rates of all mental disorders. Due to these diseases, serious physical illnesses can be triggered and, in extreme cases, they can lead to death. The most common mortality causes being suicide or malnutrition (8). Too often, adolescents with ED grow into adults in whom these disorders persist causing considerable distress to patients, their caregivers, and society (15).

3.1.3 RISK FACTORS

Risk factors are those that facilitate the appearance of ED. They can be individual, family and social factors.

Individual factors:

- **Genetic factors:**
 - The risk is incremented if there is a familiar history of ED.
 - Recent research has identified two specific genes with mutations that have been associated with a major risk of developing ED in families: estrogen-related receptor α (ESRRA) and histone deacetylase 4 (HDAC4) (16,17).
 - The concordance percentages for anorexia nervosa among monozygotic twins are significantly higher than those observed in dizygotic twins (9).
- **Biochemical factors:** abnormal regulation of neurochemical such as 5-Hydroxytryptamine (HT) and serotonin-transporter-linked polymorphic region (5-HTTLPR) haven been closely related with ED (16).
- **Neurological factors:**
 - Disturbances in the central nervous system indicate a significant biological contribution to these illnesses (9).
 - Circadian disruptions were confirmed to be prevalent features in eating disorders (18).
- **Adolescence and puberty:**
 - During adolescence, the personality, self-esteem and social role of the person are in full development and, therefore, individuals are more vulnerable to a social environment in which the pressure for the image is excessively high (19).
 - Puberty involves hormonal, psychological and body changes that facilitate excessive preoccupation with their image. Besides, early puberty and its association to prepubertal obesity carry even more risks due to increases or irregularities in the circulation of sex hormones, especially estrogen (16,17).
- **Psychological factors:**
 - High levels of obsession and anxiety, introversion, insecurity, perfectionism and low self-esteem promote the onset of ED. Body image dissatisfaction is usually the immediate antecedent of abnormal behavior with food (17).
 - Negative affect (NA) such as high levels of stress, guilt, hostility, anger and anxiety is associated with increases in eating disorder symptoms (16).

- Weight loss is viewed as an achievement and sign of willpower and weight gain as an intolerable failure (9).
 - Social pressure to lose weight, social media, the need to be accepted and the concern for a slim aesthetic ideal associated with social, family and professional success could be factors that explain this greater physiological vulnerability to presenting ED in young women, which are more common than in men (7).
- **Gender:** Out of every 10 cases of ED, 9 are women and 1 is a man, so being a woman implies a greater risk of developing an ED (19).

Family factors:

- **Vital events:** Negative life experiences such as the loss of a close relative, a history of sexual abuse or emotional breakdowns (17).
- **Overprotective family environment:** Those families in which communication and family dynamics are excessively rigid, controlling and demanding can influence the development of an ED, especially in those members with greater individual vulnerability, such as adolescent girls (19).
- **Unstructured family environment:** Families in which there is no stable and safe structure have a higher risk of developing an ED in some of the members, especially in those who are individually at higher risk, such as adolescent girls (19).
- **Mental health history:** The literature shows that children of mothers with eating disorders are at greater risk of developing them. Since the mother is going to transmit her eating habits and, at the same time, the children are internalizing values, beliefs, thoughts, obsessions, as well as codes for the construction of body image and acceptance of themselves (20).

Social factors:

- **Vital events:**
 - Difficulties in socializing with friends, classmates or home and school changes can be risk factors (17).
 - Patients with ED present an outstanding vulnerability to certain events of a stressful nature as they do not possess adequate coping resources and they resort to harmful eating behaviors to appease them. The impact of these types of events depends on the effectiveness of the social support network, which, based on its quality, can act as a protective or risk factor (20).
- **Sociocultural factors:**
 - Western societies have an ideal of an excessively thin figure. These cultural characteristics, especially in fashion, mark values that are not always acceptable for all young people and can generate personal beliefs about weight, diet, figure and beauty (17).

- People, especially children and adolescents, who have received criticism and have been the object of ridicule related to their physical appearance may have a greater tendency to develop ED, because they have felt insecure with their image (19).
- **Sports or professions** with the need of very strict control of weight or intakes such as ballet, rhythmic gymnastics, modeling, etc (17). It is generally considered that being a woman, a teenager, and playing a sport with high aesthetic requirements (for example ballet, athletics, synchronized swimming or gymnastics) may be the highest risk profiles for developing an ED (7).
- **Social media:** Existence of web pages that make statements in defense for anorexia and bulimia. These are pages in which different people who suffer from ED get in contact to exchange tricks to lose weight, reinforce pathological behaviors typical of the disease (19).

Other risk factors such as abuse of illegal substances and alcohol (17).

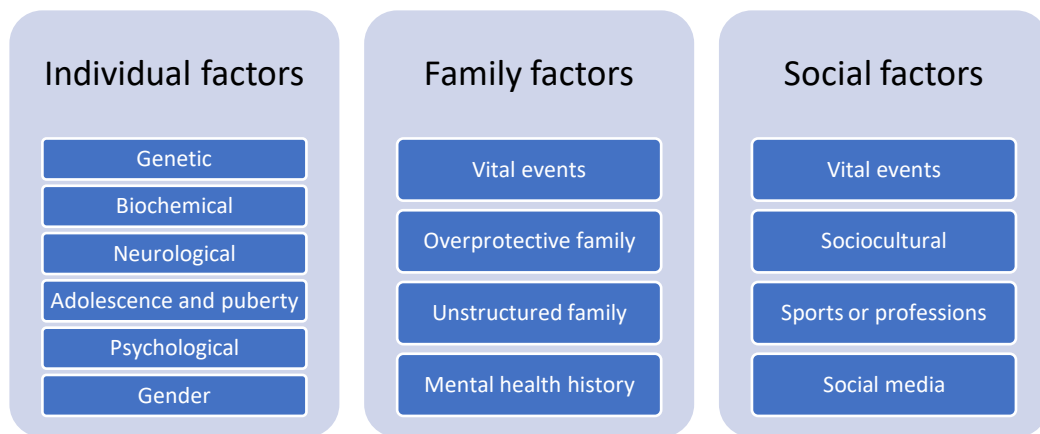


Figure 1: Summary of the risk factors of ED

Risk factors can be classified according to whether they are predisposing, precipitating or maintaining the disease (20):

Table 1: Classification of the risk factors of ED

PREDISPOSING FACTORS	PRECIPITANT FACTORS	MAINTENANCE FACTORS
<ul style="list-style-type: none"> ▪ Individual ▪ Family ▪ Sociocultural 	<ul style="list-style-type: none"> ▪ Vital events ▪ Family conflicts ▪ Physical and emotional changes during puberty and adolescence ▪ Emotional disorders ▪ Illness ▪ Pregnancy 	<ul style="list-style-type: none"> ▪ Rigidity, overprotection, lack of autonomy and concern for appearance ▪ Lack of family or social support ▪ Personality disorders and addictive behaviors ▪ Alcohol and psychoactive substance abuse ▪ Social isolation, emotional conflicts and anxiety ▪ Permanence of family conflicts and social pressure (stereotypes) ▪ The denial of the disease

3.1.4 CLASSIFICATION AND CHARACTERISTICS

DSM-5 classification includes 6 types of FED: pica, rumination disorder, avoidant restrictive food intake disorder (ARFID), anorexia nervosa (AN), bulimia nervosa (BN) and binge eating disorder (BED)(2).

In the DSM-5 classification of ED, there are 3 disorders referred to as typical: AN, BN and BED. Pica, ARFID and rumination disorder were revised and introduced in the DSM-5 as independent diagnostic categories but were previously reserved for children and classified as 'Feeding and Eating Disorders of Infancy or Early Childhood'(9). All the ED types are characterized by an altered behavior towards food ingestion or to control weight.

In addition to these changes, the Disorder Not Otherwise Specified (EDNOS) was recalled as Other Specified Feeding and Eating Disorders (OSFED) that include atypical AN, subthreshold BN and subthreshold BED, purging disorder (PD), night eating syndrome (NES), besides the Unspecified Feeding and Eating Disorders (UFED). These represent cases where behaviors cause clinically significant distress or impairment of functioning but fail to meet full criteria for a feeding or eating disorder (14).

The diagnostic criteria for the different disorders are mutually exclusive so that during a single episode only one of these diagnoses can be assigned. The reason for this approach is that, despite the common behavioral and psychological characteristics, disorders differ substantially in clinical course, outcomes and treatment needs (2).

This study will focus on typical eating disorders since they are the most prevalent and those that usually occur in adolescence.

3.1.4.1 ANOREXIA NERVOSA

DEFINITION: Anorexia nervosa (AN) is defined in the DSM-5 as an inability to maintain a healthy body weight according to age, sex, development or physical health along with an intense fear of gaining weight. Patients may or may not recognize the severity of their illness (9).

Body mass index (BMI) is an indication of the clinical severity of AN. When evaluating children and adolescents, weight must be evaluated in the context of developmental trajectory as well as BMI for age percentile (9).

EPIDEMIOLOGY: AN generally begins during adolescence or early adulthood, in rare occasions begins before puberty or after age 40 (2). The onset of this disorder is usually connected with a stressful life event. The prevalence of AN ranges from 0,5% to 1% among females, with female-male relation of 10/1 (21). There is a higher frequency in western countries and cultures that point out thinness (9).

The course and outcome of anorexia nervosa are highly variable. A meta-analysis of 42 studies revealed the crude mortality rate in AN (due to all causes of death) to be 5.9% in which one in five individuals with AN who dies committed suicide (21).

RISK FACTORS: The groups considered at high risk include those for whom low weight is encouraged (e.g. ballet dancers, athletes, models...) or those with a family history of eating disorders (9,21).

CLINICAL CHARACTERISTICS: Some of the most important features are described in the table below (22):

Table 2: Clinical characteristics of AN

BEHAVIORAL CHARACTERISTICS	PSYCHOLOGICAL CHARACTERISTICS	PHYSIOLOGICAL CHARACTERISTICS
<ul style="list-style-type: none"> ▪ Restrictive diet ▪ Purge conducts ▪ Alterations in the way of eating and rejection of some foods ▪ Hyperactivity or excessive physical exercise ▪ Impulsive behaviors (lie, hide) and self-harm ▪ Social and family isolation 	<ul style="list-style-type: none"> ▪ Excessive worry about fattening ▪ Depression, sadness, irritability, anxiety and ideas of death ▪ Constant erroneous thoughts about food, weight and figure ▪ The impoverishment of fantasy and creativity ▪ Difficulty in concentrating and memory ▪ Perfectionist and self-demanding attitude 	<ul style="list-style-type: none"> ▪ Weight loss: can be progressive, but generally exceeds 25% of the initial weight and can even reach 50% of the normal weight for age ▪ Amenorrhea (loss of menstruation): it can be related to psychological factors or related to weight loss, physical hyperactivity and malnutrition. It persists after weight recovery, being the last symptom to disappear ▪ Dizziness, dehydration, hypothermia, bradycardia, anemia and constipation ▪ Hair loss and lanugo (development of abnormal and very fine hair all over the body) ▪ Edema

DIAGNOSIS: The diagnosis of anorexia nervosa is mainly clinical, it is based on the DSM-5 (see in appendix 16.1) and ICD-11 criteria. There is generally some factor that triggers the symptoms, such as grief, emotional breakdown, moving, family separation or conflict.

AN is in partial remission when after meeting all the criteria, the low weight is no longer met, but the fear of gaining weight and altered perception of weight remain. AN is in total remission when none of these criteria are met for a sustained period.

3.1.4.2 BULIMIA NERVOSA

DEFINITION: Bulimia nervosa is defined in DSM-5 by episodes of binge eating in which an individual loses control over eating and consumes an objectively major amount of food and soon after compensates by engaging in behaviors like vomiting, consumption of medications (laxatives, diuretics), fasting or doing excessive exercise that aims to prevent gaining weight.

Loss of control may be described as not being able to stop eating or control the amount of food consumed. Individuals with BN are typically ashamed of their eating problems and try to hide their symptoms. Binge eating usually occurs in secret or as discreetly as possible. Bingeing often continues until the individual feels uncomfortable or even full. The most frequent antecedent of binge eating is negative feeling (9).

Guidelines provided in DSM-5 classified the clinical severity by the average frequency of inappropriate compensatory behaviors per week according to which it may be mild (1-3 episodes), moderate (4-7 episodes), severe (8-13 episodes) and extreme (>14 episodes) (9).

EPIDEMIOLOGY: The prevalence of BN varies between 2% and 4%. In the meta-analysis of 36 studies, a standardized mortality ratio for BN was 1.9% (21).

RISK FACTORS: In addition the general risk factors for ED exposed previously, there is an increased risk of suffering BN if individuals suffered physical or sexual abuse in childhood or had obesity in early pubertal development (9,17).

CLINICAL CHARACTERISTICS: Some of the most important features are described in the table below (22):

Table 3: Clinical characteristics of BN

BEHAVIORAL CHARACTERISTICS	PSYCHOLOGICAL CHARACTERISTICS	PHYSIOLOGICAL CHARACTERISTICS
<ul style="list-style-type: none"> ▪ Obsession with food (binge eating) ▪ Combination of restraint with self-induced vomiting ▪ Abuse of laxatives, diuretics or pills ▪ Eating on the sly ▪ Self-harm 	<ul style="list-style-type: none"> ▪ Emotional instability: fluctuations on the character, they quickly pass from depression to euphoria, from self-demanding to laziness ▪ Irritability, crisis of anguish and ideas of death ▪ Low self-esteem: self-criticism and constant feelings of guilt ▪ Tendency to isolate 	<ul style="list-style-type: none"> ▪ Important oscillations of weight ▪ Irregularity in menstruation ▪ Fatigue and lack of energy ▪ Dizziness and dehydration ▪ Narrowing and diarrhea ▪ Hair loss ▪ Dental enamel erosion ▪ Hypertrophy of the salivary glands (from the strain of vomiting) ▪ Gastritis ▪ Russell’s sign (calluses on the hands due to the fingerprint when introducing the fingers to provoke vomit)

DIAGNOSIS: The diagnosis of BN is mainly clinical, it is based on the DSM-5 (see in appendix 16.1) and ICD-11 criteria. To meet the criteria for BN, the individual must not have a current diagnosis of AN and the commented behaviors must occur at least once a week for 3 months (9).

BN is in partial remission when after all the criteria are met, some persist for a continuous period. BN is in total remission after none of the criteria has been met for a continuous period.

3.1.4.3 BINGE EATING DISORDER

DEFINITION: BED is defined in DSM-5 as recurring bouts of binge eating, at least once a week for three months. Binge eating consists of consuming an objectively large amount of food with the feeling of loss of control. It’s not limited to BED, it’s a behavior seen among others ED.

The minimum severity is based on the frequency of binge eating episodes: Mild (1-3 binges per week), moderate (4-7 binges per week), severe (8-13 binges per week) and extreme (14 or more binges per week) (2).

