Full Length Research Paper

Prevalence of major depressive disorder among Spanish adolescents

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The main objective of this study was to examine the prevalence of major depressive disorder (MDD) among adolescents in a city of 200,000 inhabitants using a psychiatric diagnostic tool. We also looked into how possible internal/external factors may influence prevalence and examined the comorbidity between MDD and other psychiatric disorders. The study population included 1,238 adolescents in their final year of secondary education in Sabadell (Barcelona, Spain). A prospective observational study in two phases: (a) Initial population-based screening using the Beck Depression Inventory (BDI), and (b) Diagnosis using the Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS) with participants who, according to screening, exhibited significant depressive symptoms. The Child Behavior Check-list (CBCL) and the State-Trait Anxiety Inventory for Children (STAIC) were also used in the second phase of the study, which, together with K-SADS, enabled us to examine the comorbidity of MDD with other disorders. According to the initial screening, 7.92% of participants exhibited significant depressive symptoms. The results of the diagnostic interviews showed a prevalence of 1.29% adolescents with MDD. Prevalence was higher in girls (1.92%) than in boys 0.34%) (p=0.002) and at age 16 or over in both genders (p<0.001). 50% of participants with MDD presented comorbidity with other psychiatric pathologies. The low prevalence of MDD observed does not justify generalised screening in adolescents attending school, except in cases of individuals with significant depressive symptoms.

Key words: Depression, major depressive, disorder, adolescence, prevalence, screening, comorbidity.

INTRODUCTION

Major depressive disorder (MDD) is one of the most common (15 to 20%) and debilitating psychiatric disorders observed in primary care settings (Achenbach, 1978; Sanz et al., 2003). In children and adolescents,

depressive disorders are the second most prevalent diagnosis in Spain, after conduct disorders (Alaéz et al., 2000). Given the high risk of recurrence and chronicity associated with MDD, early diagnosis and intervention is highly recommended to prevent complications (Fergusson and Woodward, 2002; Lewinsohn et al., 1999; Pine et al., 1998). In fact, MDD has been identified as one of the main risk factors for suicide (Ezpeleta et al., 2008). According to the National Institute of Statistics (Instituto Nacional de Estadística, 2008), the total number of suicides in Spain in 2009 was 3,650, almost 5% of whom were adolescents. Consequently, suicide has become the leading external cause of death among adolescents in Spain.

Epidemiological studies in the field of adolescent MDD are usually performed using two distinct methodological approaches: (a) Screening studies, aimed at assessing the degree of depressive symptoms in a specific population or (b) diagnostic tools whose purpose is to estimate the prevalence of MDD using CIE-10 (Organización Mundial de la Salud, 1992) or DSM-IV (American Psychiatric Association, 1994) diagnostic criteria. Although the optimal strategy for assessing the prevalence of MDD would be the use of structured psychiatric diagnostic interviews, current practice favours the implementation of massive screening of specific populations. Such massive screening fails to establish the real prevalence of MDD, and merely offers an estimation of its risk.

Depression screening studies, also referred to as "risk screening", show highly varied results. This may be attributed to several causes such as: The choice of diagnostic tool, the different diagnostic criteria applied, or individual differences among respondents or the characteristics of the reference population. Investigations carried out on the epidemiology of adolescent depression that used self-report questionnaires yield higher rates. Thus, in a study carried out on a sample of Mexican adolescents who were administered the Beck Depression Inventory (BDI) (Beck et al., 1961), the percentage of participants with significant depressive symptoms was 18.6% (Martínez et al., 2006). Nevertheless, the same questionnaire was administered to Argentinean adolescents, and prevalence reached 25% (Czernik et al., 2006). Similarly high rates have been reported in studies from other countries (De la Peña et al., 1999; Escriba et al., 2005).

In Spain, the results yielded have been inferior to those described in these studies: 10.29% of Spanish adolescents aged 12 to 16 years presented significant depressive symptoms (Escriba et al., 2005). Other authors, such as Canals et al. (1995) also observed that hetero-administered screening tools increase specificity and yield lower percentages. In their study, Canals et al used the Children's Depression Rating Scale-Revised (CDRS-R) (Poznanski et al., 1984) and the results obtained showed that 2.3% of adolescents aged 13 to 14

years and 3.4% of youths aged 17 and 18 years had significant depressive symptoms.

