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ORIGINAL CONTRIBUTION

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Predictors of depression at eighteen

A 7-year follow-up study in a Spanish nonclinical population

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Abstract This study prospectively examined predicting factors and depressive antecedents of depression in early adulthood and determined differences by sex. 199 adolescents aged 11–12 from the general community were followed up annually for 4 years and reassessed at 18 years of age. Sociodemographic data, depressive symptomatology, anxiety level, personality dimensions, self-esteem, academic aptitude and pubertal development were reported throughout this period and tested as possible risk variables of depression. At 18, depression was diagnosed using ICD-10 criteria. Of the cases of major depression (MDD) at eighteen, 30 % had been diagnosed as MDD between 12 and 14 years of age. Of the cases of MDD at eighteen, 80 % had had depressive symptomatology between the ages of 11 and 14. Subclinical scores in the Children's Depression Inventory (CDI) were early indicators of long-term risk. Gender differences were found in the risk pattern; depressive symptoms were more significant in girls than in boys. In boys, early anxious symptomatology was a significant predictor. This study reports cross-cultural data that support a continuity of depression from adolescence to young adulthood.

Key words depression – adolescence – longitudinal study – risk factors – pubertal status

Introduction

As Rutter pointed out in 1995, in the last two decades there has been a radical change in the understanding of depressive disorders that arise in early life. Interest in these diseases increased as evidence accumulated that depressive disorders in young people could have continuity over a wide age range. Many questions arise from a developmental perspective of the psychopathology of depression: What happens to individuals with initial depressive symptomatology? What happens to children and adolescents with an early diagnosis of a depressive disorder? Which factors from the individual, the family and the milieu interact?

Longitudinal prospective studies are required to answer these and other questions. Several follow-up studies have been conducted but only a few have followed subjects into adulthood in the community, using interview-based instruments and face-to-face interviews with an operationally defined depressive syndrome.

In general, researchers studying both clinical [21, 26] and non-clinical [16, 19, 30, 32] populations have considered child depression as a persistent pathology with similar risk conditions.

In a long-term study on psychosocial factors from early to mid-childhood for depression and drug disorders in early adulthood, Reinherz et al. [35] found that internalising variables such as anxiety and depression were specific predictors of depression. Furthermore, a past episode of depression or anxiety disorder would be a predictor of MDD [28]; and the studies conducted by

Kovacs et al. [25–27] have shown that dysthymia seems to be a disorder that begins early, has low recovery rates and predicts MDD.

Gender, age and severity have been linked with the course of depression [13, 20, 21, 30, 35, 36]. Severity of depression has been related to chronicity [13, 20]. Chronicity has also been related to early onset and early MDD onset is associated with female gender [29]. Age and gender differences have also been observed in risk factors. Although anxious and depressed behaviours at the ages of six and nine (reported by parents and teachers) were found to be predictors of subsequent depression, the self-report of anxiety and depression at nine is a depression-specific risk factor for males only [35].

It is known that from adolescence, depression is more frequent in women but the effects of gender on chronicity remain unclear. Several authors [4, 17] suggested that this greater prevalence in females begins at puberty and could be due to biological changes. Angold et al. [3] indicated that pubertal status was a better predictor of the differences in gender than age. Our previously reported data [11] showed that the prevalence of depression increased in girls between the ages of twelve and thirteen but we could not prove that pubertal biological changes were a risk factor.

At present, numerous questions are still unanswered and much research is still required if the continuity of depressive illness is to be prevented.

The present study deals with the prediction of ICD-10 (International Classification Diseases, 1992) depressive diagnoses at the age 18 from psychopathological, cognitive and somatic variables assessed throughout early adolescence in a Spanish general population. We investigated gender differences, depressive antecedents and the ages in adolescence that represent the greatest risk of developing depressive disorders at the age of eighteen.

