

## Eating disorder risk and psychopathological dimensions

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*An increase in eating disorders and their diversity has been observed over recent decades. Nevertheless, there is a lack of knowledge on the stage that precedes the onset of eating disorders, in which educative programs can prevent successfully these disorders. The present work attempts to describe the relationship between the risk of suffering an eating disorder and certain psychopathological dimensions, and to determine which of these factors contributes to putting the adolescents in a situation where they are at risk of suffering the disorder. A total of 404 students residing in Barcelona, Spain, and aged between 12 and 20 years, were studied. The students were given the Eating Attitudes Test and the Revised Symptom Checklist 90, plus a questionnaire on demographic and family details. A 25.2% risk of eating disorders was detected. This was significantly greater in girls between 12 and 15 years of age, although a high presence of eating disorders risk was detected in males compared to previous studies. It was observed that the group of adolescents at risk of eating disorders has significantly higher levels in all the psychopathological dimensions, mainly phobic anxiety, interpersonal sensitivity and somatisation.*

*Keywords: Eating disorders, adolescents, psychopathology, risk appraisal.*

## Riesgo a los trastornos de la conducta alimentaria y dimensiones psicopatológicas

*En las últimas décadas se ha producido un incremento de los trastornos alimentarios y su diversidad. No obstante, falta más información sobre los estadios precedentes al inicio del trastorno, en los que los programas educativos pueden prevenir exitosamente estos trastornos. El presente trabajo se propone describir la relación entre el riesgo a sufrir un trastorno alimentario*

*y determinadas dimensiones psicopatológicas, y determinar cuáles de estos factores contribuyen en situar a los adolescentes en riesgo a sufrir dichos trastornos. Un total de 404 estudiantes residentes en Barcelona, España, con edades entre los 12 y los 20 años fueron estudiados. Los estudiantes completaron el Test de actitudes alimentarias y el Symptom Checklist 90 (SCL 90), además de un cuestionario demográfico con detalles familiares. Un total de 25.2% de riesgo hacia el trastorno alimentario fue detectado. Este riesgo fue mayor en chicas de entre los 12 y los 15 años, aunque también se detectó un alto porcentaje de riesgo entre chicos comparado con estudios anteriores. Se observó que el grupo de riesgo obtuvo puntuaciones significativamente superiores en todas las dimensiones psicopatológicas, especialmente la ansiedad fóbica, la sensibilidad interpersonal y la somatización.*

*Palabras clave: trastornos alimentarios, adolescentes, psicopatología, evaluación del riesgo.*

## **Introduction**

There is currently an increase not only in eating behaviour disorders but also in the diversity of these disorders. Eating disorders are relatively common in adolescents.

Today the importance of identifying eating disorders and intervening as early as possible is not disputed. However, early intervention has to be supported by knowledge about the stage that precedes the appearance of the eating disorders, and especially, how teenagers get to be in a risk situation.

There is evidence of the previous presence of obesity as a circumstance that increases the risk of the disorder (Kaluski, Natamba, Goldsmith, Shimony, & Berry, 2008). Most people with eating disorders and body dissatisfaction have identified these as a predictor of eating disorders (Petrie, Greenleaf, Reel & Carter, 2009; Miró, Raich & Portell, 2006). Self-esteem would be a protective factor for body dissatisfaction and would therefore be a key aspect that preventive actions should address (Beato-Fernández, Rodríguez-Cano, Belmonte-Llario, & Martínez-Delgado, 2004).

Gerner and Wilson (2005) found that poor friendship relationships predict weight concerns and dietary restraint in young adolescents. The difficulties in emotional and psychosocial functioning found in clinical cases with eating disorders would support the need for interventions aimed at adolescents' interpersonal relationships (Petrie, Greenleaf, Reel, & 2009; Svaldi, Griepenstroh, Tuschen-Caffier, & Ehring, 2012; Zucker et al., 2013).

Blodgett, Gondoli, Corning, Bucchianeri and Godinez (2009) suggest that maternal attitudes addressed to psychological control of girls could favour the development of bulimic symptoms. Eating disorders among adolescents require specific intervention involving the family's ability to cope with the problem, in order to prevent this from becoming the main factor maintaining the pathological behaviour (Morandé, 2009; Linville, Stice, Gau, & O'Neil, 2011).