On the other hand, diagnostic studies using psychiatric diagnostic interviews such as the DSM-IV or ICD-10 have estimated the prevalence of MDD among adolescents in Spain to be between 2.8 and 5% (Canals et al., 1997; Ezpeleta et al., 2007). International investigations, such as the extended meta-analysis by Costello et al. (2006), who pooled 26 epidemiological studies of adolescent depression, estimated the prevalence at 5.6%. These figures are closer to the 5.8% observed in a Swedish population study carried out by Olsson and Von Knorring (1999).

Diagnostic tools that examine the entire population of a city are scarce. In Spain, one of the few examples of population research was conducted in a small town near Barcelona, which observed that 5% of 15-year-old adolescents met the criteria for MDD (Ezpeleta et al., 2007). Nevertheless, this study presented one limitation; although it was population-based, the number of participants was reduced (n=151).

Diagnostic studies identified differences in prevalence of MDD by sex (Martínez et al., 2006) and age (Modrzejewska and Bomba, 2009). The incidence of this psychiatric disorder, similar in primary school-age boys and girls, tends to increase during adolescence, with a female/male ratio of 2:1, as demonstrated by De la Peña et al. (1999) and Ulloa et al. (2006). Other research indicated that the proportion of MDD in this age group was up to 4 times higher in girls than in boys (Olsson and Von Knorring, 1999). Family history of depression was reported by Klein et al. (2001) and recent published studies show relationship between family history of affective disorders and CBCL to develop psychopathology in high risk adolescents (Simeonova et al. (2015).

Furthermore, depressive disorders are frequently comorbid with other psychiatric conditions. A study in a community sample performed by Essau (2008) detected that 58% of depressed adolescents in a community sample and 63.5% in a clinical sample presented some disorder comorbid with MDD, based on the computer-assisted personal interview (CAPI) (Wing et al., 1990). Greater comorbidity was found between depression and anxiety disorders. The results showed that 72% of the community sample and 62 % of the clinical sample presented comorbid anxiety. Depression was also shown to be often accompanied by Attention Deficit Hyperactivity Disorder (ADHD) (Biederman et al., 1996), and eating disorders which causes high morbidity, disability and a worse long-term prognosis (Blackman et al., 2005).

Given the high prevalence of MDD and associated morbidity, the European Alliance Against Depression (EAAD) was founded in 2004, and now operates in 18 countries. The aim of this programme is to develop multilevel interventions to improve the treatment of

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                        │           Sabadell          │
                        │ 34 centres of obligatory     │
                        │ secondary education          │
                        │ (last course; n= 2395)      │
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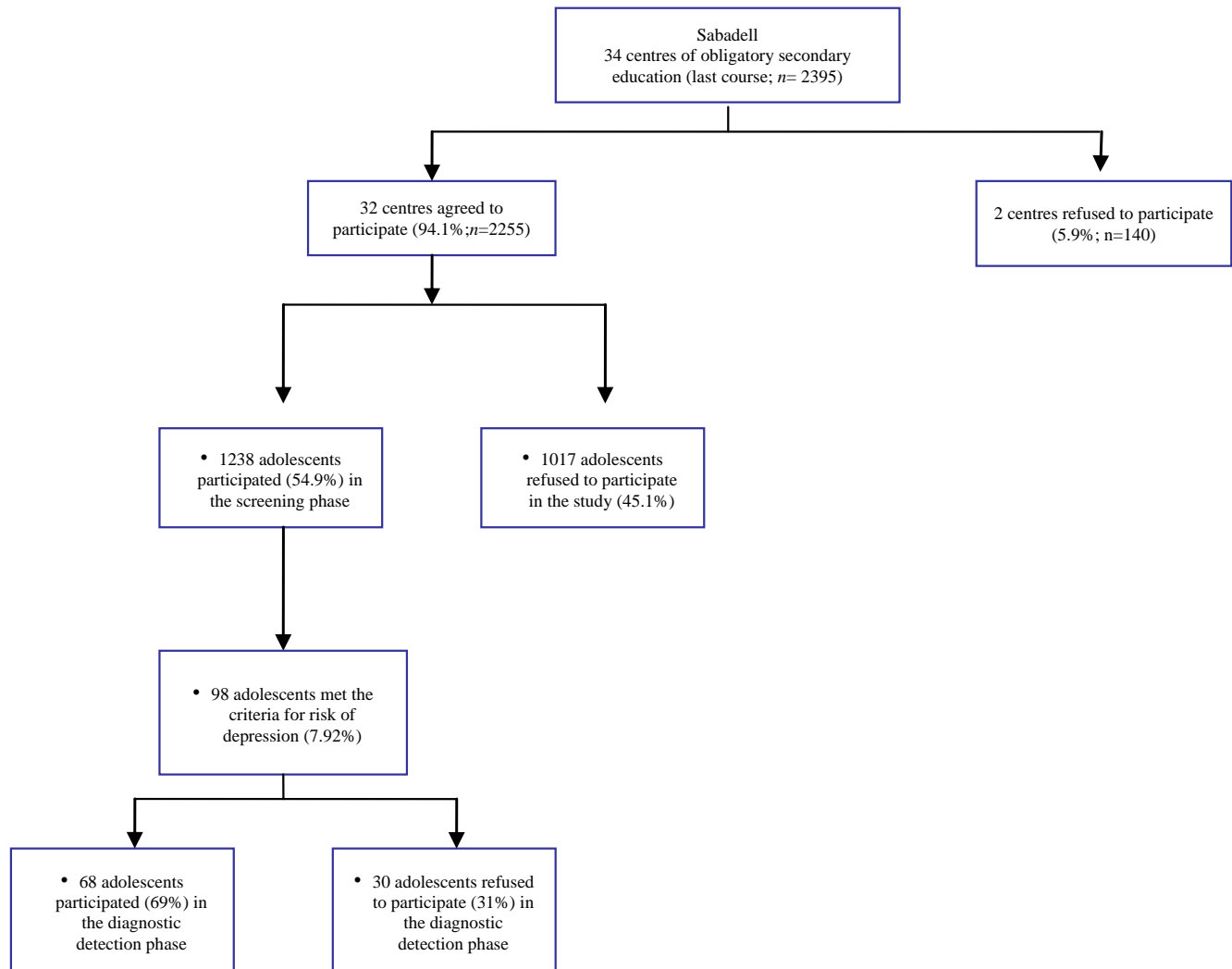
Figure 1. Flowchart of recruitment of participants.