Binge eating differs from the following concepts (9):

- **Overeating episodes** (OEs): refer to the act of consuming an objectively large amount of food but in the absence of a loss of control.
- **Emotional eating** (EE): consists of eating as a response to an intense emotion (positive or negative).
- **Eating in the absence of hunger** (EAH) it's a form of behavioral disinhibition.

EPIDEMIOLOGY: Prevalence rates for early-onset BED among youth appear to increase with pubertal development and age (9).

RISK FACTORS: BED runs in some families, which could reflect additive genetic influences (9).

CLINICAL CHARACTERISTICS: Some of the most important features are described in the table below (23):

Table 4: Clinical characteristics of BED

BEHAVIORAL CHARACTERISTICS	PSYCHOLOGICAL CHARACTERISTICS	PHYSIOLOGICAL CHARACTERISTICS
<ul style="list-style-type: none"> ▪ Steals or hoards food in strange places ▪ Frequently diets ▪ Frequent checking in the mirror ▪ Creates lifestyle schedules or rituals to make time for binge eating ▪ Disruption in normal eating behaviors, including eating with no planned mealtimes; skipping meals or taking small portions of food at regular meals; engaging in sporadic fasting or repetitive dieting 	<ul style="list-style-type: none"> ▪ Appears uncomfortable eating around others ▪ Fear of eating in public or with others ▪ Shows concern with body weight and shape ▪ Feels lack of control over ability to stop eating ▪ Feeling of disgust, depression or guilt after overeating ▪ Feelings of low-esteem 	<ul style="list-style-type: none"> ▪ Fluctuations in weight ▪ Stomach cramps and other non-specific gastrointestinal complaints (constipation, acid reflux...) ▪ Difficulties concentrating

DIAGNOSIS: The diagnosis of BED is mainly clinical, it is based on the DSM-5 (see in appendix 16.1) and ICD-11 criteria.

BED is in partial remission after all criteria have been previously met and binge eating occurs on average less than one weekly episode over a continuous period. BED is in total remission after all criteria have been previously met and none of the criteria have been met for a continuous period.

Table 5: Summary of the major criteria of ED

	AN	BN	BED
Major criteria	Low weight with significant shape and weight concerns.	Recurrent binge eating and compensatory behaviors with significant shape and weight concerns.	Recurrent binge eating episodes that are associated with at least 3 characteristics like eat large amounts of food, eat faster than normal, eat until feeling unpleasantly full, etc.

3.1.5 DIAGNOSIS OF EATING DISORDERS

The first step is to detect the potential case in primary care by an evaluation and screening for ED. The use of questionnaires adapted and validated in the Spanish population is recommended for the identification of cases (screening) of eating disorders. It is suggested to use the following instruments:

- ED in general: SCOFF from 11 years old ([see in appendix 16.3](#))
- AN: EAT-40 ([see in appendix 16.4](#)), EAT-26 ([see in appendix 16.5](#)) and ChEAT (the last one between 8 and 12 years old).
- BN: BULIT, BULIT-R ([see in appendix 16.6](#)) and BITE ([see in appendix 16.7](#)), all three from 12 or 13 years old.

BITE = Edinburgh Bulimia Research Test, BULIT = Bulimia Test, BULIT-R = Revised version of BULIT, ChEAT = Children's version of the EAT-26, EAT-40 = Questionnaire of attitudes towards food, EAT-26 = Abbreviated version of EAT-40, SCOFF = Sick, Control, One, Fat, Food questionnaire.

If it's a suspicious case of ED, it's necessary to make an initial diagnostic evaluation that includes an interview with the patient and with the parents if it's the case of an adolescent. The interview consists of a complete review of the patient and family history, the actual symptomatology and other important aspects such as the presence of other diseases or mental health problems. ED requires a physical examination measuring the weight, height, body mass index (BMI), blood pressure and heart rate. With a complete clinical history and physical examination, the diagnosis of ED may be established (24,25). It is recommended to follow the diagnostic criteria of the WHO (ICD-11) and the APA (DSM-5 or DSM-5-TR).

To assess any possible medical complication a full blood analysis and electrocardiogram is requested. As well as bone densitometry in the case of an ED of more than one year, absence of menstruation during the last six months in girls and a significant loss of weight in boys. As comorbidity with other mental disorders is common, it is also necessary to examine it.

It is very important to determine if there are conditions that may require hospital admission.

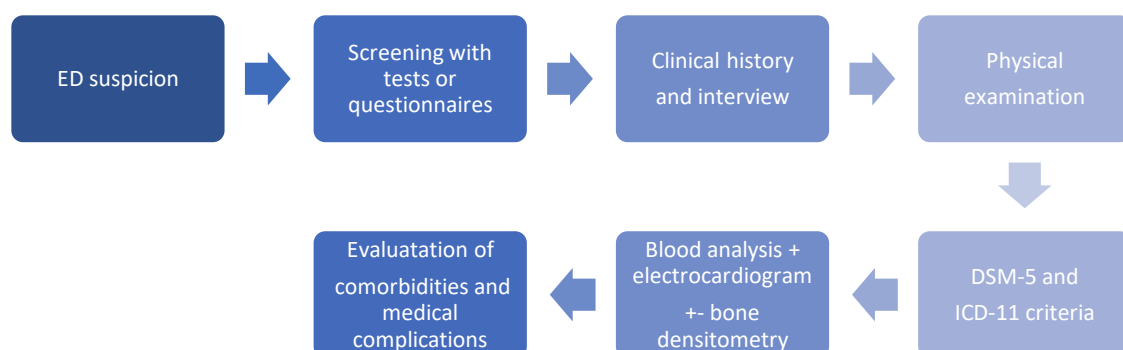


Figure 2: Schematic summary of the diagnostic process of ED

3.1.6 TREATMENT AND MEDICAL MONITORING

Treatment, whether ambulatory or not, always requires management by a multidisciplinary team consisting mainly of psychiatrists, nutritionists, nurses and psychologists trained in the management of eating disorders (24).

The objectives of ED treatments are (26):

- Restore or normalize patient weight and nutritional state to healthy levels in the case of AN.
- To treat physical complications.
- To provide education on healthy, nutritious eating habits.
- To modify or improve prior or acquired dysfunctions due to ED (thoughts, attitudes, inadequate behaviors...) and to increase weight, reduce binge eating and purging, depression...
- To treat psychiatric and physical comorbidities.
- To obtain family support for the patient and provide counseling and therapy when necessary.
- To prevent relapse.
- To treat chronic ED cases, as well as the management of ED in special situations such as pregnancy.

The severity of symptoms and medical complications are the primary factors used to determine the appropriate level of care. Further considerations include the patient's motivation about treatment, psychological functioning, availability of resources and duration of the illness (9). The main care levels are:

- **Outpatient clinic or ambulatory treatment.** In most cases, this is the first line for treatment. The frequency of visits depends on the severity and progression of the disorder, which may be weekly. The therapeutic program attempts to achieve the goals through individual sessions with the responsible therapist (psychologist or psychiatrist), family-oriented sessions, cognitive behavioral therapy groups and parent groups.
- **Day Hospital.** It is the second link in the treatment (in cases coming from outpatient clinics), although it is also the first line for hospital treatment. In addition to having three meals during the time in the day hospital (lunch, afternoon snack and dinner), the psychological treatment is more intensive at this level. Specific cognitive-behavioral therapy groups are formed to work on self-esteem, body image, social skills, emotional control and motivation, as well as other psycho-educational groups. Individual sessions are also maintained with the reference therapist.
- **Hospitalization Area.** Hospital admission only occurs when the outpatient or day hospital treatment does not yield satisfactory results, or also for medical reasons, such as the level of malnutrition or dehydration, associated medical complications, abnormal laboratory or cardiac assessment, arrested growth, severe physiologic instability, refusal of food, failure to gain weight or other serious behavioral changes. Hospital admission is also assessed in case of depressive symptoms with a risk of self-harm. Whenever

possible, treatment is always started on an outpatient basis (unless the clinical situation of the patient indicates otherwise and treatment in the day hospital or hospital admission is resorted to when the evolution is not satisfactory). A nutritional recovery plan is followed throughout the treatment. This plan has particular and specific nutritional objectives for each patient according to personal needs (9).

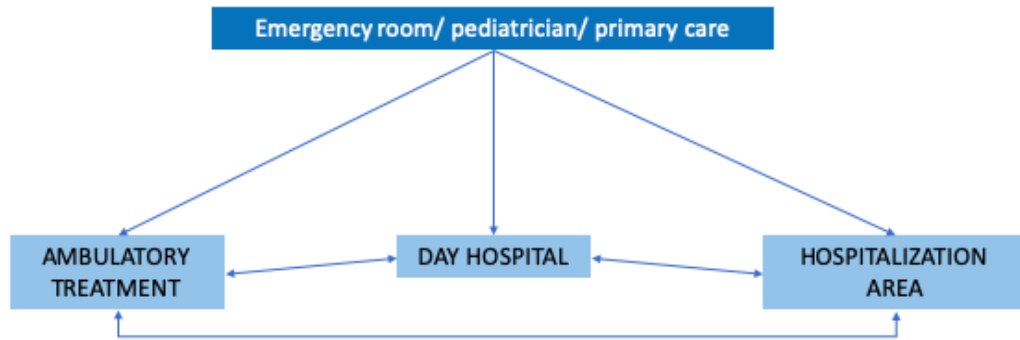


Figure 3: Circuit of treatment and monitoring of ED

In general, through the pediatrician, primary care or the emergency room, patients enter the mental health network either with outpatient treatment, partial hospitalization at the day hospital or directly by being admitted to the hospital. Once in the mental health network, patients may need one level of care or another depending on the clinic situation or complications, among other criteria. Thus, they can go from outpatient treatment to partial or total hospitalization and from there back to outpatient, etc.

Treatment of Anorexia Nervosa:

The different treatment options, which can be combined with each other, are described below:

- **Nutritional rehabilitation and weight restoration:** these are the first and often the most difficult steps towards recovery in AN. The aim is to restore patients to a healthy weight range. The patients may have urges to purge or exercise, therefore meal supervision ensures the patients consume and retain the calories (9). Nutritional support for patients with ED will be selected based on the patient’s degree of malnutrition and collaboration, and always with the psychiatrist’s approval.
- **Psychotherapy:** it addresses the importance of normal eating and may challenge the patient’s concerns about body image and self-evaluation and food-related anxiety. Cognitive-behavioral therapy (CBT) essential elements include psychoeducation, self-monitoring, cognitive restructuring and relaxation (9).
- **Family-based therapy (FBT):** it shows major evidence for the management of AN in adolescents under 19 years who have had the disease for at least 3 years and is recognized as the first line of therapy internationally (5). The FBT has 3 phases that last a total of between 6-12 months (9):

- a. In the first phase, the therapist meets weekly with the family and helps to externalize the illness. The patient must normalize weight and eating behaviors in order to get well. It usually takes 3 months.
 - b. The second phase sessions occur biweekly and begin when the patient starts to eat more independently, has gained weight to a minimum health level and has fewer conflicts with parents. It usually takes 2-3 months.
 - c. Finally, the third phase, which occurs monthly, has the aim to help the patient develop an age-appropriate identity. It begins when the patient is able to maintain 95% of his or her ideal body weight.
- **Pharmacotherapy:** Medication is not recommended as an only or first-line treatment in any ED. The priority is nutritional recovery and the medication can be useful to treat the symptomatology that appears along with the ED, such as depressive, anxiety or obsessive symptoms. It can also be useful in some cases in which certain symptoms make treatment or recovery more difficult, for example, increasing physical activity or episodes of aggressiveness. The most used medication among AN is Fluoxetine (anti-depressant).

Treatment of Bulimia Nervosa:

BN patients appear to be more responsive than AN to psychological and pharmacological treatments which are usually delivered in out-patient settings. High levels of care are reserved for individuals who manifest electrolyte disturbances or other medical complications (9).

The main treatment options, which can be combined with each other, are described below:

- **Psychotherapy:** cognitive behavioral therapy (CBT) has a large evidence base and is generally offered over the course of 3 to 6 months.
- **Family-based therapy (FBT):**
 - a. The first phase consists of 2-3 months of weekly sessions aimed at interrupting binge or purge behaviors and restrictive dieting.
 - b. The second phase consists of biweekly therapy in which parents begin to return control of eating to the patient.
 - c. The third phase consists of monthly sessions that focus on assisting the family and the patient through the development process.
- **Pharmacotherapy:** antidepressants have shown to be helpful in curbing the urges and behaviors of BN, especially Fluoxetine that has been approved by the Food and Drug Administration (FDA) for therapeutic use for BN.

Treatment of Binge Eating Disorder:

The main treatment options, which can be combined with each other, are described below:

- **Cognitive-behavioral therapy (CBT)** can help to better cope with problems that can lead to binge eating episodes, such as negative feelings about the body or a depressed mood. It can also give a better sense of control over behavior and help regulate eating patterns.
- **Interpersonal therapy (IPT)**. This type of therapy focuses on the relationships with other people. The goal is to improve interpersonal skills: how to relate with others, including family, friends, and co-workers. This can help reduce binge eating episodes caused by problematic relationships and unhealthy communication skills.
- **Dialectical behavior therapy (DBT)**. This type of therapy can help learn behavioral skills that help tolerate stress, regulate emotions, and improve relationships with others, all of which can reduce the desire to overconsume.
- **Family-based therapy (FBT)**: When administered to adolescents, family-based treatments were shown to be more effective than a control treatment (supportive psychotherapy) at reducing bulimic symptoms including binge eating. Also a decrease in binge eating behaviors and food preoccupation after a 6-month, family-based treatment for obesity was also found (9).
- **Pharmacotherapy**: medication is always combined with an integrated treatment (psychological treatment with cognitive-behavioral therapy, familiar based therapy and interpersonal psychotherapy (IPT)).
 - a. Fluoxetine at high doses seems to reduce the frequency of binges and vomiting and also improves depressive and anxiety symptoms.
 - b. Topiramate (Topamax) is an anticonvulsant usually used to control seizures, but has also shown to reduce episodes of unrestrained appetite. However, side effects include dizziness, nervousness, drowsiness and difficulty concentrating.

Table 6: Summary of the treatment options for AN, BN and BED

	Nutritional rehabilitation and weight restoration	Psychotherapy	Family-based therapy (FBT)	Pharmacotherapy
AN	+	+ (CBT)	+	+ -
BN	-	+ (CBT)	+	+
BED	-	+ (CBT, IPT and DBT)	+	+

In AN, all treatment options are usually combined. In BN and BED, nutritional rehabilitation is not usually used, however pharmacological treatment is more used because it has more evidence than in AN, always combined with therapy.

MENTAL HEALTH SERVICES IN GIRONA

The Institut d'Assistència Sanitària (IAS) has a decentralized structure of 43 community mental health and addiction care facilities with adult mental health centers, child and youth mental health centers and community rehabilitation services (27). The day hospital in 2018 attended more than 50 adolescents, 65% of whom were girls with an average age of 15.39 years. The 50% within the most frequently diagnosed disorders were severe neurotic disorders (phobias, behavioral and personality disorders with emotional instability) followed by eating disorders in 21% with 90.4% of them being female (27).