Several studies point to the coexistence of psychopathological symptomatology and eating disorders (Wildes & Marcus, 2013). One type of symptomatology that has been observed in people with eating disorders is anxiety and depression (Büyükgöze-Kavas, 2007; Calderon, Moreno, Gili, & Roca, 1998), accompanied by impulsivity, guilt, self-injurious behaviour and feelings of self-rejection (Ahren-Moonga, Holmgren, Knorrning, & Klinteberg, 2008; Claes et al., 2012). However, other researchers point out that feelings of self-rejection are more strongly related to eating disorders than are mere symptoms of depression (Presnell, Stice, Seidel, & Madeley, 2009; Sawdon, Cooper, & Seabrook, 2007) and depressive symptoms becomes more evident depending on the degree to which the disorder is structured (Godart et al., 2006; Fletcher, Kupshik, Uprichard, Shah, & Nash, 2008, Green et al., 2009). Anxiety has been reported as a predisposing factor for both bulimia (Haye, Bulik, Thornton, Barbarich, & Masters, 2004; Procopio, Holm-Denom, Gordon, & Joiner, 2006) and for anorexia (Haye, et al., 2004; Strober, Freeman, Lampert, & Diamond, 2007). On an emotional level, anxiety would lead adolescents to overestimate the degree of preoccupation related to the shape and weight of their body. In fact anxiety and social phobias are also present both in anorexia and in bulimia (Godart et al, 2006; McLean, Miller, & Hope, 2007). In non-Western countries the association of eating disorders with psychopathological symptoms such as depression is also corroborated (Katsounari, 2009).

Obsessive-compulsive traits have also been associated with anorexia and bulimia nervosa (Sallet et al., 2010) and with a negative prognosis for these (Crane, Roberts, & Treasure, 2007). Furthermore these traits play a mediating role in treatment results (Morgan, Wolfe, Metzger, & Jimerson, 2007). The level of obsessiveness is related positively to the severity of eating symptomatology (Bachar, Gur, Canetti, Berry, & Stein, 2010; Nilsson, Sundbom, & Hägglöf, 2008, Petrie, Greenleaf, Reel, & Carter, 2009).

However, it remains to be seen whether these psychopathological symptoms are found in teenagers who just peek the risk of eating disorders, and whether such symptoms contribute to the structuring and further development of eating disorders. The aim of this study is to analyse the relationship between the presence of a broad spectrum of psychopathological symptomatology and risk before the onset of eating disorder at puberty. Understanding these relationships will enable us to design programmes for preventing the disorder in the early stages of its development.

## **Material and methods**

### ***Sample***

The sample used in this study is an opportunity sample consisting of 404 subjects from two educational centres, with studies at all educational levels, in the urban centres of Sabadell and Cornellà, Spain.

The data covered young people from this centre aged from 12 to 20 years. Specifically the sample consisted of 150 young people aged between 12 and 14 years, 203 young people aged between 15 and 17 years, and 49 young people aged between 18 and 20 years.

The sample was made up of 207 boys and 196 girls. Most of the young people were attending obligatory secondary education (240), while 98 young people were attending baccalaureate studies, and 65 professional training.

### ***Instruments***

We used the EAT (40-Item Eating Attitudes Test) (Garner & Garfinkel, 1979) validated for the Spanish population (Castro, Toro, Salamero, & Guimerá, 1991). This 40-item test identifies the presence of an eating disorder risk. For the study, 20 points were considered as an indicator of the presence of risk as suggested by the validated version for Spain (Castro et al., 1991), to ensure the detection of subjects really at risk and remove the possibility of false positives as much as possible. The analysis of the items comprising the EAT allowed us to identify a subset of items that describe behaviour without necessarily assuming even the presence of anorexia, bulimia or other eating disorders advertise itself the initial stage of pathology in eating behaviour:

- 13. *Vomit after I have eaten*
- 14. *Feel extremely guilty after eating*
- 17. *Weigh myself several times a day*
- 25. *Am preoccupied with the thought of having fat on my body*
- 28. *Take laxatives*
- 38. *Like my stomach to be empty*
- 40. *Have the impulse to vomit after meals*

This is why the presence of such behaviour was considered operationally as an integral part of an indicator of the commencement of the disorder structuring. The Revised Derogatis Symptom Checklist (SCL-90-R) was also applied (Derogatis, 1983). This test of 90 symptoms, adapted for the Spanish population (González de Rivera, De las Cuevas, Rodríguez, & Rodríguez, 2002) contains information on 10 types of symptoms: somatisation, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and an additional scale (with 7 items that cannot be assigned to any dimension from a psychometric perspective).

Lastly, subjects also answered a questionnaire on demographic and family details, which provided information about age, sex, school year, school popula-

tion and age of first menstruation, as well as the adolescents' perception of family harmony and their parents' satisfaction as a couple.