depression and reduce suicidal behaviour (Hegerl et al., 2008). Prevention and depression early detection in adolescents are interventions included in this European program, initiated in Sabadell (Spain) in 2007, with psychoeducational interventions and screening programs in secondary schools. The main objective of our investigation was to examine the prevalence of MDD in the adolescent population of a city of 200,000 inhabitants using a psychiatric diagnostic tool. We also aimed to study the possible differences in prevalence based on internal (sex, age) and external (family history) factors and examine the comorbidity of MDD with other psychiatric disorders.

MATERIALS AND METHODS

Study design and participants

A two-phase prospective observational study: (a) Initial screening phase, to detect adolescents with significant depressive symptoms;

(b) Diagnostic phase, to determine whether the adolescents at risk detected in the first phase met the DSM-IV clinical criteria.

The research was carried out in Sabadell, a city of 207,338 inhabitants (Instituto Nacional de estadística, 2010) located in the province of Barcelona (Spain). Sabadell has 34 secondary educational institutions (63.7% of which are state schools and the rest private with public financial support). Thirty-two (94.1%) of these schools agreed to take part in our study. A total of 1,238 adolescents in their final year of compulsory secondary education (15 to 16 years old) in Sabadell (n = 2,395) agreed to participate (54.9% of adolescents enrolled). The flow chart of participants included in the study is shown in Figure 1.

Instruments

Depressive symptomatology

The Beck Depression Inventory (BDI): BDI is a 21-item self-administered screening questionnaire that includes the main symptoms of depression used as diagnostic criteria in the DSM-IV (Beck et al., 1961). It is applicable to adolescents from 13 years of age and allows reliable identification of adolescents who may suffer

Sabadell
34 centres of obligatory secondary education (last course; n= 2395)

32 centres agreed to participate (94.1%; n=2255)

2 centres refused to participate (5.9%; n=140)

- 1238 adolescents participated (54.9%) in the screening phase

- 1017 adolescents refused to participate in the study (45.1%)

- 98 adolescents met the criteria for risk of depression (7.92%)

- 68 adolescents participated (69%) in the diagnostic detection phase

- 30 adolescents refused to participate (31%) in the diagnostic detection phase

Figure 1. Flowchart of recruitment of participants.

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from depression. Sanz et al. (2003) validated this tool in a Spanish population; using 17 points as a cut-off.

Diagnosis of depression and psychiatric comorbidity

Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS): *Full interview* of K-SADS) is given in previous study (Kaufman et al., 1997). K-SADS is a semi-structured interview for children and adolescents aged 6 to 18 years, based on DSM-IV diagnostic criteria (these criteria were not modified in DSM V). It has been shown to be a valid and reliable instrument for the cross-sectional and longitudinal evaluation of psychopathology in children and adolescents, and one of the most widely used in children and youth research. The Spanish version was adapted and validated by Ulloa et al. (2006).