Below are described the main characteristics and function of the different levels of care of XSM:

- **CSMIJ (Centres de salut mental infanto-juvenil):** The child and adolescent mental health centers are a free public service that offers specialized care to children and adolescents aged 0 to 18 with mental health problems or addictions from a multidisciplinary and community perspective. The scope of action of the professionals who attend the service focuses on the patient but also on the environment in which the suffering is manifested, whether at school or in the family. They offer psychiatric, psychological, social and nursing assessment with an individual and familiar therapeutic consultation. These centers can be accessed through the specialized care application issued by (27):
 - Pediatrician or primary care family physician
 - Psychiatric admission units (for post-discharge follow-up)
 - Professionals from hospitals in the Girona region
 - Other centers of the Mental Health and Addictions Network
 - Psychopedagogical Advisory Teams (EAP) and The Attention Teams to Children at Risk (EAIA)
 - Juvenile justice
 - The General Directorate of Child and Adolescent Care (DGAIA)
 - The Centers for Development and Early Intervention (CDIAP).
- **Day hospital:** is a partial hospital care unit that combines in a multidimensional way different resources and therapeutic strategies in order to care for adolescents aged 12-18 with mental disorders. The teamwork consists of occupational therapists, nurses, social educators, teachers, psychiatrists and psychologists that ensure a comprehensive approach to all areas of the person to do a biopsychological work. Those patients with active symptoms, with the absence of severely disruptive behaviors, can access it.
- **URPI (Unitat de Referència de psiquiatria infantil i juvenil):** it's a unit of hospitalization for minors who suffer from mental illness. The multidisciplinary team of psychiatrists, psychologists and nurses are specialists in the care of child and adolescent mental health. The application admission is made by the referring professional of the case from the child and adolescent mental health centers or from the adolescent day hospital when the situation requires more intensive care.

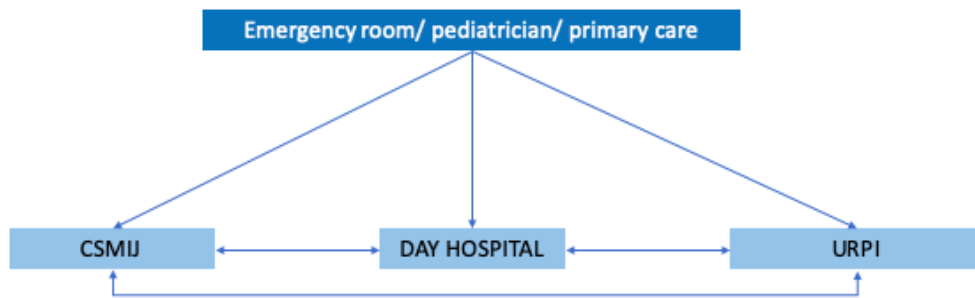


Figure 4: Circuit of treatment of ED in XSM

Transversal program for eating disorders in the health region of Girona

In the mental health region of Girona, there is a specific type of program for eating disorders that differs from the program applied in other regions. This program is coordinated by Glòria Tràfach, a clinical psychologist and psychotherapist who also coordinates the day hospital for adolescents of the mental health network of Girona. It consists of a transversal program in which the patient with an eating disorder is followed and treated by a team specialized in these disorders. Each sector of the health region has a reference psychologist who will treat and follow the patients in the child and youth mental health center (CSMIJ) and also works in the adult mental health center (CSMA).

Following the same scheme explained above, the program is applied at different care levels: the child and youth mental health center (CSMIJ), the adolescent day hospital and the hospitalization in the child and youth psychiatric reference unit (URPI), which is for patients up to 21 years old (just in the case of ED). It is necessary to fulfill some specific criteria to enter and leave each assistance level ([see in appendix 16.2](#)).

Patients who enter in the program are usually referred from pediatrics if they are under 15 or from primary care if they are over 15. The pediatrician or family doctor contacts the reference psychologist in the sector. The psychologist also has a reference psychiatrist in case the patient requires pharmacological treatment. Besides, the psychologist of each sector is coordinated with the school psychologists and psychopedagogical advisory teams (equip d'assessorament i orientació psicopedagògica EAP) and with the parents to have even more transversal treatment.

Once in the program, a specific protocol is followed at each level of care. Patients admitted to URPI will be monitored for meals, water intake, depositions, caloric intake and control of certain areas such as the bathroom to avoid purging behavior. Mealtimes are established, for example, they should not exceed half an hour. Patients with eating disorders come to the day hospital an average of 3 times a week and a specific protocol will be followed as well.

This transversal assistance ensures the continuity of care from primary care to the third level of total hospitalization, favoring the follow-up of the therapeutic process, whatever the level required by the affected person.

3.1.7 PROGNOSIS

Complete psychological and physical recovery rates are generally thought to be around 33% for those with AN and 74% for those with BN (9). Significant comorbidities, prepuberal onset, more severe symptomatology may be additional indicators of poorer outcomes in AN and BN patients. Early recognition and treatment of ED are crucial to a positive prognosis (9).

Even those recovered from ED in some cases continue to live an impaired life after treatment engaging in eating disordered behaviors and having pattern thoughts such as preoccupations or rituals related to food, body image or social isolation (9).

Psychiatric comorbidities are the norm in people with eating disorders (>70%). The most common psychiatric comorbidities include mood and anxiety disorders, neurodevelopmental disorders, alcohol and substance use disorders and personality disorders (8).

Around 20% of individuals with diabetes mellitus develop an eating disorder. Patients with type 1 diabetes are more likely to develop anorexia or bulimia, while patients with type 2 diabetes are more likely to develop the binge eating disorder. This suggests that insulin–glucagon systems may be involved in the predisposition for eating disorders (28). This high prevalence produces an increased risk of diabetic complications and premature death, especially if insulin omission is used to compensate for eating. Bidirectional associations between eating disorders and autoimmune disorders such as celiac and Crohn’s disease have been observed (8).

Rates of mortality are higher than in any other psychiatric illness, with a crude mortality rate of 5% per decade in AN and around 2% per decade in BN (9).

Table 7: Summary of the medical complications of ED

GENERAL MEDICAL COMPLICATIONS OF ED	
Cardiovascular	It is common the appearance of a low heart rate and hypotension. Vomiting and taking laxatives can be associated with a decrease of potassium that could lead to a change in cardiac rhythm and sudden death.
Endocrinological	Includes osteoporosis that may not be reversible with recovery, absence of menstruation, infertility, intolerance to cold and detention of growth.
Gastrointestinal	Constipation and delayed gastric emptying, usually associated with abdominal pain are common. Vomiting can affect the teeth and inflame the salivary glands.
Neuropsychiatric	Irritability, problems in concentration, changes in mood, depressive or obsessive symptoms can be present. In some cases, there can be self-injury or suicide ideation.
Hematological	Malnutrition is associated with anemia and a decrease in white cells and platelets.
Dermatological	Malnutrition can cause hair loss and, in severe cases, fine hair can appear all over the body as well as acne.
Psychological	Self-image, relationships, academic or work performance are often harmed. ED have a significant negative impact on the quality of life.

PROGNOSIS IN ANOREXIA NERVOSA:

Prognosis seems to be better in cases diagnosed during adolescence rather than in adulthood. An individual may recover from one ED and later relapse into another disorder (24).

Among the physiological changes, amenorrhea and abnormalities of vital signs are common. Most of the physiological changes associated with malnutrition are reversible through nutritional rehabilitation. However, some complications such as loss of bone mineral density, are frequently not completely reversible (5).

Medical complications: The most common medical complications are described in the table below (29):

Table 8: Specific medical complications of AN

SPECIFIC MEDICAL COMPLICATIONS OF AN	
Cardiovascular	Up to 80% of adolescents with AN develop some type of cardiovascular complication such as arrhythmias, hypotension, pericardial effusion, mitral valve prolapses, decreased cardiac output and left ventricular size that can lead to bradycardia and systolic dysfunction. The observed structural and functional changes are believed to significantly increase the risk of sudden death.
Endocrinological	<ol style="list-style-type: none"> 1. This disease is accompanied by osteopenia in more than 90% and osteoporosis in 30-40% of women, all this is an effect of hypogonadism, hypoandrogenism, hypoestrogenism, hypercortisolism, calcium and vitamin D deficiency. It is known that the lack of menstruation for more than six months and a BMI of less than 15 kg/m² are factors that decrease bone mineral density. 2. One of the characteristic symptoms of anorexia is amenorrhea, which in 20% of patients is installed prior to losing weight.
Gastrointestinal	<ol style="list-style-type: none"> 1. Between 83% and 94% of patients would meet criteria for at least one functional digestive disorder, with postprandial distress syndrome being the most frequent, with 45%, followed by irritable bowel syndrome with 41%. 2. One of the most serious complications associated with decreased motility and delayed gastric emptying is acute gastric dilation, considered a medical emergency due to the risk of necrosis and perforation. It is characterized by severe abdominal pain, bloating, and the inability to vomit. It can be observed in two situations, in an episode of binge eating or, in the case of anorexia, at the moment of refeeding. 3. Constipation is a frequent symptom present in up to 83% of patients. 4. Liver function can be affected as well. About 75% of patients have a mild increase in liver enzymes.
Dermatological	<p>The skin undergoes major changes in AN caused by:</p> <ol style="list-style-type: none"> 1. Starvation or malnutrition: <ol style="list-style-type: none"> a. In 61% of patients, predominantly frontal alopecia can be observed. b. Appearance of body hair (lanugo). c. Abnormally dry skin (xerosis) due to a decrease in lipids on the skin's surface. d. Acrocyanosis occurs due to vasoconstriction of the arterioles of the skin. e. Acne and itching that increase in severity as the BMI decreases. f. Possible acrodermatitis due to deficiency of zinc, biotin and essential fatty acids. 2. The induction of vomiting: Appearance of the Russell's sign. 3. Taking drugs: photosensitivity secondary to thiazide diuretics. 4. Associated psychiatric pathologies: The scars resulting from self-mutilation behaviors in comorbidity with borderline personality disorder.
Renal	Dehydration, kidney damage due to water restriction or vomiting may develop a loss on renal concentration capacity resulting in increased urinary output.

PROGNOSIS IN BULIMIA NERVOSA:

Long-term studies show that 75% of patients with BN fully recover. However, there is a high percentage of patients that die due to suicide. Physical findings are mainly due to the effects of starvation or vomiting (often similar to anorexia nervosa, but less severe). There is an increase in the frequency of depressive symptoms and depressive and bipolar disorders. The frequency of anxiety symptoms such as fear of social situations and anxiety disorders are also elevated.

Specific medical complications od BN: The most common medical complications are described in the table below (8,29):

Table 9: Specific medical complications of BN

SPECIFIC MEDICAL COMPLICATIONS OF BN	
Endocrinological	Menstrual irregularities or amenorrhea often occur in women with BN. It is not clear whether these changes are related to fluctuations in weight, nutritional deficiencies or emotional distress.
Gastrointestinal	<ol style="list-style-type: none"> 1. When the oral pH reaches a critical value of 5.5, the enamel begins a demineralization process that produces dental erosions. The acid content also affects the pharynx and larynx. It can manifest with pain in the area, dysphonia, dry cough and dysphagia. 2. Persistent vomiting can cause a loss of tone of the gastroesophageal sphincter generating symptoms compatible with gastroesophageal reflux. 3. Constipation or steatorrhea, gastric or duodenal ulcers, pancreatitis, esophageal or gastric erosions or perforation can be present.
Dermatological	Russell's sign is found, which is described as the presence of calluses on the back of the patient's dominant hand. There is also a risk of subconjunctival hemorrhage especially in the context of prolonged arches.
Renal	Vomiting episodes can lead to dehydration and potassium loss. Aldosterone increases the renal absorption of sodium and bicarbonate, what causes hypokalemia, hypochloremia and metabolic alkalosis.

PROGNOSIS IN BINGE EATING DISORDER:

BED is the most common of the ED, with a worldwide prevalence of close to 2%, although the least severe. Overweight and obesity are common comorbidities of BED, which has an estimated prevalence rate between 0.7% and 3% (21).

Medical comorbidities of BED: The most common comorbidities are described in the table below (29):

Table 10: Medical comorbidities in BED

MEDICAL COMORBIDITIES IN BED	
<ul style="list-style-type: none"> ▪ Obesity ▪ Type 2 diabetes ▪ Hypertension ▪ Sleep disorders ▪ Asthma ▪ Complications of pregnancy ▪ Polycystic ovary syndrome 	<ul style="list-style-type: none"> ▪ Metabolic syndrome ▪ Menstrual dysfunction ▪ Dyslipidemias ▪ Intracranial hypertension ▪ Gastrointestinal disorders ▪ Pain disorders (chronic headaches, fibromyalgia)

These findings suggest that patients with BED should be comprehensively evaluated medically.

STIGMA AND ED

Social stigma is a condition, attribute, trait or behavior that causes the carrier person to be included in a social category in which the members are seen as unacceptable or inferior. Stigma related to individuals with ED is frequent among members of the community. Unlike people with other serious mental illnesses, people with ED are not considered dangerous, but they are often held personally responsible and at fault for their condition (30,31).

For a person who suffers from ED, fear of stigmatization forms a barrier to seek for treatment. Stigma may also keep people from disclosing their disorder or symptoms to family and friends and may lead them to seek support from online pro-ED groups instead (31).

Therefore, social stigma can change the prognosis of patients. It is important to educate about these disorders to prevent this from happening.

3.2 ADOLESCENCE

Adolescence is the period of life between childhood and adulthood in which the transition from parental dependence to relative autonomy occurs. It's a period of marked neurobiological changes, increased sex steroids and significant life transitions. Early, middle, and late adolescents are characterized by psychosocial changes related to puberty, identity formation, increased autonomy, development of romantic relationships and changes in family and peer relationships.

In the course of adolescence, individuals acquire the cognitive skills needed to reflect on complex questions about their goals in life and their role in the world (32). The maximum development of executive functions occurs between the ages of 12 and 18 (33).

Adolescents experience a time of development and formation of new mature personality traits. An important characteristic of adolescent behavior is the increased propensity to take risks, which is characterized by seeking rewards rather than avoiding punishment. Adolescents prolong their lives in areas not controlled by the family and are therefore vulnerable. Because they are not yet fully developed, their decision-making ability exposes them to risks that can harm their lives. The severity of these risks depends on the challenges they face and their ability to manage them (34).

During the brain's maturation process, the adolescent can make decisions guided by the amygdala, a structure responsible for emotions and emotional behaviors, which leads to a greater search for rewards because the immature prefrontal cortex still lacks the self-regulatory capacity to properly assess and control impulsivity and risk behaviors (34).

Moreover, adolescence is a period of increased sensitivity to peer influence, social acceptance and rejection and social stimuli (32). Therefore, social interaction and information in social networks become very important in this period. Western culture, among other characteristics, tends to be consumerist and tends to have specific ideals about the body. On social networks, it is common to share photographs or writings about food, diet and exercise. For teenagers who have problems with their bodies, either because they don't like it or because they don't accept it, this type of information can be harmful (34).