The procedure was in agreement with the ethics' code of good scientific practice of the ethic committee of Universitat Autònoma de Barcelona, and was approved by the Regidoria d'assumptes socials i de salut of Cornellà Council. Parents of the participants were informed by mail and their consent was demanded.

### ***Data analysis***

Descriptive tests, t-test, variance analyses, correlations and regressions were carried out using SPSS program for PC.

## **Results**

### ***Eating disorder risk***

Considering the 20 cut-off point established by Castro et al. (1991), it was found that 25.2% of the sample would be at risk of having an eating disorder and 74.8% not at risk.

Girls showed higher scores on the EAT (17.04) and the indicator structuring (1.54) than boys (11.28 and 0.65, respectively;  $p < 0.001$ ). A greater number of girls (36.6%) than boys (13.6%) exceeded the cut-off point of 20, which would indicate that they are at risk of suffering the disorder (chi-square = 22.86,  $p < 0.001$ ).

The risk scores change along the different age groups range from 11.3 to 18.5. Youths of 14 and 15 years old have the higher scores (17 and 18.5). Nevertheless, there was a very weak negative correlation between age and risk ( $r = -0.12$ ,  $p < 0.05$ ), and a positive correlation between progress and the structuring of the disorder indicator ( $r = 0.11$ ,  $p < 0.05$ ).

The average of the body mass oscillated between 12.55 and 37.65 (mean 21.97 and SD 3.49). Weak correlations were found between BMI and the risk level ( $r = 0.20$ ,  $p < 0.001$ ) and also with the level of structuring of the disorder ( $r = 0.17$ ,  $p < 0.01$ ). Youths that exceeded the cut-off point of 20 have higher BMI than those who doesn't (22.9 vs 21.7,  $p < 0.01$ ).

Variance analysis indicated significant differences on the risk score and risk structuring depending on different educational levels, with obligatory secondary education students having higher scores ( $x = 15.7$   $x = 1.3$ , respectively), students undergoing training courses ( $x = 12.6$   $x = 0.8$ ) and baccalaureate students ( $x = 11.7$   $x = 0.8$ ,  $p < 0.05$ ).

### ***Eating disorder risks and psychopathological dimensions***

Both the level of risk and the eating disorder structure indicator were highly correlated with the overall Index of symptoms ( $r = 0.47$  and  $r = 0.41$ ,  $p < 0.001$ , respectively) and with all types of symptomatology.

The additional scale resulted in the highest correlation, but since it includes questions related to food intake, it was not considered when interpreting the results.

The strongest correlations with general risk were observed in interpersonal sensitivity ( $r = 0.46$ ,  $p < 0.001$ ), phobic anxiety ( $r = 0.45$ ,  $p < 0.001$ ), and somatisation ( $r = 0.45$ ,  $p < 0.001$ ).

The strongest correlations with the structuring of the disorder indicator involved interpersonal sensitivity ( $r = 0.40$ ,  $p < 0.001$ ), obsessive compulsive behaviour ( $r = 0.39$ ,  $p < 0.001$ ) and somatisation ( $r = 0.38$ ,  $p < 0.001$ ) (see table 1).

TABLE 1. CORRELATIONS BETWEEN PSYCOPATHOLOGICAL DIMENSIONS AND EATING DISORDERS RISK.

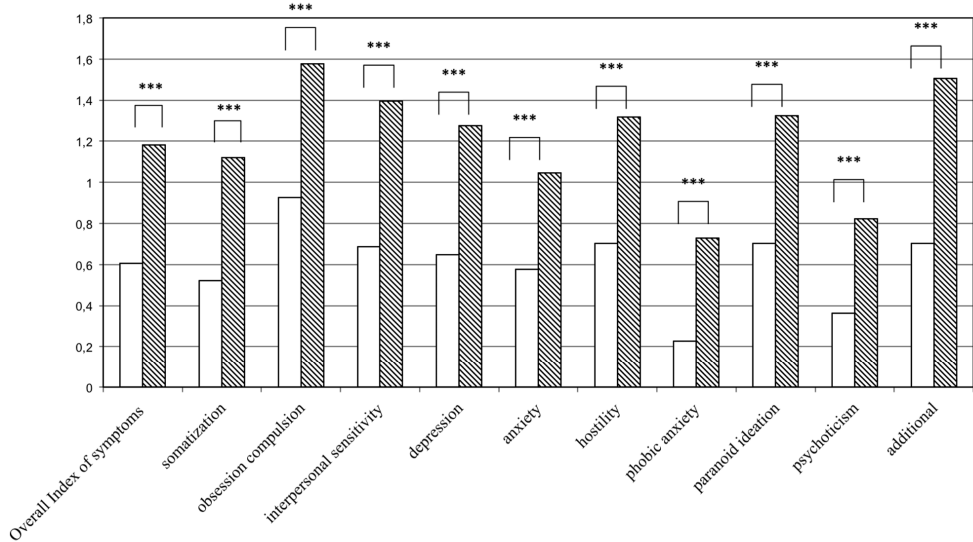
	<i>Level of risk to have the eating disorder</i>	<i>Eating disorder structure indicator</i>
Overall index of symptoms	0.47***	0.41***
Somatisation	0.45***	0.37***
Obsession compulsion	0.40***	0.38***
Interpersonal sensitivity	0.45***	0.40***
Depression	0.40***	0.35***
Anxiety	0.37***	0.32***
Hostility	0.35***	0.32***
Phobic anxiety	0.44***	0.33***
Paranoid ideation	0.38***	0.36***
Psychoticism	0.38***	0.34***
Additional	0.52***	0.44***