Methods

Participants

The sample selected for this longitudinal analysis was 199 subjects (100 males and 99 females) who were monitored from the age of 11 and 12 until 18. The sample came from all the schoolchildren of 11 (girls) and 12 (boys) years of age (n = 621) born in the first 6 months of the year in Reus (Catalonia, Spain), an urban area of 96,000 inhabitants with above-average socioeconomic status. 87 children from outside the normal educational system (i. e. those with physical or mental disabilities, or persistent absentees) and whose parents did not give consent for their children to take part were excluded. Thus, 534 schoolchildren (girls, n = 233, boys, n = 311) were recruited at baseline and of these 290 were assessed when they were 18, although only 199 participated every year.

This study consisted of two phases. In the first phase, the subjects were assessed annually (in the same period each year) for four years (girls until they were 14 and boys until they were 15). In the second phase, both girls and boys were assessed at 18.

The overall dropout (lost at some part of the study) in follow-up was 62.7 % (45.5 % in the first phase and 17.2 % in the second phase). The psychopathological and sociodemographic data of the subjects who were successfully followed up differed from those of subjects who dropped out. On the basis of baseline assessments, subjects lost during follow-up had significantly higher depressive symptomatology ($p < 0.001$) than subjects who were successfully followed. But dropouts and successfully followed subjects did not have significantly different anxiety levels. 59 % of males and 37.7 % of females were lost. Women were therefore overrepresented ($p < 0.001$) compared to the initial sample. Subjects who dropped out were mainly from families in which the parents' occupations were less qualified and who were less well educated ($p < 0.01$).

Instruments

First phase

a) Children's Depression Inventory (CDI [24]), Spanish version [33]. This is a self-report measure containing 27 items scoring from 0 to 2 that has been used in multiple clinical and epidemiological studies. Linear Pearson correlation coefficients between CDI values across years are always significant and range from 0.547 to 0.689.

b) Self-esteem was assessed by the Rosenberg [36] and the Culture-Free Self-Esteem Inventory for Children (B form) (Culture-Free SEI) [6]. The Rosenberg and the Culture-Free SEI are self-reports of 10 and 30 items, respectively, which evaluate self-perception. Although Culture Free-SEI is a self-esteem multidimensional measure, we only used the total score for our models.

c) Eysenck Personality Questionnaire-Junior (EPQ-J [14]). This is a personality inventory for children and adolescents with 81 items of yes/no answers. It presents, according to Eysenck's model, three dimensions of personality: neuroticism or emotional instability (N), extraversion (E), and psychoticism or tough-mindedness (P). Several items from these dimensions produced the antisocial behaviour scale (AB).

d) State-Trait Anxiety Inventory for Children (STAIC [39]) in a Spanish experimental version. This inventory has 40 items which score from 1 to 3 according to severity and measures state anxiety (STAIC-S)(20 items) and trait anxiety (STAIC-T) (20 items). We used only STAIC-T for the statistical models.

e) Academic aptitude test (AAT [43]). The AAT assesses three aptitudinal dimensions: AAT–verbal, AAT–reasoning and AAT–arithmetic, which were considered in the analyses.

f) Tanner stages [42] was used to assess pubertal development. This assessment is based on the clinical evaluation of secondary sexual characteristics and correlates well with bone maturity and hormone levels. Five stages were described: 1 (pre-pubescent), 2, 3, 4 (progressive pubertal development) and 5 (post-pubescent). The pubertal status of each adolescent was assessed by a paediatrician.

g) The Children's Depression Rating Scale-Revised (CDRS-R [34]) is a semistructured interview that specifically evaluates the presence and severity of depression in children. The information obtained from the CDRS-R was used in an operational definition of caseness (Major Depression and Dysthymia) based on DSM-III-R criteria [11].

h) Sociodemographic data were collected from the parents at baseline.

Second phase

a) A Spanish version [46] of Schedules for Clinical Assessment in Neuropsychiatry (SCAN [45]). This is a semi-structured interview designed for collecting relevant information about the disorders listed in ICD-10 and DSM-III-R. The SCAN does not include personality disorders.

b) A Spanish version [9] of Beck Depression Inventory [7]. Its 21 items identify cognitive, behavioural, affective and somatic symptoms of depression and rate each item from 0 to 3 in terms of intensity.

c) State-Trait Anxiety Inventory [40]. Like STAIC, this comprises two separate 20-item self-report scales, each of which uses a four-point rating format to measure state- and trait anxiety. In the analyses we used only STAI-T.

d) Adolescent Life Change Event Scale (ALCES [48]) was administered to determine the number of life events and their impact on the adolescent. It has two parts. The first part grades the impact of each of 31 items or events from 1 to 5. The second part indicates which events were experienced during the last year.

e) Culture-Free Self-Esteem Inventory for Adults (Forma AD) (Culture-Free SEI) [6]. This inventory has 40 items and a similar structure to the Child Form. We used a Spanish version which has good psychometric properties [5].