Adaptation refers to changing for the better being able to live in a particular environment involving successful transitions. The general belief is that adaptation involves successful transitions. As adolescents experience a multitude of changes, adaptation is an important quality to avoid suffering in the process. However, adaptation requires many skills such as cognitive and linguistic competence, school motivation, ability to manage behavior and flexibility to new situations in order to assimilate to a new social environment (35).

The adolescent crisis is a term that refers to an identity crisis that occurs during adolescence. Erik Erikson was the psychologist who developed the theory that individuals during adolescence would face an identity crisis. This identity crisis would be a time of intense exploration of different ways of looking at oneself. The resolution of the analysis carried out would allow the adolescent to become psychologically healthy in adulthood and able to face the challenges of development (36).

For Erikson, four conditions were needed for a crisis to occur:

- 1) A certain level of cognitive development.
- 2) Puberty needs to have occurred as long as it reveals new levels of maturity and experiences.
- 3) Physical growth resembling adulthood is necessary.
- 4) Youth need to experience cultural pressures that move adolescents toward the need to resolve identity issues.

High levels of stress can compromise adolescent development. It can alter their ability to cope with situations and can lead to pathological coping (37). Poor mental health during adolescence will increase psychological malfunction in the short and long term with consequent personal and economic costs to society (38). The World Health Organization (WHO) insists on remembering that half of mental disorders first appear before the age of 14 and 75% of them start before the age of 18 (39).

The vulnerability in adolescents is a complex concept that involves a state of dependence caused by a certain weakness and the subsequent susceptibility of someone to suffer certain losses or damages. It contains a serial of biological, social, cultural, and epidemiological factors that limit the ability or freedom of individuals to protect themselves from the risks that may be involved in daily behavior (34).

Adolescence, due to all that has already been mentioned, can be considered as a vulnerable period, but at the same time a period of opportunities. Therefore, the family and social environment, the capacity to adapt and external stimuli are key factors for good mental health and development.

3.3 CONTEXTS OF COVID-19 PANDEMIC

3.3.1 COVID-19 PANDEMIC SITUATION

At the end of 2019, a new virus appeared in Wuhan (China), SARS-CoV-2 (COVID-19) or commonly named coronavirus that spread rapidly throughout the world. On the 11th of March 2020, the World Health Organization (WHO) declared the coronavirus disease a global pandemic.

Coronavirus disease is an infectious respiratory disease that is spread primarily through droplets of saliva or through nasal or buccal discharge when an infected person talks, coughs or sneezes, so it's transmitted person to person. These droplets are relatively heavy and do not go very far and fall quickly to the ground, but the droplets can land on objects and surfaces around the person and other people can become infected if they touch those objects and then touch their own eyes, nose or mouth. This way of spreading justifies the need for the distance between people and the use of masks but also the importance to wash hands frequently with soap and water or with alcohol-based disinfectant. Therefore, people must be separated at least a 1-meter distance with their faces covered by masks and without physical contact in order to prevent contagion (40).

A new word, "social distancing", began to be used. Social distancing, likewise "physical distancing", means keeping a safe space between people who do not belong to the same household. It's a method to control infection by doing actions intended to slow the spread by reducing close contact between individuals. Methods include quarantines, travel restrictions, closure of schools, workplaces, cultural places such as cinemas, museums, theatres, etc.

Further, since it is such a contagious virus, people must know what the characteristic symptoms are in order to know how to detect them. The most common symptoms of COVID-19 are fever, dry cough and tiredness. Other less common symptoms include headaches, nasal congestion, conjunctivitis, diarrhea and loss of taste or smell. These symptoms are usually mild and begin gradually and most people recover from the disease without the need for hospital treatment. However about 1 in 5 people who contract COVID-19 develop a severe condition and experience breathing difficulties. Severe illness means that a person with this disease may require hospitalization, intensive care or a ventilator to help breathe or they may even die, which has a huge impact on the public health and socioeconomic system of the country (40).

Older people and those with previous medical conditions such as cardiorespiratory diseases, diabetes, high blood pressure or cancer are more likely to have severe conditions. Withal, anyone can become seriously ill and need this medical care (40). Those infected by coronavirus, whether sick or asymptomatic, to avoid contagion to others have to quarantine at home for approximately two weeks.

Due to the severity of the disease, the number of infected cases and the number of deaths and, in order to avoid the collision of public health, it was decided to implement confinement to the entire population of Spain. This lockdown consisted of not leaving the house unless it was essential or for vital actions such as going shopping, going to essential jobs or walking the dog,

for example. Therefore, the majority of the population would be locked up at home to avoid contagion.

Face-to-face classes were canceled at all educational levels so everything went online. From that time, social interaction was online as well. Fortunately, there are many applications and methods of virtual communication that allow instant contact with distant individuals. In this sense, social life continued but in digital format.

The online connection, however, has its drawbacks. For example, some of the non-verbal speech can be lost. In this sense, meeting friends or making family plans has its limitations. At educational level it can also have its problems, such as a lower capacity of attention or concentration due to distractions or internet connectivity. In addition, by having many of the tasks in online or digital format, the hours of screen consumption increased considerably, resulting in addictive behavior to social networks, among other things. People who were normally unsocial, with these changes could have either increased their sociality or decreased it even more.

Apart from the changes to a virtual format, these social limitations had a possible impact on day-to-day actions. For some people, playing sports, taking walks in nature spaces, meeting friends or visiting family was part of everyday life. With social restrictions, that suddenly changed and absence could affect them emotionally. For adolescents, physical activity is closely associated with school-related activities and sport participation. Nonetheless, schools were closed during COVID-19 pandemic resulting therefore with a possible increase in the risk of sedentary behaviors (41).

Progressively, as the cases decreased, the de-escalation began, in which it was possible to start leaving the house according to schedules and according to age. During this period of supposed return to normality, it was already warned that it would be a “new normality” in which social distancing would have to continue for a longer time. Although in summer you could already make social gatherings there was a limit of people and the mask was still essential.

While public health recommendations and governmental measures help to abate the rate of infection, this limitations and restrictions also could have negative effects. In the first’s studies of Chinese population during the pandemic, there was an increase in the prevalence of anxiety and depression from 4% in 2019 to 20% in 2020 (42).

3.3.2 SOCIAL CONTAINMENT MEASURES

Depending on the epidemiological situation in each region, there were different prohibitions but social containment measures can be classified into 3 main categories (43):

1. **Travel restrictions:** Governments issued international and national travel restriction measures to limit the spread of the virus between countries and among citizens. They consisted of:
 - a. Banning entry from highly infected countries (China, Iran, etc.).
 - b. Closure the national borders and suspend foreign travel.
 - c. Domestic transportation restrictions.

2. **Closure of facilities:** With the aim of limiting the outbreak at the national level, reducing crowds in non-essential places such as bars, restaurants, festivals and prioritizing the safety of children and adolescents by closing schools and institutes. They consisted of:
 - a. Closure of schools.
 - b. Closure of non-essential services and public events.
 - c. Work-from-home order.

3. **Social distancing:** Social distancing measures consisted of staying at home during confinement, for example. They consisted of:
 - a. Restriction from going outside.
 - b. Stay at home order.

The social distancing measures can be distributed into four levels detailed as follows:

- *Level 1:* Lighter level. Warnings against leaving the region.
- *Level 2:* Warnings against leaving the country.
- *Level 3:* Measures to stay at home by region.
- *Level 4:* Homestay measures on a national scale. Everyone in the country should stay home unless they need to go out for essential reasons. This measure is similar to level 3, but on a larger scale in response to a national emergency.

3.3.3 COVID-19 PANDEMIC AND EATING DISORDERS

The current pandemic situation, the lockdown and social restrictions would be associated with a possible increase and worsening of ED. Below are some of the possible explanations, based on the recent articles and studies:

1. COVID-19 pandemic as a stress factor:

- This global pandemic situation can be considered a negative stressful event. Multiple factors influence the extent of the psychological impact of outbreaks including the fear of contagion, uncertainty or future unpredictability, restrictive social measures and media misinformation. Evidence suggests that the majority of individuals tend to change their eating behaviors in stressful situations, altering their caloric intake by about 80% (44).

- Restricted eating is a form of cognitive control to maintain or lose weight. People who maintain rigid rules around their food appear to be less attentive to psychological signals of hunger and satiety, leading to overeating after a prelude. One hypothesis that arises is that people who actively try to restrict their food intake may deplete the cognitive resources necessary to be able to deal with stressors, thus impairing their inhibitory control and therefore increasing the likelihood of overeating. If there is a lack of control over life events, this can lead to desperate and ineffective attempts to control eating by depriving themselves of a particular food and subsequently bingeing (45).

- Thoughts and behaviors related to ED may be used as a dysfunctional method to regain control over the current situation. Concerns of weight, shape, eating may increase in periods when the sense of self-control decreases by external factors such as happening in the present sanitary crisis. In times of instability, ED symptoms may increase as their functions can be providing control or safety (42).
- Stressful life events have been identified as predictive of ED onset, relapse and maintenance (46,47).
- The COVID-19 pandemic is associated with increased psychosocial risk factors, such as isolation, domestic violence, poverty, overcrowding and abuse of new technologies (48).

2. COVID-19 pandemic as a traumatic event:

- Exposure to a traumatic event is associated with ED symptoms, in part, by ED symptoms functioning as a method of coping to avoid traumatic intrusions or as an emotional numbing. ED behaviors may allow individuals to dissociate themselves from negative feelings related to traumatic events and may serve as a method of controlling one's environment through control of their body (49). In some cases, the pandemic could have been a traumatic event by itself or related to the consequences it has had on them.
- Domestic and child abuse during COVID-19 pandemic could have increased, leading to an increased risk factor for mental disorders such as ED (50).

3. COVID-19 lockdown changed routines and lifestyles:

- Lockdown changed some daily habits and routines. For example, it wasn't possible to exercise outside the home, there was less availability of all the foods and brands, there was more evocative information about food and the body on social networks that could cause binges and worsen difficulties with body image (51). Further, bored people are more likely to eat much quantity than in a controlled state (44). And some studies have shown that boredom was a predominant feeling during confinement (52).
- Many patients with ED have rigid and inflexible behaviors with a small range of foods that they want or can eat and thus are usually related to brands. The COVID-19 pandemic has caused in some places restrictions that have resulted in less manufacture or sale of some products. With fewer options to purchase, that can trigger restrictive behaviors (53).
- Productivity pressure associated with more time at home may reinforce perfectionism traits that could increase ED risk (50).

- Studies of confinements in minors within the criminal justice system indicate that social isolation and the lack of environmental stimuli at critical stages of neurological, psychological and social development are related to a significant deterioration in socialization skills; furthermore, this situation has been associated with an increased risk of suicide and a worse social reintegration after the end of it (48).
- Concerns about fitness and increased time spent on social media during lockdown might be a precipitating factor for the development of an ED in vulnerable individuals (54).
- Quarantine evoked anxiety and boredom in some cases and these are risk factors for consuming more food or food with less quality compared to normal living conditions. This change in eating habits combined with less physical activity could lead to gaining weight. Some studies have noticed the changes in eating behaviors increasing the consumption of unhealthy food, eating out of control and snacking more between meals with a higher number of main meals (41).

4. COVID-19 and social distancing (SD) measures:

- Social distancing implies being away from friends, family or the social environment. SD can cause feelings of loneliness and boredom that are hardly tolerable for people and can worsen ED symptoms due to the fact that the individual increases their obsessions and ritual related to food and weight to regain control of the situation (51). Besides, social isolation and loneliness, defined as a feeling of distress arising from perceived deficiencies in social relationships that can result from social distancing measures, can increase negative affect and negatively impact circadian rhythms and self-regulation, thus further increasing the risk of ED symptoms (55).
- An increase in ED concerns may be further promoted by an increased time spent on social media (42). The absence of in-person interactions may lead to an increase in the use of social media. Exposure to stressful media coverage of major disasters has a psychological impact with high distress and disordered eating behaviors (50).
- Due to social distancing, meetings and classes were virtual through video calls, but a negative consequence could be the heightened awareness of bodily self, which could prompt self-criticism that is perceived as harmful to recovery (54).
- The adolescent population, given the situation of forced dependence that has suffered during confinement, has been exposed to specific stress factors that make them potentially more vulnerable (56).

5. COVID-19 pandemic and the psychological impact:

- In a cross-sectional web-based online survey carried out between April 3 and 18th 2020 from the Lebanese population, results showed that the fear of COVID-19 was associated with more eating restraint, weight and shape concerns in the whole sample (44).
- Many young people who are not overweight want to be slimmer. They often try to lose weight by dieting or skipping meals. For some of them, weight became an obsession and with time this can develop into a serious eating disorder (57).
- Isolation is common consequence of AN and lockdown may have exaggerated it (54). Participants with anorexia nervosa of one study reported an increased restriction and fears about being able to find foods consistent with their meal plan. Individuals with bulimia nervosa and binge-eating disorder reported increases in their binge-eating episodes and urge to binge. Respondents noted marked increases in anxiety since 2019 and reported greater concerns about the impact of COVID-19 on their mental health than physical health (46).
- Negative affect (NA), defined as a personality variable that involves the experience of negative emotions and a poor self-concept, is a risk factor for the development of ED. Negative affect usually increases in the prior hours, leading up to binge. This suggests that people may use binge eating to try to alleviate experiences of aversive self-awareness, such as shame and guilt. Despite their apparent similarities, shame and guilt have important conceptual distinctions that entail divergent consequences. For instance, shame is a bad feeling about oneself following a transgression, whereas guilt engages a bad feeling about a behavior. Guilt may be an adaptive and productive emotional experience that advocates engagement in social situations correcting actions in a reparative way. Conversely, shame is generally associated with maladaptive behavior (58).
- COVID-19 has led to disruptions in daily life with an increase of uncertainty about social, financial, physical and psychological consequences that can conduce to anxiety, eating disorder pathology and compulsive exercise. COVID-19 anxiety was more strongly related to compulsive exercise and ED pathology for individuals with lower intolerance of uncertainty (59). Anorexia nervosa is associated with a low level of acceptance to unexpected events avoiding uncertainty (42).

