Prevalence and comorbidity of eating disorders among a community sample of adolescents: 2-year follow-up

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ABSTRACT

The previous literature about comorbidity between eating disorders (ED) and other DSM-IV psychiatric disorders in adolescence has employed cross-sectional studies with clinical samples, where the comorbid disorders were diagnosed retrospectively. The present study aims to overcome these limitations by the analysis of comorbidity in a community population during 2-year follow-up. A semi-structured interview was applied to a teenager sample. Firstly, a cross-sectional and non-randomized study on psychiatric morbidity was conducted with 993 teenagers between the ages of 12 and 16 from five schools. Secondly, 326 students between 14 and 17 years old of one school were reassessed 2 years later in order to detect ED new cases and find associations with previous psychiatric disorders. The ED prevalence was 3.6%. Cross-sectional analysis revealed that 62.9% of individuals with an ED had comorbid disorders: anxiety disorders (51.4%), Attention Deficit Hyperactivity Disorder (31.4%), oppositional defiant disorder (11.4%), and obsessive compulsive disorder (8.6%). Prospective longitudinal analysis showed an ED incidence rate of 2.76% over the course of 2 years. 22.2% of new cases had received previous psychiatric diagnoses, of which all were anxiety disorders. Thus, ED exhibited a high comorbidity rate among adolescent populations and anxiety disorders were the most common comorbid diagnosis.

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1. Introduction

Eating disorders (ED) are considered as severe mental illnesses. Their onset typically occurs in adolescence and their development is usually characterized by a deterioration in the daily life of patients, both physically (ED is at this time the major psychiatric disorder associated with the highest risk of mortality) and functionally (Herzog et al., 2000; Birmingham et al., 2005; Papadopoulos et al., 2009).

One of the main reasons for the impact of ED on long-term evolution is their association with other psychiatric disorders—keep in mind that only half of the patients with anorexia nervosa (AN) recovers, and they have a high rate of relapse and mortality (Steinhausen, 2002; Swanson et al., 2011). Recent comorbidity studies found that between 51% and 93% of individuals with an ED reported comorbid psychiatric diagnoses (Herpertz-Dahlmann et al., 2001; Milos et al., 2003).

Mood disorders, anxiety disorders, and substance use disorders have the highest comorbidity with ED. The comorbidity rate of anxiety disorder and ED is 25–75% for bulimia nervosa (BN) and 23–54% for AN (Godart et al., 2002; Milos et al., 2003; Kaye et al., 2004; Pallister and Waller, 2008). The lifetime prevalence for mood disorders also varies considerably, and the comorbidity rate is between 24.1% and 90.5% for BN, and between 31% and 88.9% for AN (Milos et al., 2003; Godart et al., 2006; Herzog and Eddy, 2007).

Most ED comorbidity studies published to date have been carried out with adults. Despite ED have the highest prevalence in adolescence, studies focusing on this population are scarce. Moreover, the findings of these studies have to be interpreted cautiously due to their methodological limitations. Firstly, the clinical origin of the samples involves a representativeness bias among the ED patients that hinders the generalization of their results. According to Godart et al. (2002), many of these studies

may have accessed to clinical units for other psychiatric disorders and not only for ED; this may shed overestimated rates of comorbidity. Secondly, these studies are usually cross-sectional studies, which make it difficult to elucidate the true nature of the association between different diagnostics and ED, that is, whether comorbid disorders are the consequence of ED or, conversely, are risk factors for their onset and/or maintenance (Patton et al., 2008; Wentz et al., 2009). Thirdly, comorbid disorders are also usually diagnosed retrospectively. This may hinder the reliability of results due to memory bias, social desirability in responses, and other factors. Fourthly, while most studies have obtained the clinical information based on self-administered questionnaires, the research based on personal diagnostic interviews is scarce. Finally, the absence of a control group is often a critical limitation, and if control group is present, it is not usually matched with the experimental group on relevant variables such as age or sex. If we do not take into account the age of the patients, estimation and generalization could become wrong because both ED and other psychiatric disorders have different prevalence at different stages of life. Similar mistakes could also arise if we do not consider sex differences.

The study of ED comorbidity is important for at least two reasons: (i) to better characterize the associated symptoms, which may clinically improve therapeutic efficacy; (ii) to identify potential risk factors and so enable a preventive therapeutic approach.

To date, there are relatively few ED comorbidity studies in community samples of adolescents. The most representative studies (e.g., Zaider et al., 2000; Hudson et al., 2007) have been conducted in North American populations. However, the cross-sectional nature of these studies does not allow finding causal associations between ED and other psychiatric illnesses. Follow-up designs in community samples of adolescents are exceptional. The low incidence rate of ED makes it imperative to have very large samples in order to analyze comorbidity with enough statistical power. If we bear in mind the effort of assessment with standardized diagnostic measures in different periods, and the high economic cost it entails, it is easy to understand the scarcity of such studies.

Our study analyzes both cross-sectional comorbidity and prospective longitudinal comorbidity (after 2 years) between ED and other DSM-IV Axis I psychiatric disorders in a sample of adolescents from the community. A standardized psychiatric interview was applied to a large sample of students ($n=962$). A part of this sample ($n=326$) was re-evaluated after 2 years using the same interview. In the second assessment, we analyzed the psychiatric morbidity in new cases of ED. This is the first study of psychiatric comorbidity in ED that uses this design in our particular environment, where, to our knowledge, there is no other prospective study with these features.