Procedure

Table 1 shows when each test was used. The subjects in the first phase were located in their schools and assessed there or at the university. Full consent to participate was obtained from their parents and the teachers were informed of the study's proposals. In the second phase (at the age of 18) the subjects were visited at the high school or technical school and were assessed there. Subjects who were not located in their schools were phoned or sent a letter asking for their collaboration and assessed at the university. Subjects were single and living in the parental home.

Table 1 Schedule of instruments and procedure used in the study

Instruments	First phase Age: girls/boys (years)				Second phase Age (years)
	11/12	12/13	13/14	14/15	18
Depression					
Symptomatology					
CDI	■	■	■	■	
BDI					■
Diagnoses					
CDRS-R*	■	■	■		
SCAN					■
Anxiety					
STAIC	■	■	■	■	
STAI					■
Self-esteem					
Rosenberg		■			
Culture-Free SEI-C			■	■	
Culture-Free SEI					■
Personality					
EPQ-J	■	■	■	■	
Academic aptitude					
AAT	■	■	■		
Pubertal development					
Tanner Stage	■	■	■	■	
Life events					
ALCES					■
Sociodemographic data	■				

* CDRS-R was administered to the subjects at risk of depression (CDI score ≥ 17) and a control group (CDI < 17)

CDI Children's Depression Inventory; *BDI* Beck Depression Inventory; *CDRS-R* Children's Depression Rating Scale-Revised; *SCAN* Schedules for Clinical Assessment in Neuropsychiatry; *STAIC* State-Trait Anxiety Inventory for Children; *STAI* State Trait Anxiety Inventory; *SEI-C* Culture-Free/Self-Esteem Inventory for Children; *SEI* Culture-Free/Self-Esteem Inventory for Adults; *EPQJ* Eysenck Personality Questionnaire; *AAT* Academic Aptitude Test; *ALCES* Adolescent Life Change Event Scale

In the first phase of the study we used a two-stage longitudinal design [11]. In the first stage of this phase, the self-report tests described above were administered to the whole sample. In the second stage, all subjects at risk of depression (CDI score ≥ 17) in the first stage and a randomly selected control group (CDI score < 17) with the same number of subjects were assessed with the CDRS-R to obtain diagnoses of depressive disorders.

In the second phase at the age of 18, all the subjects were assessed by a semi-structured interview (SCAN [45]) and self-report tests. The prevalence of psychiatric disorders was calculated according to ICD-10 [47]. The

depressive disorders and their current prevalence rates were major depressive episode (3.4 %, 2.9 % for males and 3.9 % for females), dysthymia (6.5 %, 2.9 % for males and 9.8 % for females), not otherwise specified depressive disorder (0.7 %, 0 % for males and 1.3 % for females) and adjustment disorder with depressive reaction (2.7 %, 5.1 % for males and 0.6 % for females) (see [10]).

Data analysis

We used the Statistical Package for the Social Sciences (version 7.0 for Windows; SPSS, Inc., Chicago, Illinois) for exploratory and inferential analysis.

To delineate predictors of depressive disorders at 18, unmatched analyses were conducted using logistic regression to obtain odds ratios and 95 percent confidence intervals, with statistical significance assessed by the Wald statistic and a significance level of 0.05. Explanatory variables were grouped according to a conceptual framework, with sets including the above variables explained. In separate models for each set of variables and each age of participant we forced inclusion of all conceptually pertinent variables ("enter method"). To assess how well each model fitted, we compared our predictions with the results (a subject was predicted as a case of an outcome when his/her predicted probability was 0.5 or greater). We then expressed the percentages of cases and non-cases that were correctly classified by the model. When categorical variables were considered in the model we used the dummy-variable approach. We used standard diagnostic methods for adequacy of logistic regression models (residuals analysis, plots, Cook's distances etc.).