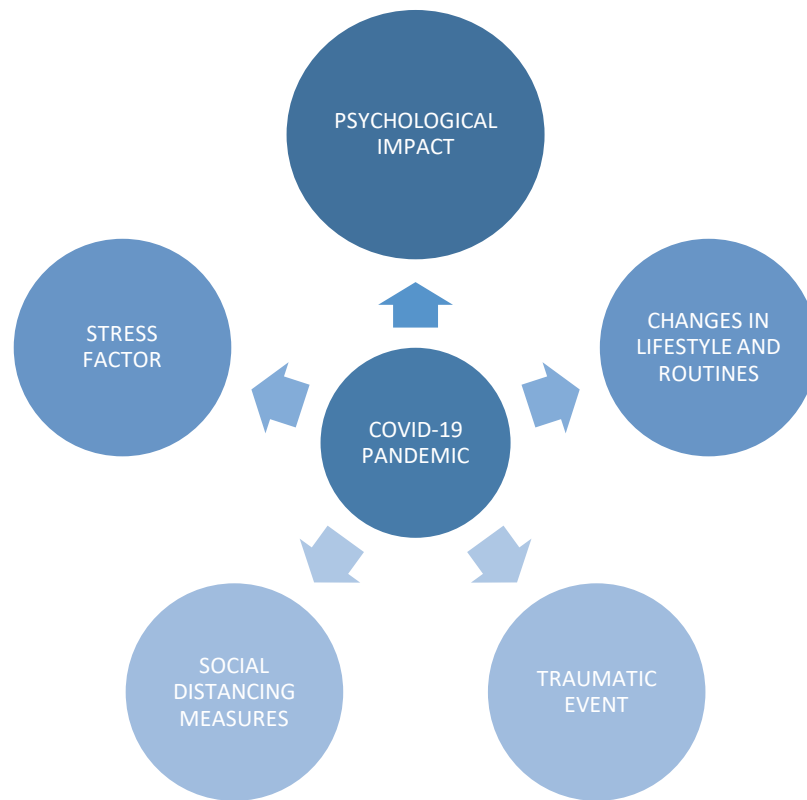


Figure 5: Scheme of the factors associated with ED behaviors during the pandemic

4. JUSTIFICATION

In the last decades, eating disorders have gained increasing socio-sanitary relevance due to their severity, complexity and difficulty in establishing the diagnosis and specific treatment. As discussed so far, eating disorders are **serious mental illnesses** defined by abnormal eating behaviors that affect negatively the individual physical and mental health. They include 3 typical disorders: anorexia nervosa, bulimia nervosa and binge eating disorder. Although they are not among the most prevalent mental disorders, they usually affect mostly adolescents, who are a population in a vulnerable period of life. Moreover, ED have a **high mortality and comorbidity rate**.

The etiopathogenetic of ED is still under study, but among the risk factors are considered individual, family and sociocultural factors. Experiencing a traumatic or stressful event, can be a danger circumstance in some individuals. In this regard, **the COVID-19 pandemic may have been a risk factor**, whether as a **precipitating, predisposing or maintenance** factor for certain vulnerable individuals, especially adolescents. And on top of that, social containment measures such as **confinement and social distancing may have been determining aspects for the onset and maintenance of eating disorders**. For example, there is evidence that in a situation of boredom, loneliness or stress, some eating behaviors such as overeating or binge eating can be aggravated and then compensated with purgative or restrictive behaviors. Besides, this situation can compromise a person's emotional health with the possibility of having more depressive thoughts, anxiety, feelings of loss of control or fear among other emotions.

Therefore, this study intends to determine what impact the COVID-19 pandemic, lockdown and social restrictions have had on the adolescent population analyzing if there has been an increase in the number of newly diagnosed cases of eating disorders compared to previous years. And to have even more information, it will analyze if there has been an exacerbation of these disorders focusing on the adolescent population already diagnosed. If it is found that the pandemic **may have had a negative impact**, this may be a reason to consider **programs to detect and treat these at-risk individuals**. Early detection of eating disorders can reduce the risk of death, serious health consequences and the cost of intensive treatment.

An increase in the incidence of ED would entail a **significant health cost**, in addition to the impact on the education, social life and quality of life of newly diagnosed individuals. The course of the eating disorder often **becomes chronic** if patients are not identified and treated in time. In some cases, these disorders **may worsen the quality of life** of the patients by increasing the risk of having medical complications and comorbidities. For this reason, it is relevant to study those factors that can modify or worsen the clinical course.

Since the measures of social distancing vary according to the epidemiological situation of the region, if the situation worsens there is a likelihood of **further confinement**. Then, it will be helpful to have as much information as possible about the negative effects it has had on the population in order to find ways to prevent it from happening again.

To this end, this study could be the **first step for future studies and primary prevention campaigns**, in case a similar situation occurs again, and would provide **new evidence** and a **better insight** into the impact of COVID-19 pandemic on eating disorders in adolescents.

Besides, the pandemic situation is a **current** and **novel** topic of **global interest**. It has affected the world and, therefore, the population exposed to possible negative effects is very large. In this last year there have been many publications on topics related to the COVID-19 and in the area of psychiatry there have already appeared the first results regarding the effects at the psychological level. In the specific case of eating disorders, the first studies show an important impact on the adolescent population. However, **research is still needed**.

Finally, it should be noted that the type of study proposed, in addition to being **economical** and **easy to carry out**, has no administrative, statistical or ethical complications or difficulties.

5. HYPOTHESIS

Main hypothesis

During the COVID-19 pandemic, lockdown and social restrictions there has been an increase of the incidence of eating disorders in adolescents between 12 and 18 years old in Girona.

Secondary hypothesis

During the COVID-19 pandemic, lockdown and social restrictions there has been an exacerbation of eating disorders according to the increase in the number of hospitalizations of adolescents between 12 and 18 years old diagnosed in Girona.

6. OBJECTIVES

Main objective

The primary objective of this study is to analyze whether there has been an increase on the incidence of eating disorders in the adolescent population of Girona during the COVID-19 pandemic, lockdown and social restrictions compared to the same periods the last 3 years.

Secondary objectives

One secondary objective of this study is to determine whether there has been an exacerbation of eating disorders in the adolescent population diagnosed in Girona based in the number of hospitalizations during the COVID-19 pandemic, lockdown and socials restrictions compared to the same periods the last 3 years.

Other secondary objectives of this study are to determine whether there have been differences in the results according to age, gender and type of eating disorder (AN, BN or BED).

7. METHODOLOGY

7.1. STUDY DESIGN

The type of design to be used is a before-and-after observational study using clinical health records. It will be a quasi-experimental, longitudinal, and prospective study but with historical data. Measurements will be taken before the exposure to the pandemic (pre-pandemic period) by collecting information from 2017, 2018 and 2019. The rest of the measurements will be taken during the exposure to the pandemic (pandemic period) by collecting data from 2020. A quantitative methodology will be used.

7.2. SAMPLE

In this study there are two different populations, one for the main objective and the other for the specific secondary objective which determines whether there has been an exacerbation of eating disorders in the diagnosed adolescents. The primary objective population will be named *Population A* and the secondary objective population will be named *Population B* for ease of understanding.

Population:

- *Population A* will be composed of adolescents between 12 and 18 years old from Girona.
- *Population B* will be composed of patients between 12 and 18 years from Girona diagnosed with a typical eating disorder (AN, BN or BED).

Sampling:

- The sample of *Population A* will be selected with a non-probabilistic convenience sampling method from the adolescent population between 12 and 18 years old of the sanitary region of Girona. The sample will be integrated by patients living in one of the following areas: Gironès – Pla de l'Estany, Baix Empordà, Alt Empordà, La Selva Interior, La Selva Marítima, La Garrotxa and Ripollès.
- The sample of *Population B* will be selected with a non-probabilistic convenience sampling method from the adolescent population between 12 and 18 years old diagnosed with an ED of the sanitary region of Girona. The sample will be integrated by patients living in one of the following areas: Gironès – Pla de l'Estany, Baix Empordà, Alt Empordà, La Selva Interior, La Selva Marítima, La Garrotxa and Ripollès.

Sample selection:

- The sample of *Population A* includes the adolescents between 12 and 18 years from the sanitary region of Girona.
- The sample of *Population B* includes the patients between 12 and 18 years from the sanitary region of Girona with the diagnosis of a typical ED (AN, BN or BED).

Sample size:

The sample size has been calculated from *Population A*¹, using an online free sample size calculator to determine the necessary subjects to include in the study derived from the present protocol (60).

According to the data available in the *Mental Health and Addiction Management Area* located in Parc Hospitalari Martí i Julià:

- **Prevalence of ED:** The annual prevalence of people attended in all the Mental Health Centers from the XSM in 2018 was 4,11% of 142.001 which is the reference population of children and adolescents of Girona, corresponding to 5.842 individuals. The 6,6% of individuals attended in all the Mental Health Centers from XSM in 2018 had the diagnosis of ED, corresponding to 385 people of the total 5.842 attended.
- **The incidence of ED:** The incidence of eating disorders in the adolescent population according to the literature consulted is approximately 3% (61). According to the experience of the professionals who work in the specialized area of eating disorders of the sanitary region of Girona, it is estimated that the incidence will be increased by 40% during the COVID-19 pandemic, therefore becoming 4.2% (62). The reference population of adolescents between 12 and 18 years old corresponds to 62.364.

Using the ARCSINUS approximation and accepting an alpha risk of 0.05 and a beta risk of 0.2 in a bilateral contrast, 8.573 subjects in the non-exposed to the pandemic group (from 2017, 2018 and 2019) and 2.829 in the exposed group (from 2020) are needed to detect as statistically significant the difference between two ratios, which for the first group is expected to be 0.03 and in the second group 0.042.

7.3. STUDY SUBJECTS

The inclusion and exclusion criteria of *Population A*² will be:

INCLUSION CRITERIA	EXCLUSION CRITERIA
Adolescents between 12 and 18 years old of the sanitary region of Girona.	Adolescents with the diagnosis of an ED.

¹ The calculation of the sample size of *Population B* will be done also with the same program.

² In the case of *Population B*, the inclusion criteria would be patients with the diagnosis of AN, BN or BED according to the criteria of ICD-11 and DSM-5 between 12 and 18 years of Girona. The exclusion criteria would be those patients with another mental disorder causing the symptomatology of the ED.

7.4. STUDY VARIABLES

INDEPENDENT VARIABLE

The independent variable of this study will be the COVID-19 pandemic, lockdown and social restrictions consisting in the period of time when data was taken. The national lockdown took place between March and June. From June onwards, other social restriction measures were applied according to the evolution of the pandemic. Therefore, the independent variable will consist of 8 periods: during and after the national lockdown and the same period the 3 years before.

1. **Lockdown pandemic period:** Period including the COVID-19 lockdown starting on the 12th March until the 21th June of 2020.
2. **Pre-pandemic period 1:** The same period of time but in 2017.
3. **Pre-pandemic period 2:** The same period of time but in 2018.
4. **Pre-pandemic period 3:** The same period of time but in 2019.
5. **Post-lockdown pandemic period:** Period including the post COVID-19 lockdown but with social restrictions measures starting on 22th June until 22th November.
6. **Pre-pandemic period 4:** The same period of time but in 2017.
7. **Pre-pandemic period 5:** The same period of time but in 2018.
8. **Pre-pandemic period 6:** The same period of time but in 2019.

	January	February	March	April	May	June	July	August	September	October	November	December
2017			PRE-PANDEMIC PERIOD 1				PRE-PANDEMIC PERIOD 4					
2018			PRE-PANDEMIC PERIOD 2				PRE-PANDEMIC PERIOD 5					
2019			PRE-PANDEMIC PERIOD 3				PRE-PANDEMIC PERIOD 6					
2020			LOCKDOWN PANDEMIC PERIOD				POST-LOCKDOWN PANDEMIC PERIOD					

DEPENDENT VARIABLE

The dependent variable of the main objective is the **incidence proportion** (likewise cumulative incidence) of eating disorders. It is a continuous quantitative variable expressed as a percentage. Cumulative incidence is calculated as the number of newly diagnosed cases of eating disorders (AN, BN or BED) divided by the total number of individuals in the population at risk for the disorders for a specific time interval. It is considered as the probability or risk of an individual to develop the disorder in that period.

Cumulative incidence:
$$\frac{\text{number of new cases of ED during the especific period}}{\text{adolescent population between 12–18yo at the beginning of the period}}$$

New diagnoses of eating disorders can be made from primary care, pediatrics or psychiatry in consultations, visits to mental health center, visits to emergency room, inter-consultations or hospitalizations. The diagnosis must be based on the criteria of ICD-11 or DSM-5 (see in [appendix 16.1](#)).

The dependent variable of the secondary objective is the proportion of patients with an exacerbation of the eating disorder, which is defined as a worsening of the clinical course of the disease that requires for mental health attendance at the XSM of Girona. This proportion of patients will be selected from the **number of hospitalizations** of adolescent patients with ED to the URPI (Unitat de Referència de psiquiatria infantil i juvenil). When a patient with an eating disorder is hospitalized it is usually due to a worsening of the baseline situation, which may be due to a medical complication or also due to poor control of the disorder. There are specific criteria for hospitalization ([see in appendix 16.8](#)). It is a continuous quantitative variable expressed as a percentage.

CO-VARIABLES

The following factors will be included in the statistical analysis as they have been proved to interact with the incidence of ED in a non-pandemic period.

All of them will be obtained from the mental health records:

- **Age:** expressed in years and absolute values. It is a discrete quantitative variable.
- **Gender:** defined as man/female/unknown. It is a nominal qualitative variable.
- **Type of ED:** defined as anorexia nervosa, bulimia nervosa or binge eating disorder. It is a nominal qualitative variable.

Estimates of the incidence of eating disorders vary according to the type of disorder and the population studied (according to age and gender). Generally, the risk of developing the disease is higher in women, and depending on the disorder, the age of risk may also vary.

7.5. DATA COLLECTION

All the data can be obtained from the XSM in the *Registre del conjunt mínim bàsic de dades de salut mental* (CMBD SM), the *El sistema integrat d'informació sanitària* (SIIS), the *Servei Català de la Salut* (CatSalut) and from the registers and memory of the Institut d'Assistència Sanitària (IAS) from the region of Girona.

It will not be necessary to use data from the medical history, since all parameters can be obtained encoded in health records.

7.6. STATISTICAL ANALYSIS

Statistical analysis will be performed using Statistical Package for Social Sciences (SPSS) for Windows®.

DESCRIPTIVE- UNIVARIATE ANALYSIS

Different measures will be used to analyze all the variables depending on their characteristics:

- Quantitative variables such as age, incidence and the number of hospitalizations will be summarized by a measure of central tendency and a measure of dispersion, being mean and standard deviation if they are normally distributed or median and quartile if they are not.

- Qualitative variables such as the periods of time, gender and type of eating disorder will be summarized by proportions in a contingency table.

BIVARIATE ANALYSIS

- The covariates will be analyzed according to the independent variable (periods of time) which is a qualitative variable:
 - In the case of age, since it is a quantitative variable, t-student will be used.
 - In the case of the type of disorder and the gender of the person, as these are qualitative variables, the chi-squared test (χ^2) will be used.

MULTIVARIATE ANALYSIS

- The cumulative incidence of ED between the 8 periods will be compared using a Poisson regression.
- The number of hospitalizations in the adolescents diagnosed will be compared between the 8 periods of time using a Poisson regression.

8. WORK PLAN AND CHRONOGRAM

The project schedule will consist of 15 activities distributed among 8 stages in which the different components of the team will participate.