Complementary scales

The parents' version of the *Child Behavior Check-list* (CBCL): CBCL is a self-report instrument designed to assess adaptative behaviours and problem behaviour in children aged 4 to 18 years (Achenbach, 1978; Achenbach and Edelbrock, 1985). CBCL is composed of 113 items classified into two main categories: Internalising problems (such as anxiety, depression, somatic complaints and inhibited behaviour) and externalising problems (such as aggression and dissocial behaviour). It also addresses social, thought and attention problems. This instrument was validated by Ezpeleta et al. in a Spanish population (Ezpeleta et al., 2008).

State-Trait Anxiety Inventory for Children (STAIC) (Spielberger et al., 1973; Spielberger et al., 1982): STAIC is a self-report instrument for measuring anxiety in children and adolescents. This questionnaire was validated for the Spanish population by Seisdedos (1990). It consists of two 20-item separate scales that measure State Anxiety (S/A) and Trait Anxiety (T/A).

Procedure

The study was approved by the Clinical Research Ethics Committee (CEIC) at the Corporació Sanitària i Universitària, Parc Taulí de Sabadell (CSUPT) and the local Department of Education. A letter providing information about the study was sent to the Board of Directors at the 34 secondary education centres in Sabadell. It included detailed information about the research and the main objectives of our study and all pupils in their final year of secondary school were invited to participate in the study. Thirty-two (94.1%) of these centres agreed to collaborate in the study. Written informed consent from parents and the explicit assent of adolescents were required to participate in the study. The youths had the option of refusing to participate and 54.9% agreed to take part.

The two phases of the study were implemented as scheduled. The first phase consisted of initial *screening* to identify adolescents with significant depressive symptoms, likely to be at risk of MDD. Between December, 2007 and March, 2008, various (check) CSUPT investigators visited the collaborating schools to administer the BDI screening questionnaire. The criterion used to establish whether a participant was at risk for this pathology was a score equal or superior to 17 on this instrument. A lower cut off point than that reported in other studies (cut off 21) was established in order to increase sensitivity.

Subsequently, participants identified as being at risk were contacted by telephone to visit the Child and Adolescent Mental Health Centre in Sabadell (CSMIJ) and participate in the second

phase of the study: diagnostic detection. Between April and June, 2008, a specially trained clinical psychologist administered the K-SADS clinical interview to adolescents and their parents in order to determine whether these adolescents suffered from MDD. A blind external reviewer assessed the patients to guarantee inter-observer reliability. Clinical exploration was completed with the administration of the STAIC to the youths and CBCL to their parents. Patient's parents were asked about family story of depression, too. The information collected from these questionnaires and from K-SADS allowed us to assess the comorbidity of MDD with other psychiatric disorders.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) version 17 was used for statistical analysis. A frequency analysis was performed to study the percentage of risk and prevalence of MDD, in total and according to certain sociodemographic characteristics (e.g. sex and age), and determine the rate of comorbid psychiatric disorders associated with MDD. The chi-square test or Fisher exact test as appropriate was used to compare proportions in categorical variables (sex, age groups, family history, comorbid psychiatric disorders, etc.) and continuous variables were analysed with Pearson's bivariate correlation. For all statistical analysis performed, a level of $p < 0.05$ was considered statistically significant.

RESULTS

Study population

Of the 1,238 adolescents who took part in the study, 509 were male (41.11%) and 729 female (58.93%). The vast majority [n=1137 (91.85%)] were 15- or 16-year-olds (mean age=16.06, SD=0.630). The percentage of immigrants was 10.8% (n=134) and grade repeaters in any academic course accounted for 19.46% (n=236). Further details are shown in Table 1.

Prevalence of major depressive disorder in adolescents

The initial screening showed that 7.92% of the participants (95% Confidence Interval=6.54 to 9.56%, n=98) were at risk for depression (BDI ≥ 17). The percentage of risk was higher in girls (10.28%) than in boys (3.54%) (x^2=19.59, p=0.001, OR=3.12, 95% CI=1.8419 to 5.29) without differences by age (x^2=0.03, p=0.874). Of these 98 adolescents, 68 attended the interview in the second phase of the study.

After completion of both phases of the study, prevalence of MDD in the adolescent population of Sabadell was estimated at 1.29% [95% CI= 0.80% to 2.09% (n=16)] (Table 2).

