Suicidality in a community sample of early adolescents: a three-phase follow-up study

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Abstract

Objective: The aim of the study was to collect data on suicidal ideation and suicidal risk prevalence in a three-phase epidemiological study. **Method:** In the 1st phase 1514 participants (720 boys;mean-age=10.2) filled out the *Children's Depression Inventory* (CDI) and other psychopathological tests. 562 individuals (mean-age=11.3) were selected to participate in the 2nd phase as at-risk individuals of emotional disorders or as controls, and the CDI and the Mini-International Neuropsychiatric Interview for Children and Adolescents (M.I.N.I.-Kid) were administered. In the 3rd phase the participants (245;mean-age=13.5) filled out the *Youth's Inventory-4*. **Results:** The results of the CDI indicated that 15.9% of the participants showed suicidal ideation in the 1st phase, and 18.2% and 18.0% in the 2nd and 3rd phases, respectively. 33.0% of the participants persisted at one year of follow-up with suicidal ideation. The M.I.N.I.-Kid showed 12.2% past suicidal risk and a current risk of 2.4%. The current suicidal risk was mainly related to depressive disorders (OR 30.3). Predictors of current suicidal risk for boys included having previous depressive symptoms. For girls predictors included having previous anxiety and obsessive-compulsive symptoms, suicidal ideation and lower socioeconomic status. **Conclusions:** Spanish early adolescents had relevant rates of suicidal behaviour; thus, it is important to create and apply prevention programmes that consider the risk factors.

Key words: Suicidality; Suicidal ideation; Adolescence; Emotional symptoms; Risk factors

Introduction

Recently, the Centers for Disease Control and Prevention (CDC) stated that suicide is the second leading cause of death among adolescents and young adults, and constitutes a relevant public health problem around the world [CDC, 2017; World Health Organization (WHO), 2012]. Given that the chronological progression to adolescence involves significant cognitive, emotional, and behavioural changes, it is considered a period of increased vulnerability that may elevate the risk of suicidal behaviour (Hawton et al., 2012; Taliaferro et al., 2014).

Worldwide, the highest prevalence of adolescent suicide has been found in Southeast Asia, Eastern Europe and the United States (US) [CDC, 2014; United Nations Children's Fund (UNICEF), 2011, 2012; Värnik, 2012]. The last report from the National Statistical Institute of Spain (INE), dating from 2015, stated that 16.7% of deaths among young people aged between 15 and 29 years old were due to suicide; however, there is a discrepancy in the data because the Institutes of Legal Medicine (ILM) report a higher yearly rate of suicides than the INE (Giner and Guija, 2014). Specifically, the INE register and the ILM register showed different data for almost every province in each year from 2006 to 2010 (the difference in the figures recorded by each Institute ranged from 233 to 445 suicides recorded); only for La Rioja do the data of both registers coincide in each year studied.

Research into suicide has always been accompanied by a lack of definitional clarity. Considering conceptualization, it should be noted that the broad term of suicidality includes suicidal ideation, suicidal plans, suicidal threats, self-injurious behaviour, suicide attempts, and completion of suicide, all of which are considered inside a suicidal behaviour spectrum (Meyer et al., 2010). Within the Interpersonal Theory of Suicide, Joiner (2005) introduced a framework by which suicidal ideation and the progression from ideation to attempts were treated as separate processes because most people who have suicidal thoughts never go on to

make an attempt. Thus, ideation and attempts need to be handled differently (Klonsky and May, 2014; Nock et al., 2008). Based on Joiner's proposal and considering the "ideation-to-action" framework, Klonsky and May (2015) proposed a new theory of suicide called the Three-Step Theory (3ST). This theory considers that suicide ideation results from a combination of pain and hopelessness, and that connectedness is a protective factor, and the progression from ideation to attempt is facilitated by factors that make a suicide attempt possible.