Results

Depressive antecedents of subjects diagnosed with depression at eighteen

Thirty percent of the subjects (25 % males and 33.3 % females) with an MDD episode at the age of 18 had also been diagnosed with MDD between the ages of 12 and 14. Of the females with MDD, 33.3 % had previously had a dysthymic disorder and MDD. Of subjects with MDD at eighteen, 50 % had scored 17 or more in the CDI at some time between the ages of 11 and 14, while 83.3 % of subjects with MDD had scored 13 or more in the CDI in early adolescence. Specificity was 80 % and 60.3 % for cut-off scores of 17 and 13, respectively.

A total of 10.5 % of subjects with dysthymia in early adulthood (2 females) had been diagnosed with MDD at the age of 13, while 40 % of dysthymic subjects had scored 17 or more in the CDI between the ages of 11 and 14. Of these subjects, 73.3 % had scored 13 or more during the same years. Specificity was 81.8 % and 62 %, respectively.

Predictors of depression at eighteen: models by age

We tested the models made up of the predictor variables according to the sex and the age of the children when they were assessed. In this way, a total of ten models were constructed for each depression group including the variables assessed each year. We defined three depression groups: 1) MDD, 2) MDD and dysthymia (Table 2) and 3) a group of all depressive disorders (MDD, dysthymia, depressive disorders not otherwise specified and adjustment disorders with depressive reaction) (Table 3). For each model, the variables were entered into the equation in successive steps.

In the girls, of all the possible predictors in the 11-year-old model, only the CDI significantly predicts (OR = 1.21, 95 % CI = 1.02–1.42, p = 0.01) the group of all depressive disorders (all DD) at eighteen (Table 3). None of the variables assessed at 12 significantly predicted depressive disorders. At thirteen, the high depressive symptomatology (CDI) (OR = 1.3, 95 % CI = 1.08–1.31, p = 0.01) and low antisocial behaviour (OR = 0.7, 95 % CI = 0.47–0.99, p = 0.04) were predictors of a higher risk of MDD and dysthymia (Table 2). Models with the girls' data at 14 had predictive values for groups of depression that were better than models of previous ages. CDI was a significant predictor of all DD (OR = 1.25, 95 % CI = 1.02–1.52, p = 0.04).

In the boys, anxiety (STAIC-T) at the age of 12 significantly predicted all DD (Table 3). The early pubertal stage in males at 12 years of age was related (OR = 0.37, 95 % CI = 0.11–1.17, p = 0.07) to depressive disorders, although not significantly. At the age of thirteen, fourteen and fifteen none of the variables assessed in boys was a significant predictor of depression at eighteen.

At the age of 18, the model in females predicted the diagnoses of depression between 50 % (MD and dysthymia) and 63 % (all DD). The BDI significantly predicted any group of depressive disorders. In males, high depressive symptomatology (BDI) and anxious symptomatology (STAI-T) were significant predictors of all DD.

Parents' occupations and parents' educational levels collected during the first year of the study were not significantly related to depression disorders at 18.

Predictors of depression at eighteen: models by factors

In this section, we present four models made up of the same variable assessed annually in early adolescence. Therefore, the depressive symptomatology (CDI) at the age of 14 in boys predicted MDD (OR = 1.68, 95 %

Table 2 Logistic Regression Model by age to predict major depressive disorder and dysthymia at eighteen