2. Methods

2.1. Participants

This study included two different periods and two different analyses. First of all, a study of psychiatric morbidity was conducted on a community population of adolescents from five public secondary schools in Valencia (Spain).

Each school's participation was voluntary. Parental informed consent was obtained for all participants. The inclusion criteria were that the students should be from 12 to 16 years of age and be attending class on the day the diagnostic interviews were conducted.

The network of public secondary schools in the region is designed so that each borough meets demand resulting from primary education. In each borough where there are more than 150 pupils has to have at least one school. Furthermore, most private secondary schools have agreements by which they form part of the public network; hence, they admit students only from a given geographic area (such as a district or part of a borough). In the boroughs considered in our study, there are no fully private schools and so, all students are enrolled in the public education network.

When there is only one secondary school, its pupils represent practically all the pupils in that geographical area. This was the case with three of the schools in our study (borough 1: 8918 inhabitants, population density 1604 inhab/km², borough 2: 16,738 inhabitants, population density 1887 inhab/km², and borough 3: 8367 inhabitants, 116 inhab/km²).

The other two public schools were in the same borough (borough 4: 27,175 inhabitants and a population density of 2073 inhab/km²) and represent 74.2% of all secondary school places in this municipality. Most of the remaining places (25.8%) belong to other schools in the public network. Thus, our sample is representative of this borough's secondary schoolchildren due to: i) nearly 75% of the borough's schoolchildren were included; and ii) there were no private schools which could potentially attract students with different sociodemographic characteristics. All of the boroughs are close together (less than 30 km apart) and very accessible to and from the provincial capital. Their economy, in all cases, is mixed, with a predominance of the service, industrial, and construction sectors, as is, generally, the case in the region of Valencia. None of the participating schools were in a geographical area of predominantly rural activity. Although the boroughs are small, their population density, with one exception, is high. This is due to extensive fragmentation in the boroughs on the outskirts of the provincial capital.

The total sample of school pupils comprised 993 children from 12 to 16 years of age, of whom 26 (2.6%) could not be assessed and five were excluded due to database errors. The final sample comprised 962 subjects, 52.2% males ($n=502$) and 47.8% females ($n=460$).

The nutritional state was determined according to age and sex. Thus, BMI-for-age Spanish tables were employed (Sobradillo et al., 2004) in order to provide an adequate BMI for teenagers, which follow similar rules to the Centers for Disease Control and Prevention (Department of Health and Human Services, USA). Underweight was defined as a body mass index (BMI) percentile for age < 10; overweight was defined as a BMI percentile for age 90–97 and obesity was defined as a BMI percentile for age > 97. The overall sample was qualified as follows: 10.2% of the total sample showed underweight (12.8% girls and 7.4% boys), most adolescents (80.3%) were in normal weight (79.5% girls and 81.2% boys), 6.9% showed overweight (1.3% girls and 4% boys), and 2.6% were obese (1.3% girls and 4% boys). In addition, the clinical cases were qualified as follows: 9.1% of the cases showed underweight, 81.8% were in normal weight, and 9.1% showed overweight.

After 2 years, we applied the same semi-structured psychiatric interview in one of the schools to detect new cases of ED and evaluate their association with previous psychiatric disorders. Only one of the schools accepted to participate. The number of students re-evaluated was 326 (65 students were lost due to changed of school). Their age in the follow-up period was between 14 and 17 years old (median age: 14.9 ± 0.7), 50.9% males ($n=166$) and 49.1% females ($n=160$).

2.2. Measurement instrument

We used the "Kiddie Schedule for Affective Disorders and Schizophrenia" (K-SADS; Ambrosini, 2000) semi-structured interview, in its epidemiological version, suitably adapted to Spanish (Bonet Pla, 1991).

The 14 participating interviewers included clinical psychologists and psychiatrists from various Mental Health Units; all with considerable experience in the assessment and diagnosis of mental disorders. The interviewers were given specific training in the application of the K-SADS.

In the K-SADS correction, we have introduced specific instructions in order to diagnose AN or BN full-syndrome, partial-syndrome (i.e., those that met AN Criteria B and C, but not A or D; or those that met BN Criteria A1, B, D, and E, but not A2 or C), and subclinical ED (i.e., those that met AN Criteria B and C, but neither A nor D; or those that met BN Criteria A1, B, D, and E, but neither A2 nor C (Cotrufo et al., 1997).

2.3. Statistics

Statistical analyses were performed with the statistical package SPSS for Windows, version 15.0. The existence of significant associations between diagnosis of ED and other diagnoses was calculated from the relative risk (RR) estimate and its 95% confidence interval (CI). The RR estimate is a measure of association between the presence or absence of a factor and the occurrence of an event. A 95% CI for the RR that is above 1 implies an increased risk, which means that there is a significant difference in the presence of other psychiatric disorders.

3. Results

3.1. ED prevalence

ED prevalence in the student population during the first clinical evaluation according to broad DSM-IV criteria was 3.6% (35 cases). Two cases showed AN full-syndrome (one restrictive and one purgative), 15 AN partial-syndrome, 15 subclinical AN and three