The statistical data shown in Table 2 indicate there was a significant difference in the prevalence of MDD by sex and age, but not according to family history of depression. Thus, the prevalence of MDD was almost 5 times higher in girls (1.92%) than in boys (0.39%)

Table 1. Sociodemographic characteristics of study population

Sociodemographic characteristics	Study population (*n*=1238)	
	Count	Percentage
Sex		
Men	509	41.11
Women	729	58.89
Birth place		
Catalonia	1104	89.17
Others Spanish communities	26	2.1
Abroad	108	8.7
School type		
State	735	59.36
State subsidised	503	40.63
Age (years)		
15	690	55.74
16 or above	527	44.26
Repeater		
Non repeater	977	80.54
Repeater	236	19.46

Table 2. Risk of depression and MDD among Spanish adolescents.

Phase	n	Tools	Risk of depression	MDD	Anxiety	CBCL
1st phase: screening	1238	BDI	7.92%			
2nd phase: diagnosis	98	K-SADS STAIC/S STAIC/T CBCL		1.29%	41.94 (m) 45.69 (m)	Associated scale II (somatic complaints)

(O*R*=0.202; 95% CI= 0.046 to 0.892) and in adolescents aged 16 and older (2.74%) than in 15-year olds (0.14%) (O*R*=0.050 to 95%; CI=0.07 to 0.376).

Comorbidity with other psychopathological disorders

The K-SADS diagnostic interview showed that 50% of individuals diagnosed with MDD had other comorbid psychiatric disorders (Table 3). Significant differences were found between adolescents with MDD and those without. Adolescents with MDD presented comorbidity mainly with eating disorders, followed by anxiety disorders, ADHD and tic disorder.

Regarding the linear association between the variables measured in the questionnaires, BDI scores for depressive symptoms were positively associated with scales of trait anxiety (STAIC T/A; *r*=0.319*, *p*=0.039) and state anxiety (STAIC S/A; *r*=0.326, *p*=0.034). Thus, adolescents with high scores in depressive symptomatology presented high levels of trait and state anxiety. Depressive symptoms evaluated with the BDI positively associated with scale 2 of the CBCL (somatic complaints) (*r*=0.262, *p* =0.047) but no linear association was found between the other subscales of this instrument (Table 4).

DISCUSSION

A total of 1.29% (95% *CI*=0.80% to 2.09%) of the adolescent in our sample *presented MDD.* This prevalence is slightly lower than that observed in previous Spanish studies, such as that performed by Canals et al. (1997) who estimated the prevalence of adolescent depression at 2.4%, according to *Schedules for Clinical Assessment in Neuropsychiatry (SCAN)* (Wing et al., 1990). These discrepancies may be explained by the fact that their study was conducted on a random sample of subjects aged 17 to 18 years, whereas the students recruited for our study were younger (15 to 16 years), as well as the use of a different diagnostic

Table 3. Prevalence of major depressive disorder by sex, age and family history.

Sociodemographic characteristics of interest	Study population (*n*=1238)		Participants with major depressive disorder (*n*=16)				
	Count	Percentage	Frequency (*f*)	Percentage	Pearson's Chi-square (χ²) / Fisher Test	*p*	*OR (CI 95% for OR)*
Sex							
Men	509	41.11	2	0.39	5.466	0.019	0.202(0.046 to 0.892)
Women	729	58.89	14	1.92			
Age							
15	690	55.74	1	0.14	-	0.000	0.050 (0.007 to 0.376)
≥16 years	527	44.26	15	2.74			

Table 4. Psychiatric comorbidity of major depressive disorder in adolescents interviewed.

Psychiatric disorder	Participants with MDD (n=16)		Participants without MDD (n=52)		Pearson's Chi square (χ²)	df	*p*
	Frequency (*f*)	Percentage	Frequency (*f*)	Percentage			
Any psychiatric disorder	8	50.00	13	25.00	5.448	1	0.020

MDD: Major depressive disorder.

instrument. Despite these differences, both studies seem to indicate that the prevalence observed in Spain is far from the estimated 5.6% of young 13- to 18-year-old Americans, according to an exhaustive meta-analysis by Costello et al (2006), and the 5.8% obtained in Sweden (Olsson and Von Knorring, 1999).

Although the prevalence of depression in Spain has been found to be lower than in other countries, it should not be overlooked that 7.92% (95% IC=6.54% to 9.56%) of participants presented important depressive symptoms, though only a minority met the diagnostic criteria for MDD. These values are intermediate between the 3.4% observed by Canals et al. (1995) according to CDRS-R scores (Poznanski et al., 1984) and the 10% estimated by other studies performed in Spain (Escriba et al., 2005) and the USA (Bazargan-Hejazi et al., 2010). Factors like family structures in our country and primary care training in mental health could differences.