Predictors	Males Age (years)					Females Age (years)				
	12 OR	13 OR	14 OR	15 OR	18 OR	11 OR	12 OR	13 OR	14 OR	18 OR
CDI/BDI	0.90	1.15	0.97	1.13	1.15	1.12	1.04	1.31 (p = 0.01)	1.15	1.23 (p < 0.001)
STAIC-T/STAI-T	1.23 (p = 0.08)	0.97	1.22	0.97	1.07	0.97	0.98	1.02	1.01	1.05
EPQJ-N	1.01	1.06	0.99	1.17	NA	1.08	1.12	1.17	1.08	NA
EPQJ-E	1.19	1.19	1.31	1.82 (p = 0.07)	NA	0.87	0.93	1.11	0.85	NA
EPQJ-P	1.38	1.17	0.79	1.73	NA	1.38	0.96	1.45	1.03	NA
EPQJ-AB	0.93	0.97	1.40	0.85	NA	0.92	1.05	0.70 (p = 0.04)	1.02	NA
Self-esteem	NA	1.05	1.29	0.83	0.98	NA	0.91	1.10	0.99	0.95
Pubertal stage	0.42	1.4	1.83	1.57	NA	1.49	1.06	1.03	0.99	NA
AAT-V	0.99	0.91	1.03	NA	NA	1.11	1.03	1.02	NA	NA
AAT-R	0.91	0.80	0.92	NA	NA	0.81 (p = 0.05)	1.02	0.94	NA	NA
AAT-A	1.08	1.16	1.03	NA	NA	1.04	0.96	0.94	NA	NA
ALCES	NA	NA	NA	NA	0.84	NA	NA	NA	NA	1.78
Model χ^2 (df)	5.61 (10) NS	9.54 (11) NS	12.76 (11) NS	11.39 (8) NS	20.03 (4) p < 0.001	24.2 (10) p = 0.07	15.78 (11) NS	26.51 (11) p = 0.005	21.84 (8) p = 0.005	40.36 (4) p < 0.001
Predictive power (%)	0	20	16.7	0	33.3	20	13.3	23.1	42.8	50

OR Odds ratio (p value significant or nearly significant)
CDI Children's Depression Inventory; *BDI* Beck Depression Inventory; *STAIC-T* State-Trait Anxiety Inventory for Children-Trait; *STAI-T* State Trait Anxiety Inventory-Trait; *EPQJ-N* Eysenck Personality Questionnaire Junior-Neuroticism; *EPQJ-E* Eysenck Personality Questionnaire Junior-Extraversion; *EQJ-P* Eysenck Personality Questionnaire Junior-Psychoticism; *EPQJ-AB* Eysenck Personality Questionnaire Junior-Antisocial Behavior; *Self-esteem* assessed by Rosenberg scale and by Culture-Free/Self-Esteem Inventory; *AAT-V* Academic Aptitude Test-Verbal; *AAT-R* Academic Aptitude Test-Reasoning; *AAT-A* Academic Aptitude Test-Arithmetic; *ALCES* Adolescent Life Change Event Scale.
NA Not administered; *NS* Not significant

CI = 1.39–2.03, p = 0.01) and MDD and dysthymia (OR = 1.41, 95 % CI = 1.05–1.89, p = 0.02). Depressive symptomatology in girls at 14 predicted all DD (OR = 1.21, 95 % CI = 1.01–1.44, p = 0.03) and was an important predictor for MDD at 12 (OR = 1.30, 95 % CI = 1.03–1.55, p = 0.06).

Levels of trait anxiety (STAIC-T) assessed during the four consecutive years correctly classified 25 % of MDD and dysthymia (Model Chi-square 15.6 (4), p = 0.003) and 33.3 % of MDD (Model Chi-square 12.9 (4), p = 0.01) in males. In females, 20 % of the cases of MDD (Model Chi-square 11.0 (4), p = 0.02) and 20 % of the group of all depressive disorders (Model Chi-square 15.0 (4), p = 0.004) were correctly classified. High STAIC-T scores at the age of 14 in boys significantly predicted any diagnosis of depression [MD (OR = 1.60, 95 % CI = 1.03–2.46, p = 0.03), MDD and dysthymia (OR = 1.59, 95 % CI = 1.09–2.30, p = 0.01) and all DD (OR = 1.24, 95 % CI = 1.04–1.47, p = 0.01)]. STAIC-T scores at the age of 14 in girls significantly predicted all DD (OR = 1.13, 95 % CI = 1.00–1.27, p = 0.04).

As far as academic aptitude is concerned, reasoning (AAT-R) at the age of 11 predicted all DD in females (OR = 0.83, 95 % CI = 0.70–0.97, p = 0.03). For males, low AAT-R at the age of 13 also significantly predicted MDD and dysthymia (OR = 0.74, 95 % CI = 0.57–0.95, p = 0.03).