Note. \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$

The mean comparison test revealed that the risk sub-group (greater than the cut-off point 20) most frequently presented all the evidence considered in psychopathological symptoms ( $p < 0.001$ ) (see figure 1, next page).

Regression analysis indicated that 32.3% of the variability in eating disorder risk, as measured by the EAT, was explained by the set of SCLD tests on psychopathological dimensions (adjusted  $R^2 = 32.3$ ,  $F(10, 268) = 14.25$ ,  $p < 0.0001$ ), confirming the specific impact of psychopathology on the onset and subsequent development of eating disorders. The components that contribute most to explaining

the scores are: phobic anxiety, interpersonal sensitivity, somatisation and depression. These four psychopathological dimensions explain 27.6% of the variability of the risk variable, with phobic anxiety alone explaining 22.5% of the variability.



Nota: \*\*\*  $P < 0.001$

Figure 1. Differences between with and without risk groups in psychopathological dimensions.

TABLE 2. REGRESSION COEFFICIENTS.

<i>Psychopathologic symptoms</i>	<i>Standardized coefficients</i>
Somatization	0.159***
Obsession compulsion	-0.017 (p=0.07)
Interpersonal sensitivity	0.257*
Depression	-0.218*
Anxiety	-0.088
Hostility	-0.044
Phobic anxiety	0.266***
Paranoid ideation	0.015
Psychoticism	-0.133
Additional	0.410***

Note. \*  $P < 0.05$ ; \*\*  $P < 0.01$ ; \*\*\*  $P < 0.001$ .

Regression analysis also showed that the scores on the SCLD subtests explained 22.5% of the observed variability in the Structuring Disorder index (adjusted  $R^2 = 22.5$ ,  $F(10, 317) = 10.48$ ,  $p < 0.001$ .) The psychopathological dimensions that would best explain the results in this indicator would be phobic anxiety and the additional scale. Phobic anxiety explained 22.2% of the variability.

### **Limitations of the study**

This study has been carried out with a limited sample from two educational centers. This must be taken into consideration when the results are transferred to other contexts, nevertheless the results are in agreement with other studies, and this strengthens the relationship between psychopathology vulnerability and eating disorder. Another limitation that must be considered is the Derogatis Symptom Checklist. This checklist is a good screening instrument, but doesn't have diagnose validity itself. However, this study aims to explore the relationship of the eating risk and psychopathology symptoms than can indicate vulnerability, but not psychopathological diseases.

### **Discussion**

#### ***Determining eating disorders risk levels***

Our risk subjects account for 25% of the total sample. Of this 25%, about 17% is attributable to girls and about 8% to boys, reflecting a strong similarity to the overall prevalence of ED risk in other Spanish and European populations (Roy, Lopez, Galán, & Del Castillo, 2004; Ruiz, 2005). In fact, the incidence among girls aged 15 to 19 years of age has almost doubled in a decade, from 56.4 to 109.2 per 100,000 (Van Son, Van Hoek, Bartelds, Van Furth, & Hoek, 2006).

Several researchers have warned of its future increase not only in middle or upper middle classes, but also in lower socioeconomic strata (Gentile, Raghavan, Rajah, & Gates, 2007; Power, Power, Canadas, & 2008; Van Hoeken, Veling, Smink, & Hoek, 2010), and in other cultures such as China (Tao, 2010).

#### ***ED risk and gender***

While girls make up almost a third of the eating disorders risk percentage, the percentage of boys at risk is remarkably high compared with previous studies in Spain (as already mentioned) and in the USA (Strober et al., 2006).

This shows that male vulnerability to eating disorders is particularly high in the study sample. This growing trend in boys has been reported by other researchers (Crisp et al. 2006; Lavender & Anderson, 2010; Roy et al., 2004).