Detecting depression in children is a difficult task as, unlike externalising disorders, depressive symptoms are often unrecognised by others and rarely the main reason for seeking help. Nevertheless, early identification of these adolescents is fundamental as it allows early intervention and, consequently, a reduction in the chronicity of the pathology and effective prevention of suicidal behaviours. We should bear in mind that depression is the second most common risk factor for suicide in adolescents (the first is a previous suicide attempt) , and that depressed adolescents are more likely to attempt suicide than non-depressed subjects (Simeonova et al., 2015).

Having established the prevalence of MDD in our study

population, we sought to determine whether this prevalence was different according to certain internal (sex and age) and external (family history of depression) variables. With regard to differences by sex, we found 1.92% of girls and 0.34% of boys were diagnosed with MDD. These results coincide with most epidemiological studies published that observed a higher prevalence of depression in female subjects (Canals et al., 1997; Martínez et al., 2006; Poznanski et al., 1984). Indeed, certain pubertal factors (such as increases in sex steroid hormones) have been associated with the increase of depression rates among girls (Costello et al., 2006). The prevalence of MDD increases dramatically from the age of 16 years. This may be explained by the fact that adolescents gradually undergo a process of complex physical, psychological, cognitive and sociocultural changes. Adolescents are thus forced to develop strategies to cope with such important challenges and allow them to build a sense of identity, autonomy and achieve personal and social success. Failure to meet these needs may lead to various psychiatric problems (Blum, 2000). In Spain, 16 years old is the start of the working age and it could be another factor to explain this ratio. Finally, unlike the findings of Klein et al. (2001), the adolescents with MDD assessed in our study did not have a family history of depression.

The high comorbidity of MDD (50%) in our study is similar to that obtained in an English study in which 58% of depressed adolescents included in a community sample presented other psychiatric disorders (Essau, 2008). Other studies Biederman et al., 1995; Biederman et al., 1996; Czernik et al., 2006; De la Peña et al., 1999;

Essau, 2008 have also shown that adolescents with MDD presented a higher percentage of psychiatric disorders than non-depressive adolescents. Eating and anxiety disorders were the two most frequently associated disorders, in agreement with the study by Czernik et al. (2006)

To the best of our knowledge, this is one of the first epidemiological studies on depression performed in Spanish adolescents. The results obtained have allowed us to determine the prevalence and degree of depression in 15 to 16 year olds, which is slight lower than in previous studies.

In conclusion, our study found that although a high percentage of adolescents were at risk of developing depression (7.92%; 95% CI=6.54 to 9.56%), only 1.29% (95% CI=0.80 to 2.09%) of the study population met the diagnostic criteria for MDD. This disorder was more frequent in girls and in youths over 16 years of age and presented high comorbidity with other psychiatric disorders. Specific screening is recommended for students with depressive symptoms in the school environment. Thus, the training of health and education professionals is vital to improve the identification of signs and symptoms of depression in adolescents. Using screening questionnaires like the BDI can facilitate early detection of MDD in youth and allow initiation of treatment in the early stages of the disorder to reduce the recurrence, chronicity and morbidity associated with depression in adolescents, especially suicide behaviours prevention.

Limitations

Despite the strengths of our study, especially with respect to specific data on 15/16-year-olds, there are some limitations which should be outlined. The refusal rates in the screening period (45%) and in the second phase (33%) are higher than expected and the prevalence of depression may have been partially underestimated. Furthermore, we are the sole psychiatry department in our health area, so if patients with depressive symptoms are missed in this period, they would be detected by primary care or school nurses and referred to our department for treatment.

Another limitation of our study is that we did not use structured tools to identify participants' family history, which may explain why we were not able to replicate the association found in the literature. While the use of these tools is desirable and recommended for future studies, it was reluctantly decided that due to the size of the population of our catchment area and the limited psychiatric services available, administration of these instruments would not have been practical within the study time frame.

Further studies are required to corroborate these results and determine with greater accuracy where resources can best be employed to improve the effectiveness and focus of interventions designed for adolescents at risk of MDD.

Conflicts of Interests

The authors declared no conflict of interest related to this.