- **Stage 1: PROTOCOL DESIGN**
 - Timing: This phase has already been done during a period of 2 months between the 20th of November of 2020 and the 20th of January of 2021.
 - Personnel: Principal investigator.
 - **Activity 1**: Bibliographic research was done.
 - **Activity 2**: The present protocol was written.
- **Stage 2: CLINICAL RESEARCH ETHICS COMMITTEE**
 - Timing: This phase will take 2 months.
 - Personnel: Principal investigator and CEIC.
 - **Activity 3**: The protocol will be presented at the “Comitè Ètic d’Intervenció Clínica” (CEIC) of the IAS for the ethics approval.
- **Stage 3: COORDINATION AND ORGANIZATION**
 - Timing: This phase will need 1 month.
 - Personnel: Principal investigator and collaborate investigators.
 - **Activity 4**: The principal investigator will recruit the researchers to create the research team.
 - **Activity 5**: The lead researcher will request the data management officer to access to the Xarxa de Salut Mental, just in case they do not have access rights.
 - **Activity 6**: All members of the research team will hold a coordination meeting to program the chronogram on the calendar and assign tasks.
- **Stage 4: DATA COLLECTION**
 - Timing: This phase will take 100 hours distributed in 2 months.
 - Personnel: Person in charge of data collection.
 - **Activity 7**: The person in charge of data collection will select all subjects from the reference population that meet the inclusion criteria of this study.
 - **Activity 8**: The person in charge of data collection will add to each profile the data from the mental health records.
 - **Activity 9**: The person in charge of data collection will be responsible for checking that all data are anonymous.

- **Stage 5: STATISTIC ANALYSIS**
 - Timing: This phase will take 100 hours distributed in 2 months.
 - Personnel: Statistic specialist.
 - **Activity 10**: The statistic specialist will analyze the collected data and will describe the results.

- **Stage 6: INTERPRETATION**
 - Timing: This phase will take 2 months.
 - Personnel: Research team.
 - **Activity 11**: The research team will update the bibliography. This activity will be repeated once each week until the writing of the paper.
 - **Activity 12**: The investigation team will receive and assess the results individually. This activity will take 4 weeks.
 - **Activity 13**: The investigation team will discuss the results and set the conclusions. They will need 3 online meetings.

- **Stage 7: ELABORATION OF THE FINAL STUDY**
 - Timing: This phase will need 1 month.
 - Personnel: Principal investigator.
 - **Activity 14**: The principal investigator will write the latest version of the study with the results and conclusions.

- **Stage 8: PUBLICATION OF THE STUDY**
 - Timing: This phase will need 2 months.
 - Personnel: Principal investigator.
 - **Activity 15**: The results will be summarized in format of scientific papers and will be sent to medical journals for their publication.

Table 11: Chronogram

Stage	Activity	2020		2021												2022	
		NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	
1	1																
	2																
2	3																
3	4																
	5																
	6																
4	7																
	8																
	9																
5	10																
6	11																
	12																
	13																
7	14																
8	15																

9. BUDGET

Table 12: Budget of the study

EXPENSES	BUDGET PROPOSAL		
	QUANTITY	COST PER UNIT	COSTS (euros)
PERSONAL COSTS			
Investigation team	5 investigators	0 euros	0
MATERIAL AND SERVICES			
Statistician	100 h	40 euros/hour	4.000
Data management	100 h	30 euros/hour	3.000
PUBLICATION AND DISSEMINATION			
Publication	1	1.500 euros	1.500
Conferences and national travels	1	1.500 euros	1.500
TOTAL			10.000

The elaboration of the protocol and the bibliography research did not require any expenses, nor will the presentation to the CEIC or the access to the data resources. The team of researchers will perform all tasks related to the coordination and interpretation of the results, and will not receive any monetary compensation.

The extraction of data from the registry and health records, including the sample selection and the recollection of all the variables involved in the study will take 100 hours of work, which will cost 3.000€. The statistical analysis will take 100 hours of work, which will cost 4.000€. The payment for open access publication costs around 1.500€.

Due to the current pandemic, all meetings will be conducted online, so no travel expenses will be incurred. A national conference is planned when the epidemiological and health situation allows it at the approximate cost of 1.500€.

10. ETHICAL AND LEGAL CONSIDERATIONS

This study will be conducted in accordance with Beauchamp and Childress' four ethical principles (non-maleficence, beneficence, autonomy and justice) and with the requirements expressed in the Declaration of Helsinki of Ethical Principles for Medical Research Involving Human Subjects signed by the World Medical Association in 1964 and last revised in October 2013.

With the current legislation on personal data protection abided:

- Regulation (EU) 2016/679 of the European parliament and of the council of 27th April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General data protection regulation) (63).
- Ley orgánica 3/2018, de 5 de diciembre, de Protección de Datos personales y garantía de los derechos digitales (64).

The study will also be submitted to the Clinical Research Ethics Commission (CEIC) of the Institut d'Assistència Sanitaria (IAS). Moreover, the recommendations given by the committee will be considered to proceed with the study.

The main resource of data in the derived study will be from the mental health records of XSM where all the parameters of ED have been recorded. Informed consent was not requested before patients were entered into the registry, as it is a population-based registry.

The authors declare no conflict of interests.

11. STRENGTHS AND WEAKNESSES

STRENGTHS

One of the most important strengths of this study is that it is a topical subject that has not yet been analyzed. Therefore, it opens doors to many studies in the future. The psychological impact that the pandemic has had on adolescents is a topic of interest from a public health point of view, since the results may indicate the need for greater attention to this population. Besides, eating disorders are pathologies with high personal and economic costs and any change in their prognosis or evolution is important to analyze.

Another strength to consider is the type of study chosen. One of the main reasons for the popularity of before-and-after study designs is the low cost, convenience, and simplicity of conducting the studies. Another advantage of this design is its usefulness in addressing ethical issues that may arise with randomized studies or prospective cohort designs. Quasi-experimental studies emerge as a possible alternative when randomization or the existence of a control group may be problematic or impossible. Similarly, when the study factor cannot be manipulated. In this regard, the exposure to the coronavirus pandemic has occurred throughout the entire population. Other studies, such as case-control or cohort studies, could not be considered if the immediate effect is to be analyzed because they need an exposed and unexposed population.

All the information can be obtained from clinical records, without the need for interviews or questionnaires. Therefore, it is objective information that can be easily analyzed.

WEAKNESSES

Although the type of study has its advantages, it also has disadvantages. One of them is the lack of comparison or control groups. Without a control group, it is difficult to establish a causal relationship between exposure and injury. The quasi-experimental study is a type of research that shares many of the characteristics of an experiment, but comparisons in subject response are made between 'non-equivalent' groups that can be differentiated in many other ways besides 'exposure'. The main difficulty will be to differentiate the specific effects of the 'exposure' from those non-specific effects that derive from the lack of comparability of the groups at the beginning and during the study, which compromises the internal validity of the study. In the case that there is no control group, it cannot be guaranteed that the changes that appear are due to the exposure itself, or to other variables or uncontrolled factors. The increase on incidence of ED could be influenced by other factors besides of COVID-19 pandemic situation, such as the personal issues and experiences.

12. LIMITATIONS

This protocol has limitations that should be considered due to its potential interference with the proposed research. The most important limitations are detailed below:

- The main objective of the study is to analyze if there has been an increase in the incidence of eating disorders during the pandemic situation in the adolescent population. If there is an increase in the incidence, since this is a study without a control group with non-exposed individuals, there would be no complete certainty that the exposure to the pandemic situation was the unique factor that increased the number of newly diagnosed cases. Furthermore, during the period of lockdown, there were many changes in routines and schedules. Parents working and adolescents studying at home may have exposed eating behaviors more to the family. Therefore, more cases may have been detected.
- Alternatively, there may be no increase or even a decrease in the incidence. This finding could be explained by the fact that during the exposure to the pandemic, health care facilities were affected and, in some cases, the assistance activity was cancelled. As a result, some visits were suspended and due to the fear of infection, there could be fewer consultations and, therefore, fewer new diagnoses of ED.
- The same could be said for the secondary objective. The number of hospitalizations could have been even lower during the period of confinement. For that reason, the period of exposure to the pandemic will be divided in two: the first period during the confinement when there was more collapse of public health (lockdown pandemic period) and the second period after the confinement (post-lockdown pandemic period) when it started the return to the normality. Some experts point out that the confinement may have uncovered some pathological behaviors but that they were not detected in mental health centers until after the confinement.
- The secondary objective has its limitations since the number of hospitalizations for eating disorders in adolescents diagnosed will be used to express the exacerbation of the disease quantitatively. Probably the best way to evaluate the worsening of the disorder is through questionnaires or interviews. However, exposure to the pandemic is not a controllable factor; it appeared unanticipated with the difficulties that it entails. Usually, studies are prepared in advance to obtain before and after information. In the case of the COVID-19 pandemic, this couldn't be done and pre-exposure questionnaires were not passed to compare the situation afterward. Therefore, the way to qualitatively assess the worsening of the disease would be bypassing questionnaires with retrospective intent. This method would include memory bias. For these reasons, the quantitative analysis was found to be more accurate. However, hospital admission is not directly the definition of an eating disorder exacerbation. It is a way of quantifying it. In other words, to be admitted to the hospital, certain criteria must be met, but the clinical worsening may be due to the patient's baseline situation without an exacerbation of the

disease having occurred. For example, a patient with very severe anorexia may be admitted because she or he has suffered a medical complication as a result of the disease itself without there being a precipitating factor. In this sense, the information obtained would serve as a hypothesis for future more specific studies but, in itself, would not give a final result.

- Although home confinement was indeed carried out throughout Spain, there may have been differences in the social distancing measures adopted subsequently in the different sanitary regions according to the epidemiological situation of the place. This fact may compromise the external validity of the study.
- This study will collect the covariates from codes in mental health records without the need to access the patient's clinical history. However, there are indeed some variables that would be interesting to analyze because they could be variables of interaction. Some examples might be the severity of the disorder, family history of eating disorders, personal history of mental disorders or the type of sport they practice.
- As ED are influenced by numerous factors that correlate with each other in order to avoid confusion bias, it is important to identify all confusing variables and introduce them into the statistical analysis of the data in order to minimize this bias. However, it's not possible to control the confusing variables that aren't known. In this sense, since this is a situation that has not been experienced before, there are many factors that may be determining but have not yet been found. Either because they have not been identified or recorded, if there is a variable that may affect the incidence of eating disorders and it is different between the periods being analyzed, there could be a confounding bias. However, this is unlikely since the population has not changed substantially in recent years.
- Eating disorders are often detected after a long period of illness because many sufferers hide it and deny the problem and, unfortunately, symptoms can be difficult to identify. Research indicates that health professionals may only identify approximately 10% of patients with BED, 50% of patients with AN and subclinical anorexia and <10% of patients with BN (65). For these reasons, some cases may not have been detected in the proposed periods.
- To analyze whether there has been an increase in the incidence of eating disorders, the periods of exposure to the pandemic are compared to the previous years. However, each year may have factors that can affect the incidence of eating disorders. Some examples that may trigger these disorders and may vary over the years are clothing trends, regional economic conditions and average physical activity in the population. For this reason, it has been proposed to compare the incidence during exposure to the pandemic with three different years, so that factors that may influence can be dispersed. Therefore, eight periods are collected: two during exposure and six before exposure (two per year).

13. RESEARCH TEAM AND FEASIBILITY

RESEARCH TEAM

- **Person in charge of data collection:** it requires access to the mental health registry. This person will not be part of the investigator team.
- **Statistic specialist:** will be in charge of performing the data analysis and describing the results. It has been estimated that this work will take 100 hours. This person will not be part of the investigator team.
- **The investigator team will be multidisciplinary:** The research team will be formed following the model of the professionals working in the transversal program of eating disorders in the health region of Girona. It will consist of: a psychiatrist, psychologist, nurse, social worker and the principal investigator. The results will be analyzed and will set the conclusions.

FEASIBILITY

The reference population of the “Xarxa de salut Mental i Addicions” (XSM) of the region of Girona is 728.521 people, 142.001 of them under 18 years old. Particularly, there are seven “Centres de Salut Mental Infantil i Juvenil” along the sanitary region of Girona which offer specialized mental health care to children and adolescents from 0 to 18 years old.

All team members are qualified professionals trained to assess adolescents with mental disorders with an extensive professional experience in the subjects approached and high commitment to collaborate actively in the study, in coordination with the rest of the team.

For the exposed reasons the current study is considered feasible regarding the availability of the participants and the professionals in charge of its development.

14. CLINICAL AND HEALTH CARE IMPACT

Mental health of adolescents has become one of the **major public health challenges** worldwide. Moreover, in developed countries, mental disorder is increasingly recognized as the most important health problem among children and adolescents.

Mental health issues are not just a problem affecting the adolescent and family at present; it has been shown that **untreated problems in childhood have a strong tendency to persist into adulthood**. Among 70% of mental health problems in young adults begin in childhood or adolescence. The consequences of prolonged poor mental health are mainly related to the consolidation of maladaptive behaviors and the increased likelihood of having a disability (39). According to UNICEF, these difficulties may be related to poor educational outcomes, unsatisfactory social relations, uncontrolled substance use, unstable lifestyles, poor sexual and reproductive health, self-injurious behavior and poor self-care and self-esteem. Positive mental health enables cognitive and emotional flexibility and is closely related to social skills and competencies, especially resilience. Therefore, there is a feedback relationship between mental health and protective factors of the patient.

In Catalonia, Article 45 of Law 14/2010, on the rights and opportunities in children and adolescents, highlights the priority of developing programs aimed at prevention, detection, early diagnosis, treatment and comprehensive care of mental health needs of children and youth, from the public health network of Catalonia.

The coronavirus pandemic has affected the entire population on many levels. At the health level, it has paralyzed some health care activities and may delay the diagnosis and treatment of some diseases. In the case of mental health, in addition to the difficulty of care, there have been many stressors that could have led to the emergence of psychiatric disorders such as anxiety, depression or, as proposed in this study, eating disorders.

In addition to everything already mentioned about **eating disorders**, they represent **the third most common chronic disease in the adolescent population**. Recent studies estimate the prevalence of ED among adolescents at over 6%. In Catalonia, considering these prevalence data, it is estimated that some 28,000 men and women may be suffering from a disorder of this type, either anorexia nervosa, bulimia nervosa or binge eating (which leads to overweight or obesity). While it is true that, compared to other mental disorders, this figure is very high; **11% of adolescents in our country are currently engaging in risky behavior concerning these mental disorders**; it also makes this population more likely to end up meeting the criteria for the diagnosis of an eating disorder (66).

Primary prevention aims to limit the incidence of disease by managing the causes and exposure to risk factors or increased patient resistance to them. The first step in establishing primary prevention measures is to identify relevant exposures and assess their impact on the patient's and population's risk of developing the disease. This protocol is intended to be the first step in this direction.

Different studies carried out in European Union countries indicate that direct costs (diagnosis, treatment and follow-up or monitoring) and especially indirect costs (economic losses derived from the disease that impact on the patient and his or her social environment), **entail a high economic burden and considerably diminish the quality of life** of patients with eating disorders.

In summary, this study will have a great clinical impact, paving the way for future new strategies into the daily clinical practice concerning both the detection and treatment of ED among adolescents, and consequently decreasing mortality and complications of these disorders.