The scientific literature tells us that in almost every aspect there are very few differences between the sexes in the way in which eating disorders are suffered. It only emphasises that such disorders in boys seem to be preceded by disturbances in the form of psychiatric manifestations associated with overprotection and family conflicts (the latter being also present in females) and gender identity conflicts, often masked by eating pathologies (Crisp et al., 2006, Strober et al., 2006; Wichstrøm, 2006).

Considering these references, it is particularly interesting to note that in the same group of adolescents in which we observed a high percentage of nourishment risk in boys, there is also a great deal of psychopathology associated with the risk of eating disorders.

### ***Eating disorders risk (EAT) and psychopathological symptoms (SCLD)***

In this study we have confirmed the relationship between the risk of developing an eating disorder and psychopathological vulnerability (generalised and non-specific). It has been observed that the subgroup of adolescents at risk of eating disorders (in a supposedly healthy population) have significantly higher levels in all psychopathological dimensions compared with those who are not at risk.

There is a strong presence of anxiety, especially phobias, in adolescents at risk of eating disorders. These results are consistent with those signs that indicated the presence of a psychopathological (Godart et al., 2006; McLean et al. 2007; Procopio et al.; 2006; Strober et al., 2007; Swinbourne & Touyz, 2007). In fact, some researchers claim that when adolescents begin a diet spurred on by feelings of anxiety and distress, the risk of an ED rises sharply (Isomaa, Isomaa, Marttunen, Kaltiala-Heino, & Björkqvist, 2010).

Similarly, the relationship found in this study between the presence of obsessive-compulsive symptoms in adolescents at risk and eating disorders is also consistent with the discovery of these symptoms in people with eating disorders (Crane et al. 2007; Sallet et al. 2010). The same applies to interpersonal sensitivity, also associated with EDs by Gerner and Wilson (2005).

The combination of anxiety and depression in the presence of overweight has been identified as favouring the appearance of eating disorders (Goossens, Braet, Van Vlierberghe, & Mels, 2009). In fact in this study the group at risk has higher BMI than the group that is not at risk. According to Godart et cols (2006), depressive symptoms occur with the onset of the disorder, with very low intensity in the risk-contracting period, the period on which the present work focuses, which would explain the negative direction of the contribution of depression in the onset of risk found by the authors.

The results also support the relationship between the risk of eating disorders and depression symptomatology. The presence of depression in eating disorders

seems to depend heavily on the adolescent's age and the length of time the disorder has been evolving, and once installed it makes depression have greater responsibility for their variability, thus mutually contributing to each other (Green et al. 2009; Presnell et al. 2009) specially when, as adolescents, in addition to being depressed, they do not accept the way they are (Sawdon et al. 2007).

Sallet and cols (2010) found evidence of a major co-morbidity (obsessive-anxious-depressive illness) after the ED is structured, and Finzi-Dottan and Zubery (2009) suggest that such co-morbidity requires a period of restructuring, so that this varied symptomatology would develop before being diagnosed with an ED and continue afterwards. This is consistent with the so-called negative effect aimed at the body, which is part of that co-morbidity observed in the work of McLean and cols (2007), and by a team of Spanish scientists (Calero-Elvira et al., 2009). In this sense, some studies have linked this disorder with a negative effect and difficulties in managing, regulating and/or inhibiting emotions (Czaja, Rief & Hilbert, 2009; Fox & Power, 2009; Lavender & Anderson, 2010).

The significant relationship of interpersonal sensitivity increases with the risk of ED, especially if it is accompanied by other psychopathological manifestations. For the authors this is indicative of a possible failure in this group of teenagers' specific resources to develop good interpersonal relationships in their reference group. The difficulties in psychosocial functioning found in clinical cases with eating disorders supports the need for interventions in adolescents' interpersonal relationships (Green et al., 2009).

The contribution of somatisation in the appearance of ED risk, demonstrates, on the other hand, a possible poor management of emotions, a fact which precedes the onset of the disorder, as reported by Czaja and cols (2009) and Fox and Power (2009), and Lavender and Anderson (2010).

Somatic manifestations are not risk generators *per se*, but the lack of an adequate emotional regulation to support them explains precisely the somatic alteration in a situation of conflict, also associated with strong body dissatisfaction and an expectation model conforming to a particular body aesthetic (Green et al., 2009; Jiménez & Silva, 2010).

The authors claim that the emergence of ED risk in this sample is explained in 32.3% of cases by the presence of various psychopathological symptoms such as anxiety, anomalies in interpersonal relationships and somatisation, in the presence of low levels of depression.

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