Abbreviations: MDD, Major depressive disorder; **K-SADS,** Kiddie Schedule for Affective Disorders and Schizophrenia for School-Age Children; **BDI,** Beck Depression Inventory; **EAAD,** European Alliance Against Depression; **SPSS,** Statistical Package for the Social Sciences; **CBCL,** Child Behavior Check-list; **STAIC,** State-Trait Anxiety Inventory for Children; **CEIC,** Comité Ético de Investigación Clínica; **CSUPT,** Corporació Sanitària i Universitària del Parc Taulí.

REFERENCES

Achenbach TM (1978). The Child Behavior Profile, I: Boys aged 6-11. J. Consult Clin Psychol. 46:478-488..

Achenbach TM, Edelbrock CS (1985). Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington. TV. University Associates in Psychiatry.

Alaéz M, Martínez-Arias R, Rodríguez-Sutil C (2000). Prevalencia de trastornos psicológicos en niños y adolescentes, su relación con la edad y el género. Psicothema 12:525-532..

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th edn. American Psychiatric Association, Washington, DC..

Bazargan-Hejazi S, Alvarez G, Teklehaimanot S, Nikakhtar N, Bazargan M (2010). Prevalence of depression symptoms among adolescents aged 12-17 years in California and the role of overweight as a risk factor. Ethn Dis. 20:107-15..

Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J (1961). An inventory for measuring depression. Arch Gen Psychiatry. 4:561-571.

Biederman J, Faraone S, Mick E, Lelon E (1995). Psychiatric comorbidity among referred juveniles with major depression: Fact or artifact? J. Am. Acad. Child Adolesc. Psychiatry 34:579-590..

Biederman J, Faraone S, Mick E, Moore P, Lelon E (1996). Child Behavior Checklist findings further support comorbidity between ADHD and major depression in a referred sample. J. Am. Acad. Child Adolesc. Psychiatry 35:734-742.

Blackman GL, Ostrander R, Herman KC (2005). Children with ADHD and depression: A multisource, multimethod assessment of clinical, social, and academic functioning. J. Atten Disord. 8:195-207.

Blum R (2000). Un modelo conceptual de salud del adolescente. En E.

Dulanto (Ed.), El adolescente México. Mc Graw Hill. pp. 656-672.

Canals J, Domenech E, Carbajo G, Bladé J (1997). Prevalence of DSM-IIIR and ICD-10 psychiatric disorders in a Spanish population of 18-years olds. Acta Psychiatry Scand. 96:287-294.

Canals J, Martí-Heneberg C, Fernández J, Domènech E (1995). A longitudinal study of depression in an urban Spanish pubertal population. Eur. Child Adolesc. Psychiatry 4:102-111.

Costello JE, Erkanli A, Angold A (2006). Is there an epidemic of child or adolescent depression? J. Child Psychol. Psychiatry 47(12):1263-1271.

Cova F (2005) Una perspectiva evolutiva de las diferencias de género en los trastornos depresivos. Ter Psycol. 23:49-58.

Czernik GE, Dabski MF, Canteros JD, Almirón LM (2006). Ansiedad, depresión y comorbilidad en adolescentes de la ciudad de corrientes. Revista de Posgrado de la VIª Cátedra de Medicina 162:1-4.

De la Peña F, Ulloa RE, Páez F (1999). Comorbilidad del trastorno depresivo mayor en los adolescentes. Prevalencia, severidad del padecimiento y funcionamiento psicosocial. Salud Ment 22:88-92.

Escriba R, Maestre C, Amores P, Pastor A, Miralles E, Escobar F (2005). Prevalencia de depresión en adolescentes. Actas Esp. Psiquiatr. 33:298-302.

Essau CA (2008). Comorbidity of depressive disorders among adolescents in community and clinical settings. Psych. Res. 158:35-42.

Ezpeleta L, Guillamón N, Granero R, de la Osa N, María Domènech J, Moya I (2007). Prevalence of mental disorders in children and adolescents from a Spanish slum. Soc. Sci. Med. 64:842-849.

Ezpeleta L,Granero R, de la Osa N, Domènech JM (2008). Unitat d' epidemiologia i de Diagnòstic de Psicopatologia del desenvolupament-UAB- y Servicio de Psicología Aplicada -UNED (2010). Baremos para CBCL 6-182001. Población española.

Fergusson DM, Woodward LJ (2002). Mental health, educational, and social role outcomes of adolescents with depression. Arch. Gen. Psychiatry 59:225-231.

Hegerl U, Wittmann M, Arensman E et al (2008). The "European Alliance Against Depression (EAAD)": a multifaceted, communitybased action programme against depression and suicidality. World J. Biol. Psychiatry 9:51-8.