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16. APPENDIX

16.1 DSM-5 DIAGNOSTIC CRITERIA FOR ED

CRITERIA	ANOREXIA NERVOSA
A	Restriction of energy intake relative to requirements leading to a significantly low body weight in the context of age, sex, developmental trajectory and physical health. Significantly low weight is defined as a weight that is less than minimally normal or, for children and adolescents, less than that minimally expected.
B	Intense fear of gaining weight or becoming fat or persistent behavior that interferes with weight gain, even at a significantly low weight.
C	Disturbance in the way in which one's body weight or shape is experienced, undue influence of body weight or shape on self-evaluation, or persistent lack of recognition of the seriousness of the current low body weight.
	<p>There are two types:</p> <ul style="list-style-type: none"> ▪ Restrictive type: during the last three months, the individual has not had recurrent episodes of bingeing or purging (self-inducing vomits or taking laxatives, diuretics or enemas). The weight loss is due primarily to diet, fasting or excessive exercise. ▪ Binge/purge type: during the last three months, the individual has had recurrent episodes of bingeing or purging (self-inducing vomits or taking laxatives, diuretics or enemas). <p><i>Exchange between subtypes during the course of the disorder is not uncommon.</i></p>

CRITERIA	BULIMIA NERVOSA
A	<p>Recurring bouts of binge eating. A binge-eating episode is characterized by the following two events:</p> <ol style="list-style-type: none"> 1. Ingestion, in a given period (e.g. within any two-hour period), of an amount of food that is clearly greater than what most people would eat in a similar period under similar circumstances. 2. Feeling of lack of control over what is swallowed during the episode (e.g. feeling that you cannot stop eating or control what is swallowed or how much is swallowed).
B	Recurring inappropriate compensatory behaviors to avoid weight gain, such as self-induced vomiting, incorrect use of laxatives, diuretics or other medications, fasting, or excessive exercise.
C	Binge eating and inappropriate compensatory behaviors occur, on average, at least once a week for three months.
D	Self-assessment is unduly influenced by constitution and body weight.
E	The disturbance does not occur exclusively during episodes of anorexia nervosa.

CRITERIA	BINGE EATING DISORDER
A	<p>Recurring bouts of binge eating. A binge-eating episode is characterized by the following two events:</p> <ol style="list-style-type: none"> 1. Ingestion, in a given period (e.g. within any two-hour period), of an amount of food that is clearly greater than what most people would eat in a similar period under similar circumstances. 2. Feeling of lack of control over what is swallowed during the episode (e.g. feeling that you cannot stop eating or cannot control what is swallowed or the amount of what is swallowed).
B	<p>Binge-eating episodes are associated with three (or more) of the following:</p> <ol style="list-style-type: none"> 1. Eat much faster than normal. 2. Eat until you feel unpleasantly full. 3. Eat large amounts of food when you are not physically hungry. 4. Eating alone because of the shame you feel about the amount you eat. 5. Then feel uncomfortable with yourself, depressed or very ashamed.
C	Intense discomfort regarding binge eating.
D	Binge eating occurs, on average, at least once a week for three months.
E	Binge eating is not associated with the recurrent presence of inappropriate compensatory as in bulimia nervosa and does not occur exclusively in the course of bulimia nervosa or anorexia nervosa.

16.2 MENTAL HEALTH NETWORK IN GIRONA

Criteria to decide which patients go to which level of care (25):

- **Referral to mental health:** The criteria for referral from primary care to mental health (CSMA and CSMIJ) are the following:

- When there is an established ED diagnosis.
- Loss of weight equal to 10% -25% of the weight, without a justifying cause.
- Presence of regular bulimic episodes, over-eating behaviors and / or persistent purgative behaviors (self-induced vomiting, abuse of laxatives and use of diuretics).
- Presence of associated psychopathological alterations.
- Lack of awareness of illness.
- Despite following the primary care guidelines, weight and bulimic behaviors do not improve.

- **Referral to urgent hospitalization:** The criteria for referral from the primary care to urgent hospitalization (general hospital emergency service) to receive urgent medical treatment are the following:

- Weight loss > 50% in the last 6 months (30% in the last 3 months).
- Alterations in consciousness.
- Seizures.
- Dehydration.
- Severe liver or kidney disorders.
- Pancreatitis.
- Decrease in potassium <3 mEq / l or sodium (<130 or > 145).
- Severe arrhythmia or conduction disorder.
- Bradycardia of <40 bpm.
- Other ECG disorders.
- Syncope or hypotension with <70 mm Hg.
- High digestive hemorrhage: hematemesis, rectal bleeding.
- Acute gastric dilation.

- **Referral for urgent psychiatric evaluation:** The criteria for referral from the primary care to urgent psychiatric evaluation are the following:

- Absolute refusal to eat or drink.
- Depressive symptoms with risk of autolysis.
- Important self-injurious behaviors.

- **Complete hospitalization criteria:**

- The biological status that implies risk of serious complications (no food and especially liquid intake, BMI <16, ionic alterations, continuous self-induced vomiting, abuse of laxatives and use of diuretics, hematemesis and rectal bleeding).
- There are significant depressive symptoms with risk of autolysis.
- Important self-injurious behaviors.

They are not absolute criteria and, depending on the intensity, the day hospital (partial hospitalization) may be indicated. For the complete hospitalization it will be necessary the authorization of the judge and, convenient but not essential, the authorization of the parents and the judge in the case of minors and judicial authorization in adults.

○ **Criteria for admission to the day hospital:**

- From the CSMA / CSMIJ. If the patient does not meet the criteria for urgent medical care or urgent psychiatric admission and meets any of the following criteria:

- Due to their psychopathology, the affected person is unable to follow the guidelines of the outpatient program: frequency of visits, limitation of physical activity, indicated diet, etc.
- There are serious behavior problems at home, there are conflicts in family relationships and / or family psychopathology and it is not modified on an outpatient basis.
- The evolution of the weight does not follow the rhythm established in the outpatient weight recovery program.

- From the complete hospitalization (once the discharge criteria have been met).

- Whether there is a need to maintain more control over eating or behaviors, but it can be done on an outpatient basis.
- In those cases that, due to the intensity of their psychopathology, require psychological treatment to modify their image, their cognitions, assertiveness or other aspects of eating disorders.

○ **Criteria for discharge from complete hospitalization:**

- Normalization of the biological alterations that have motivated complete hospitalization.
- Weight recovery according to an individualized program.
- Improvement of the psychopathological state.
- Disappearance of self-injurious behaviors.
- Remission of abnormal eating behaviors and compensatory behaviors.
- Improvement of family conflicts.
- Improved general functioning.

○ **Day hospital discharge criteria for referral to outpatient clinics (CSMA/CSMIJ):**

- Recovery and/or maintenance of weight.
- Completion of group programs started.
- Improvement of the intake pattern and compensatory behaviors.
- Improvement of family conflicts and general functioning that allows the outpatient treatment.

○ **Discharge criteria for the outpatient treatment program:**

- Maintenance of undisturbed eating behaviors (diets, overfeeding and purging) for one year.
- Maintenance of stable weight and within normality for one year.
- Absence of menstrual irregularities secondary to ED.
- Reduced risk of relapse.
- Absence of other psychopathological disorders requiring treatment.

- **Criteria for discharge from ED:** The completion of the process will take place when the clinical improvement is evident and allows the incorporation of the patient to the daily life, verifying that during a period of time superior to two years it fulfills the following criteria:

- Weight maintenance and absence of nutritional alterations.
- Absence of food behaviors harmful to health.
- Adequate relational life.

16.3 SCOFF QUESTIONNAIRE

The SCOFF Questionnaire is a five-question screening tool that has been validated in specialist and primary care settings. Score of 2 or more positive answers should raise the index of suspicion of a case, highlighting need for more detailed history. The questions can be delivered either verbally or in written form (67).

Table 13: SCOFF questionnaire

S	Do you make yourself Sick (induce vomiting) because you feel uncomfortably full?
C	Do you worry you have lost Control over how much you eat?
O	Have you recently lost more than One stone (6.35 kg) in a three- month period?
F	Do you believe yourself to be Fat when others say you are too thin?
F	Would you say Food dominates your life?

One point for every yes answer; a score 2 indicates a likely case of anorexia nervosa or bulimia nervosa (sensitivity: 100 percent; specificity: 87.5 percent).

Two more questions have been shown to indicate a higher sensitivity and specificity for BN:

- Are you satisfied with your eating patterns?
- Do you ever eat in secret?

16.4 EAT-40 QUESTIONNAIRE

The EAT-40 is a questionnaire to evaluate common symptoms and behaviors in anorexia nervosa. It also provides an index of the severity of the disorder. It consists of 40 items that are grouped into seven factors: food preoccupation; body image with a tendency to thinness; use and/or abuse of laxatives and presence of vomiting; food restriction (diet); eating slowly; eating clandestinely; perceived social pressure to gain weight.

Each item presents six possible answers that range from always to never and is scored from 1 to 3. The total score is obtained by adding up the scores from 1 to 3 for each item. Total scores can range from 0 to 120. In items 1, 18, 19, 23, 27 and 39 (never 3 points; almost never 2 points, sometimes 1 point; rest 0 points). In the remaining items (always 3 points; almost always 2 points; quite often 1 point; remainder 0 points). The authors propose as a cut-off point a total score of 30. The total score it provides allows to distinguish between anorexic patients and normal population, bulimic patients and normal population, but it does not allow to distinguish between anorexics and bulimics (68).

Table 14: EAT-40 questionnaire

		Nunca	Casi nunca	Algunas veces	Bastantes veces	Casi siempre	Siempre
1	Me gusta comer con otras personas						
2	Preparo comidas para otros, pero yo no me las como						
3	Me pongo nervioso/a cuando se acerca la hora de las comidas						
4	Me da mucho miedo pesar demasiado						
5	Procuro no comer aunque tenga hambre						
6	Me preocupa mucho por la comida						
7	A veces me he "atracado" de comida, sintiendo que era incapaz de parar de comer						
8	Corto mis alimentos en trozo pequeños						
9	Tengo en cuenta las calorías que tienen los alimentos que como						
10	Evito, especialmente, comer alimentos con muchos hidratos de carbono (p.ej. pan, arroz, patatas, etc.)						
11	Me siento lleno/a después de las comidas						
12	Noto que los demás preferirían que yo comiese más						
13	Vomito después de haber comido						
14	Me siento muy culpable después de comer						
15	Me preocupa el deseo de estar más delgado/a						
16	Hago mucho ejercicio para quemar calorías						
17	Me peso varias veces al día						
18	Me gusta que la ropa me quede ajustada						
19	Disfruto comiendo carne						
20	Me levanto pronto por las mañanas						
21	Cada día como los mismos alimentos						
22	Pienso en quemar calorías cuando hago ejercicio						
23	Tengo la menstruación regular						
24	Los demás piensan que estoy demasiado delgado/a						
25	Me preocupa la idea de tener grasa en el cuerpo						
26	Tardo en comer más que las otras personas						
27	Disfruto comiendo en restaurantes						
28	Tomo laxantes (purgantes)						
29	Procuro no comer alimentos con azúcar						
30	Como alimentos de régimen						
31	Siento que los alimentos controlan mi vida						
32	Me controlo en las comidas						
33	Noto que los demás me presionan para que coma						
34	Paso demasiado tiempo pensando y ocupándome de la comida						
35	Tengo estreñimiento						
36	Me siento incómodo/a después de comer dulces						
37	Me comprometo a hacer régimen						
38	Me gusta sentir el estómago vacío						
39	Disfruto probando comidas nuevas y sabrosas						
40	Tengo ganas de vomitar después de las comidas						

16.5 EAT-26 QUESTIONNAIRE

By factorial analysis of the EAT-40 the 26-question version was developed, which presents a correlation of 0.98 with the questionnaire of 40.

The total score of the EAT-26 is the sum of the 26 items. They score 3, 2, 1, 0, 0 in the positive direction, assigning 3 to the answers that come closest to a symptomatic direction ("always" = 3). Only item 25 is scored in the opposite way, by scoring 0, 0, 0, 1, 2, 3 ("never" = 3). A score above the cut-off point of 20 implies the need for further research (interview by an experienced clinician).

Table 15: EAT-26 questionnaire

		Nunca	Casi nunca	Algunas veces	Bastantes veces	Casi siempre	Siempre
1	Me da mucho miedo pesar demasiado						
2	Procura no comer aunque no tenga hambre						
3	Me preocupó mucho por la comida						
4	A veces me he "atracado" de comida, sintiendo que era incapaz de parar de comer						
5	Corto mis alimentos en trozos pequeños						
6	Tengo en cuenta las calorías que tienen los alimentos que como						
7	Evito, especialmente, comer alimentos con muchos hidratos de carbono (por ejemplo, pan, arroz, patatas, etc.)						
8	Noto que los demás preferirían que yo comiese más						
9	Vomito después de haber comido						
10	Me siento muy culpable después de comer						
11	Me preocupa el deseo de estar más delgado/a						
12	Hago mucho ejercicio para quemar calorías						
13	Los demás piensan que estoy demasiado delgado/a						
14	Me preocupa la idea de tener grasa en el cuerpo						
15	Tardo en comer más que las otras personas						
16	Procuró no comer alimentos con azúcar						
17	Como alimentos de régimen						
18	Siento que los alimentos controlan mi vida						
19	Me controlo en las comidas						
20	Noto que los demás me presionan para que coma						
21	Paso demasiado tiempo pensando y ocupándome de la comida						
22	Me siento incómodo/a después de comer dulces						
23	Me comprometo a hacer régimen						
24	Me gusta sentir el estómago vacío						
25	Disfruto probando comidas nuevas y sabrosas						
26	Tengo ganas de vomitar después de las comidas						

16.6 BULIT-R QUESTIONNAIRE

The Revised Bulimia Questionnaire BULIT R is self-administered and consists of 36 items. It was designed for the purpose of detecting the risk of bulimia in the general population, not estimating its usefulness for differences between bulimia and other eating disorders. Due to the type of items, it is estimated that an average level of studies is required to answer this instrument. Although it does not have a limited time to respond, it is expected that the subject will do it in the sincerest way possible in approximately ten minutes.