Scores of total self-esteem were better predictors of MDD and dysthymia in girls (Chi-square 12.89 (3), p = 0.004) than in boys (Chi square 2.42 (3), NS). Only low self-esteem at the age of 14 in girls was a risk factor of depression (OR = 0.8, 95 % CI = 0.65–0.97, p = 0.03).

Discussion

This study is a long follow-up of an adolescent community sample. Subjects were followed from early adolescence into early adulthood, and psychological and biological aspects were assessed as predictors of depression. From these variables, two models of prediction were designed. We defined the three depression groups in accordance with both clinical and methodological criteria. For instance, when we designed the

Table 3 Logistic Regression Model by age to predict all depressive disorders (MDD, dysthymia, depressive disorder not otherwise specified, adjustment disorder with depressive reaction) at eighteen

Predictors	Males Age (years)					Females Age (years)				
	12 OR	13 OR	14 OR	15 OR	18 OR	11 OR	12 OR	13 OR	14 OR	18 OR
CDI/BDI	0.94	0.99	0.91	1.28	1.25 ($p = 0.01$)	1.21 ($p = 0.01$)	1.05	1.20 ($p = 0.06$)	1.25 ($p = 0.04$)	1.32 ($p < 0.001$)
STAIC-T/STAI-T	1.19 ($p = 0.03$)	1.00	1.08	0.90	1.18 ($p = 0.05$)	0.94	0.99	1.06	1.02	1.05
EPQJ-N	1.04	1.27	1.20	1.05	NA	1.01	1.06	1.04	1.04	NA
EPQJ-E	1.20	1.03	0.93	1.22	NA	0.91	0.94	0.98	0.89	NA
EPQJ-P	1.18	0.89	0.88	1.35	NA	1.30	0.93	1.19	1.02	NA
EPQJ-AB	0.88	0.97	1.27	1.00	NA	0.95	1.09	0.86	0.99	NA
Self-esteem	NA	1.12	1.36	0.82	1.12	NA	0.90	1.10	1.12	0.95
Pubertal stage	0.37 ($p = 0.07$)	0.70	1.62	0.85	NA	1.14	0.99	0.82	0.76	NA
AAT-V	1.04	1.01	1.03	NA	NA	1.07	1.02	0.92	NA	NA
AAT-R	0.89	0.89 ($p = 0.09$)	0.89	NA	NA	0.89	1.05	1.02	NA	NA
AAT-A	NA	1.00	1.00	NA	NA	1.07	0.98	0.99	NA	NA
ALCES	NA	NA	NA	NA	0.81	NA	NA	NA	NA	0.76 ($p = 0.07$)
Model χ^2 (df)	8.56 (10) NS	9.41 (11) NS	12.45 (11) NS	13.64 (8) $p = 0.09$	31.2 (4) $p < 0.001$	23.11 (10) $p = 0.01$	14.88 (11) NS	22.72 (11) $p = 0.019$	22.59 (8) $p = 0.003$	55.4 (4) $p < 0.001$
Predictive power (%)	0 %	9.1 %	10 %	11.1 %	38.4 %	33.3 %	17.6 %	25 %	35.3 %	63.1 %

OR Odds ratio (p value significant or nearly significant)
CDI Children's Depression Inventory; *BDI* Beck Depression Inventory; *STAIC-T* State-Trait Anxiety Inventory for Children-Trait; *STAI-T* State Trait Anxiety Inventory-Trait; *EPQJ-N* Eysenck Personality Questionnaire Junior-Neuroticism; *EPQJ-E* Eysenck Personality Questionnaire Junior-Extraversion; *EQJ-P* Eysenck Personality Questionnaire Junior-Psychoticism; *EPQJ-AB* Eysenck Personality Questionnaire Junior-Antisocial Behavior; *Self-esteem* assessed by Rosenberg scale and by Culture-Free/Self-Esteem Inventory; *AAT-V* Academic Aptitude Test-Verbal; *AAT-R* Academic Aptitude Test-Reasoning; *AAT-A* Academic Aptitude Test-Arithmetic; *ALCES* Adolescent Life Change Event Scale.
NA Not administered; *NS* Not significant

third group we took into account that according to Lewinsohn et al. [30] the prognosis of adolescent adjustment disorders is nearly as poor as the prognosis of MDD. Also, as this group contained several disorders, we had a larger number of subjects for analysis.