Instituto Nacional de Estadística [sitio web]. Defunciones según la causa. Año 2008. Madrid: INE. [Consulta 20 enero 2010]. Disponible en: http://www.ine.es/

Instituto Nacional de estadística [sitio web]. Población de Sabadell. Censo 2010. Madrid: INE. [Consulta 20 enero 2010]. Disponible en: http://www.ine.es/

Kaufman J, Birmaher B, Brent D (1997). Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. J. Am. Acad. Child Adolesc. Psychiatry 36:980-988.

Klein DN, Lewinsohn PM, Seeley JR, Rohde P (2001). A family study of major depressive disorder in a community sample of adolescents. Arch. Gen. Psychiatry 58:13-20.

Lewinsohn PM, Rohde P, Klein DN, Seeley JR (1999). Natural course of adolescent major depressive disorder: I. Continuity into young adulthood. J. Am. Acad. Child Adolesc. Psychiatry 38:56-63

Leyva R, Hernández AM, Nava G, López V (2007). Depresión en adolescentes y funcionamiento familiar. Rev. Med. Inst Mex Seguro Soc. 45:225-232.

Martínez JJ, Félix AM, Flores P (2006). Prevalencia y factores de riesgo para depresión en adolescentes de escuela preparatoria. Arch. Invest Pediátr. Méx. 9:5-8.

Modrzejewska R, Bomba J (2009). A comparative study on depression symptoms in Cracow primary school kids in years 1984 and 2001. Psychiatry Pol. 43:167-174.

Olsson GI, von Knorring Al, Adolescent (1999). Depression: prevalence in Swedish high-school students. Acta Psychiatry Scand. 99:324-31.

Organización Mundial de la Salud (1992). Trastornos mentales y del comportamiento (CIE-10). Madrid: Méditor.

Pine DS, Cohen P, Gurley D, Brook J, Ma Y (1998). The risk for early-adulthood anxiety and depressive disorders in adolescents with anxiety and depressive disorders. Arch. Gen. Psychiatry 55:56-64.

Pinto-Meza A, Fernández A, Fullana MA (2009). Impact of mental disorders and chronic physical conditions in health-related quality of life among primary care patients: results from an epidemiological study. Qual. Life Res. 18:1011-1008.

Poznanski EO, Grossman, JA, Buchbaum Y, Banegas M, Freeman L, Gibbons R (1984). Preliminary studies of the reliability and validity of the Children's Depression Rating Scale. J. Am. Acad. Child Psychiatry 23:191-197.

Sanz J, Perdigón AL, Vázquez C (2003). Adaptación española del Inventario para la Depresión de Beck-II (BDI-II): Propiedades psicométricas en población general. Clínica y Salud. 3:249-280.

Seisdedos N (1990). STAIC, Cuestionario de Autoevaluación. TEA Ediciones, Madrid.

Serrano-Blanco A, Palao DJ, Luciano JV (2010). Prevalence of mental disorders in primary care: results from the diagnosis and treatment of mental disorders in primary care study (DASMAP). Soc Psychiatry Psychiatr Epidemiol. 45:201-210.

Simeonova DI, Lee FJ, Walker EF (2015). Longitudinal Investogation of the relationship between family history of psychosis and affective disorders and Child Behavior Checklist ratings in clinical high-risk adolescents. Schizopphr. Res. 14:210-215.

Sofront K, Dalgliesh L, Kosky R (2005).Out of options: A cognitive model of adolescent suicide and risk-taking. Cambridge University Press, Cambridge, U.K.

Spielberger CD, Edwards CD, Lushene RE, Montuori J, Platzek D (1973). STAIC, State-trait Anxiety Inventory for Children. Palo Alto, California: Consulting Psychologists Press, Inc. Adaptación Española de TEA Ediciones, Madrid.

Spielberger CD, Goursch RL, Lushene RE (1982). Cuestionario de ansiedad Estado -Rasgo, STAI. TEA Ediciones, Madrid.

Ulloa RE, Ortiz S, Higuera F (2006). Estudio de fiabilidad interevaluador de la versión en español de la entrevista Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime version (K-SADS-PL). Actas Esp. Psiquiatry 34:36-40.

Wing JK, Babort T, Brugha T (1990). SCAN: Schedules for Clinical Assessment in Neuropsychiatry. Arch. Gen. Psychiatry 47:589-93.

Wittchen HU, Pfister H (1997). DIA-X-Manual: Instruments manual zur Durchführung von DIA-X-Interviews [DIA-X-manual: Manual for the administration of DIA-X-interviews]. Swets & Zeitlinger, Frankfurt.