1. ¿Comes alguna vez incontroladamente hasta el punto de hincharte (atracándote)?
 - a) Una vez al mes o menos (o nunca)
 - b) 2-3 veces al mes
 - c) 1-2 veces a la semana
 - d) 3-6 veces a la semana
 - e) 1 vez al día o más
2. Estoy satisfecho/a de mi patrón alimenticio.
 - a) De acuerdo
 - b) Ni de acuerdo ni en desacuerdo
 - c) Algo en desacuerdo
 - d) En desacuerdo
 - e) Muy en desacuerdo
3. ¿Has comido alguna vez hasta el punto de pensar que ibas a explotar?
 - a) Casi cada vez que como
 - b) Muy frecuentemente
 - c) A menudo
 - d) A veces
 - e) Casi nunca o nunca
4. ¿Te denominarías actualmente como alguien que come a atracones?
 - a) Sí, totalmente
 - b) Sí
 - c) Sí, probablemente
 - d) Sí, posiblemente
 - e) No, probablemente no
5. Prefiero comer...
 - a) En casa, solo/a
 - b) En casa, con otras personas
 - c) En un restaurante público
 - d) En casa de un amigo
 - e) No me importa el sitio
6. ¿Sientes que controlas la cantidad de comida que consumes?
 - a) La mayor parte del tiempo o siempre
 - b) Muchas veces
 - c) Ocasionalmente
 - d) Rara vez
 - e) Nunca
7. Uso laxantes y supositorios para controlar mi peso
 - a) Una vez al día o más
 - b) 3-6 veces a la semana
 - c) 1-2 veces a la semana

- d) 2-3 veces al mes
- e) Una vez al mes o menos (o nunca)
- 8. Como hasta sentirme demasiado cansado/a para continuar**
- a) Al menos una vez al día
- b) 3-6 veces a la semana
- c) 1-2 veces a la semana
- d) 2-3 veces al mes
- e) Una vez al mes o menos (o nunca)
- 9. ¿Con qué frecuencia prefieres comer helados, dulces o batidos durante una comilona?**
- a) Siempre
- b) Frecuentemente
- c) Algunas veces
- d) Pocas veces o nunca
- e) No me doy atracones
- 10. ¿Cuánto te preocupan tus atracones de comida?**
- a) No me doy atracones
- b) Me importa un poco
- c) Me importa moderadamente
- d) Me importa bastante
- e) Es probablemente lo que más me preocupa en mi vida
- 11. La mayoría de la gente se sorprendería si supiese cuánta comida podría consumir de una vez.**
- a) Sin ninguna duda
- b) Bastante probablemente
- c) Probablemente
- d) Posiblemente
- e) No
- 12. ¿Alguna vez comes hasta el punto de sentirte enfermo/a?**
- a) Muy frecuentemente
- b) Frecuentemente
- c) Bastantes veces
- d) Ocasionalmente
- e) Raramente o nunca
- 13. Temo comer algo por miedo a no poder parar.**
- a) Siempre
- b) Casi siempre
- c) Frecuentemente
- d) Algunas veces
- e) Casi nunca o nunca
- 14. Me siento mal conmigo mismo/a después de haber comido demasiado.**
- a) Siempre
- b) Frecuentemente
- c) Algunas veces
- d) Casi nunca o nunca
- e) No como demasiado
- 15. ¿Con qué frecuencia te provocas el vómito después de comer?**
- a) Dos veces o más a la semana
- b) Una vez a la semana
- c) 2-3 veces al mes

- d) Una vez al mes
- e) Menos de una vez al mes o nunca
- 16.** ¿Cuál de las siguientes afirmaciones describen tus sensaciones después de un atracón?
- a) No me doy atracones
- b) Me siento bien
- c) Me siento un poco disgustado conmigo mismo/a
- d) Me siento bastante disgustado conmigo mismo/a
- e) Me odio a mí mismo/a
- 17.** Como mucho, incluso cuando no estoy hambriento/a.
- a) Muy frecuentemente
- b) Frecuentemente
- c) Ocasionalmente
- d) Algunas veces
- e) Pocas veces o nunca
- 18.** Mis patrones alimenticios son diferentes a los de las demás personas
- a) Siempre
- b) Casi siempre
- c) Frecuentemente
- d) Algunas veces
- e) Casi nunca o nunca
- 19.** He intentado perder peso ayunando o haciendo dietas intensivas.
- a) No durante el año pasado
- b) (b) Una vez durante el año pasado
- c) 2-3 veces durante el año pasado
- d) 4-5 veces durante el año pasado
- e) Más de 5 veces durante el año pasado
- 20.** Me siento triste y deprimido/a después de comer más de lo que había planeado comer.
- a) Siempre
- b) Casi siempre
- c) Frecuentemente
- d) Algunas veces
- e) Casi nunca o nunca
- 21.** En una comilona tiendo a comer alimentos más altos en calorías.
- a) Siempre
- b) Casi siempre
- c) Frecuentemente
- d) Algunas veces
- e) Casi nunca, nunca, o no es aplicable
- 22.** Comparado con la mayoría de la gente, mi habilidad para controlar mi comportamiento al comer parece ser
- a) Mayor que la de los demás
- b) Más o menos igual
- c) Menor
- d) Mucho menor
- e) No tengo control en absoluto
- 23.** Uno de tus mejores amigos de repente sugiere que vayáis los dos a un nuevo restaurante tipo buffet esta noche. Aunque habías planeado cenar algo ligero en casa, aceptas y cenas fuera, comiendo bastante y sintiéndote incómodamente lleno. ¿Cómo te sentirías contigo mismo/a de vuelta a casa?
- a) Bien, encantado/a de haber probado un nuevo restaurante
- b) Un poco apenado/a por haber comido mucho

- c) Un poco decepcionado/a conmigo/a
- d) Triste conmigo mismo/a
- e) Totalmente disgustado/a conmigo mismo/a
- 24.** Actualmente me etiquetaría como un/a “comedor/a compulsivo/a” (alguien que cae en episodios de comer incontrolablemente)
- a) Absolutamente
- b) Sí
- c) Sí, probablemente
- d) Sí, posiblemente
- e) No, probablemente no
- 25.** ¿Cuánto peso has perdido en un mes?
- a) Alrededor de 9 kilogramos
- b) Entre 5.5 y 9 kilogramos
- c) Entre 3.5 y 5 kilogramos
- d) Entre 2 y 3 kilogramos
- e) Menos de 2 kilogramos
- 26.** Si como mucho por la noche me siento deprimido/a por la mañana
- a) Siempre
- b) Frecuentemente
- c) Algunas veces
- d) Casi nunca o nunca
- e) No como mucho por la noche
- 27.** ¿Crees que es más fácil para ti vomitar que para el resto de la gente?
- a) Sí, no supone ningún problema para mí
- b) Sí, es fácil
- c) Sí, es un poco fácil
- d) Más o menos igual
- e) No, es menos fácil
- 28.** Siento que la comida controla mi vida
- a) Siempre
- b) Casi siempre
- c) Frecuentemente
- d) Algunas veces
- e) Pocas veces o ninguna
- 29.** Me siento deprimida inmediatamente después de haber comido mucho
- a) Siempre
- b) Frecuentemente
- c) Algunas veces
- d) Pocas veces o ninguna
- e) No como mucho
- 30.** ¿Con qué frecuencia vomitas después de comer para perder peso?
- a) Menos de una vez al mes o nunca
- b) Una vez al mes
- c) 2-3 veces al mes
- d) Una vez a la semana
- e) 2 veces o más a la semana
- 31.** Cuando comes mucho, ¿a qué velocidad lo haces habitualmente?
- a) Mucho más rápido de lo que la mayoría de la gente haya comido en sus vidas
- b) Mucho más rápido que el resto

- c) Un poco más rápido que el resto
- d) Más o menos igual que el resto
- e) Más despacio que el resto de la gente (o no es aplicable)

32. ¿Cuál es el máximo peso que has ganado alguna vez en un mes?

- a) Alrededor de 9 kilogramos
- b) Entre 5.5 y 9 kilogramos
- c) Entre 3.5 y 5 kilogramos
- d) Entre 2 y 3 kilogramos
- e) Menos de 2 kilogramos

33. Mujeres sólo: Mi último periodo fue...

- a) El mes pasado
- b) Hace dos meses
- c) Hace cuatro meses
- d) Hace seis meses
- e) No he tenido el periodo en los últimos seis meses

34. Uso diuréticos para controlar mi peso

- a) Una vez al día o más
- b) 3-6 veces a la semana
- c) 1-2 veces a la semana
- d) 2-3 veces al mes
- e) Una vez al mes o menos (o nunca)

35. ¿Cómo crees que puede compararse tu apetito con el del resto de gente que conoces?

- a) Muchas veces más grande que el del resto
- b) Mayor
- c) Un poco mayor
- d) Más o menos igual
- e) Menor que el del resto

36. Mujeres sólo: Mi periodo menstrual ocurre una vez al mes...

- a) Siempre
- b) Usualmente
- c) Algunas veces
- d) Casi nunca
- e) Nunca

16.7 BITE QUESTIONNAIRE

The BITE is a questionnaire designed to identify those subjects with bulimic symptoms. It consists of 33 items grouped into two subscales:

- The **Symptom Scale** assesses the number and degree of symptoms that are present. The items of the subscale of symptoms are answered with 'yes/no'.
- The **Severity Scale** provides an index of the severity of the disorder, considering the frequency with which the pathological behaviors are presented. The items of the severity scale are answered according to answers that indicate frequency.

A time frame of the last three months is used to detect possible bulimic patients, and the last month to evaluate the response to treatment. Two total scores are obtained for each scale. In the symptom scale, scores range from 0 to 30. In items 1, 13, 21, and 23, no= 1 point and yes= 0 points. In items 2, 3, 4, 5, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26, 28, 29, 30, 32 and 33, no= 0 points and yes= 1 point. For the symptom scale, scores below 10 indicate absence of compulsive eating behavior; 10-20 points indicate abnormal eating patterns (not necessarily bulimia nervosa); 15-20 points indicate possible subclinical bulimia nervosa; more than 20 indicates highly altered behavior pattern (possible bulimia nervosa).

The score of the gravity scale is obtained from the sum of the points obtained in items 6, 7 and 27. On the severity scale, scores of 5-10 indicate significant severity, and scores above 10 indicate high severity.

Table 16: BITE questionnaire

		SÍ	NO					
1	¿Tiene un horario de alimentación regular?							
2	¿Suele seguir dietas estrictas?							
3	¿Alguna vez se ha considerado un fracaso o una persona?							
4	¿Cuenta las calorías de todo lo que come, incluso cuando no está a dieta?							
5	¿Alguna vez ha tenido una comida completa?							
6	Si es así, ¿con qué frecuencia? <ul style="list-style-type: none"> ○ Días alternos (5) ○ 2-3 veces por semana (4) ○ Un día a la semana (3) ○ Alguna vez (2) ○ Una vez (1) 							
7	¿Utiliza alguno de los siguientes métodos de pérdida de peso?							
		Nunca	Raramente	1 vez/semana	2-3 veces/semana	Diariamente	2-3 veces/día	5 veces/día
	Pastillas para adelgazar	0	2	3	4	5	6	7
	Diuréticos	0	2	3	4	5	6	7
	Laxantes	0	2	3	4	5	6	7
Provocar el vómito	0	2	3	4	5	6	7	
8	¿Su salud se vería seriamente afectada por sus hábitos alimenticios?							
9	¿Crees que tu comida "domina" tu vida?							
10	¿Ha comido y comido alguna vez hasta que desaparecieron las molestias físicas?							
11	¿Hay momentos en los que solo puedes pensar en la comida?							
12	¿Come en frente de otras personas de manera racional y se desvive en privado?							
13	¿Puede dejar de comer cuando se lo proponga?							
14	¿Ha experimentado alguna vez la necesidad de "comer, comer, comer"?							
15	¿Cuándo se siente demasiado ansioso / ansioso por comer?							
16	¿Te aterroriza la idea de engordar?							
17	¿Alguna vez ha comido grandes cantidades de comida, rápidamente (fuera de horario)?							
18	¿Se siente avergonzado o inseguro de sus hábitos alimentarios?							
19	¿Le preocupa tener control sobre "cuánto" come?							
20	¿Es usted un refugiado en la comida que cree que debería?							
21	¿Puede dejar comida en el plato al final de una comida?							
22	¿Engaña a otros con la cantidad que come?							
23	¿Respondes a la sensación de hambre que tienes comiendo?							
24	¿Alguna vez se ha dado un atracón con grandes cantidades de comida?							
25	Si es así, cuando termina de "atracones", ¿se siente "miserable"?							
26	¿Se da "atracones" sólo cuando está solo?							
27	¿Con qué frecuencia ocurren estos «atracones»? <ul style="list-style-type: none"> ○ Raramente (1) ○ Una vez al mes (2) ○ Una vez a la semana (3) ○ 2-3 veces a la semana (4) ○ Diariamente (5) ○ 2-3 veces al día (6) 							
28	¿Me moveré largas distancias para satisfacer la necesidad urgente del "atracón"?							
29	Después de comer mucho, ¿te sientes muy culpable?							
30	¿Alguna vez comes en secreto?							
31	¿Cree que sus hábitos alimentarios pueden considerarse normales?							
32	¿Te consideras un comedor "compulsivo" (no puedes evitarlo)?							
33	¿Pesa más de 2 kg por semana?							

16.8 HOSPITALIZATIONS FOR EATING DISORDERS

In the region of Girona, the treatment of ED in total hospitalization is currently carried out in the Sta. Caterina building in the Parc Hospitalari Martí i Julià, in the URPI for patients under 21 years old. At this level, it is essential to have professionals trained in ED as well as adequate spaces to be able to make a good approach. The target population are individuals that have the diagnosis of ED and meet admission criteria, present comorbidity or vital risk and require intensive treatment(61).

Patients come from both scheduled and unscheduled admissions. The unscheduled admissions, may be patients coming via intensive care unit (unknown for XSM) and who meet admission criteria or for reasons of comorbidity or life risk. The programmed admissions are detailed below:

- Admission may be scheduled by specialized teams of the program of eating disorders located in the sectors when perhaps the diagnosis is confirmed, the severity and difficulty of treatment require full hospitalization.
- Patients admitted to the day hospital that worsens until they meet the criteria for full hospitalization.
- Some patients may be admitted from primary care after evaluation by the specialist teams in the sectors, for their seriousness and/or meeting the criteria for full hospitalization.
- Patients referred from other regional hospitals admitted on an emergency basis due to symptoms associated with a possible eating disorder.

The following are the specific admission criteria:

BIOLOGICAL CRITERIA	PSYCHOPATHOLOGICAL AND SOCIAL CRITERIA
<ul style="list-style-type: none"> ▪ Biological status implying a risk of foreseeable serious complications: no food intake, especially liquids ▪ Severe malnutrition with a body mass index ≤ 15 	<ul style="list-style-type: none"> ▪ Symptomatic depressive and/or severe anxiety associated, autolytic risk, important self-injurious behaviors ▪ Other psychiatric disorders that make treatment difficult in other devices ▪ Uncontrolled self-induced vomiting that cannot be controlled on an outpatient basis ▪ Depressive and/or severe anxiety associated symptomatology, autolytic risk and important self-injurious behaviors ▪ Failure of outpatient and/or day hospital treatment ▪ Concurrent disorders such as severe alcohol and/or other toxic consumption ▪ Severe impulse control

Despite not strictly meeting the criteria specified above, some patients can be assessed to admit:

- Serious alterations in family dynamics that make treatment difficult or interfere with outpatient or day hospital treatment.
- Failure of outpatient and/or day hospital treatment. The patient refuses to follow the established rules: frequency of visits, limitation of physical activity, indicated food...
- Difficulties in accessing the day hospital.