The depressive antecedents of subjects diagnosed with depression at eighteen indicate that depressive disorder continues from adolescence into early adulthood. This is consistent with literature on clinical and non-clinical populations [21, 27, 30]. The natural course suggests that this continuity is due to remissions and recurrence of episodes. Results indicate that girls with depression are more likely to develop MDD and dysthymia in young adulthood. In general, depressive females were also better identified than depressive males from the predictor factors. Also, the depressive symptomatology was a better predictor of depression in females than in males. These data support the hypothesis of a greater risk in women, although they do not answer the problem outlined by Lewinsohn et al. [30] of how gender affects the continuity of depression. Moreover, our data do not fully coincide with those of Reinherz et al. [35] or Hofstra et al. [23] who reported that anxiety and depression were subsequent depression-specific risk factors for males only.

One of the interesting aspects of the present study was that the CDI, as an indicator of depressive symptomatology, was an early long-term risk factor when scores were of non-clinical risk (13 or above). Data about its sensibility and specificity support that scores above 13 in adolescents of the community should be detected and supervised.

On the other hand, we agree with Reinherz et al. [35] that the self-report of anxiety was a subsequent depression-specific risk factor for males. Anxiety was a better predictor in males than in females. This finding is not consistent with the review by Gasquet [18] who reported that anxiety is linked to depression in adolescent females. In our study, anxiety was an important predictor in females when it was analysed alone in the model (models by factors) without the variable of depressive symptomatology. Models by factors probably tell us the

age at which emotional symptoms best predict subsequent depression.

In this way, although depressive symptoms in girls were predictors from early adolescence, the age of higher risk to predict depression was between 13 and 14. Previous results about the prevalence of depression in early adolescence [11] showed that depression increased in girls at the age of 13. This is consistent with data from the Dunedin Longitudinal Study [31], the New York Study [12], the Great Smoky Mountains Study [3] and Wade et al. [44] in communities in which depression among females did not increase until after 13. This age may correspond to a period of change in development which is particularly significant in girls and which is related to puberty. Although for a long time pubertal stages seemed not to be a significant predictor of depression, we have observed trends that support Stattin and Magnusson's argument [41]; early maturity in 11-year-old girls and later maturity in 12-year-old boys could be related to depression at eighteen. However, according to Angold et al. [3] hormonal changes during puberty could be more important than the pubertal time.

In general our results did not support the relationship between low achievement and depression. However, low achievement in reasoning at an early age was found to be a predictor of depression in girls as it was in boys at an older age. This age difference may correspond to a period of biological similarities and in general the achievement factor seems to precede the emotional symptoms.

On the other hand, most research has demonstrated the relationship between negative life events and depression [1, 28] but our study did not show that at eighteen the number of negative life events was a risk factor for depression. In our opinion, the ALCES was not a good instrument for assessing stress in our sample of eighteen year olds. This may have been for cultural reasons or it may be more valid in a younger sample.

Our study has clinical implications although it also has limitations. The main limitation is the attrition of the sample during the follow-up. The sample loss was large and many of the drop-outs were depressive in the early years of the study. Farmer et al. [15] found that subjects with depressive symptoms were more likely to be lost to follow-up. Subjects with a low level of education and SES also had higher drop-out rates. Consistent with Hofstra et al. [22], males were more likely to drop out at a later stage than females. Thus, at the end of the follow-up, the socioeconomic and educational levels of the sample were higher than in the baseline sample and women were overrepresented. In spite of the limitations, we estimate that the attrition rate does not constitute a major source of bias in the prediction results because we monitored the whole sample, not only the subjects at risk. The data reported give cross-cultural support to the continuity of non-severe forms of depression from adolescence. Subclinical symptoms of depression in girls and of anxiety in boys should be considered in adolescents of the community to prevent depressive disorders at adulthood.

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