Regarding prevalence, using retrospective self-reports Nock et al. (2013) found that the lifetime rates of suicidal ideation, suicide plans, and attempts among United States (US) adolescents were 12.1%, 4.0% and 4.1% respectively; 33.4% of the ideators went on to develop a suicide plan, and 33.9% made an attempt. On the other hand, Burke et al. (2016) conducted a longitudinal study and at baseline found that 10.8% of the early US adolescents showed suicidal ideation. In children and adolescent samples from several European countries the suicidal ideation rates ranged between 5.5% and 32.3% (Carli et al., 2014; Coughlan et al., 2014; Fonseca-Pedrero et al., 2018; Kovess-Masfety et al., 2015). Specifically in Spain, previous research conducted with adolescent samples showed rates of suicidal ideation and attempts that ranged between 7.0% and 12.5% and between 2.0% and 4.0%, respectively (Bousoño et al., 2017; Fonseca-Pedrero et al., 2018; Kirchner et al., 2011). In South Korea, Kang et al. (2015) conducted a study using a web-based anonymous self-reported survey and found a suicidal ideation rate of 19.1% in adolescents aged 12-18 years. Considering these suicidality rates, it is also necessary to carry out research on the ways in which suicidal behaviour appears. Previous studies have reported that several forms of maltreatment or exposure to physical or sexual abuse during childhood and adolescence are strongly related to the presence of suicidal behaviour (Barzilay et al., 2017; Gomez et al., 2017; Miller et al., 2017; Moore et al., 2017). In addition, some psychological processes such

as a sense of worthlessness, low self-esteem or impulsivity, beyond the effect of the presence of a depressive episode, have an impact on suicidality at different stages (Cha et al., 2018; Jang et al., 2014; Jeon et al., 2014; Klonsky and May, 2014). In a recent cross-sectional study, Bousoño et al. (2017) found that previous attempts, depressive symptoms, pathological use of the internet, alcohol consumption or having problems with peers are predictors for suicidal ideation among Spanish adolescents. Many adolescents with suicidal behaviour also meet criteria for at least one mental disorder, such as disruptive behaviour, characterized more by impulse control, or by depression or anxiety disorders, related more to mood (Bentley et al., 2016; Nock et al., 2010; Nock et al., 2013). Likewise, several studies explored factors that protect against suicidality, for instance parent connectedness, school engagement and safety, good self-esteem, and social support (Brausch and Decker, 2014; Conner et al., 2016; Logan et al., 2011; Young et al., 2011). All these factors seem to play different roles in the occurrence of suicidal behaviours in relation to characteristics such as gender, gender identity, sexual orientation, race or place of origin, or age (CDC, 2017; Haas et al., 2010; Kokkevi et al., 2012; Kõlves and De Leo, 2016; Mullany et al., 2009; Park et al., 2014).

The main purpose of the present study was to report cross-sectional and longitudinal data on suicidal behaviour in Spanish early adolescents, particularly given the lack in the scientific literature of longitudinal studies that establish relationships between several antecedent variables and suicidality. Thus, we analysed the answers from self-reports and/or from structured interviews to determine the prevalence of suicidal ideation and suicidal risk respectively. We also considered the psychopathological disorders related to the presence of current suicidal risk, the persistence of suicidal ideation, and the predictor factors for the presence of suicidal behaviour. We expected to find that the suicidal risk prevalence among Spanish early adolescents would be similar to the rates found in other countries. Moreover,

the results would reveal similar risk factors to those found in previous studies in relation to suicidality, such as previous psychopathology.

Method

Study design and participants

The project involved a three-phase epidemiological study of emotional disorders. Firstly, the research team obtained the pertinent permission from the Department of Education of the Catalan Government and the project was approved by the Hospital Universitari de Sant Joan de Reus ethics committee for research on individuals (reference number of the 1st and the 2nd phases: 07-11-29/11aclproj1 and reference number of the 3rd phase: 10-09-30/9proj2). To select a representative sample, cluster sampling was conducted by randomly selecting 6 state-subsidized private schools and 7 state schools from a total of 26 schools from all five representative areas of Reus (Spanish town of 100,000 inhabitants). Thus, 2,023 children from the 4th (9-10 years), 5th (10-11 years) and 6th (11-12 years) primary grades were asked to participate. In the 1st phase 1,514 individuals signed and returned the informed consent form (720 boys and 794 girls; *mean age* = 10.2; *SD* = 1.2). 18.0% of the participants were from families with high socioeconomic status, 42.5% were from families with middle socioeconomic status, and 39.5% of the participants were from families with low socioeconomic status; 87.5% of the children were born in Spain and 85.9% belonged to a nuclear family. The *Children's Depression Inventory* (CDI), the *Screen for Children's Anxiety Related Emotional Disorders* (SCARED), and the *Leyton Obsessional Inventory-Child Version* (LOI-CV) were administered, as well as questionnaires to obtain sociodemographic, anthropometric, and body satisfaction data. The children at risk of emotional disorders (*n* = 405) and a subsample of not-at-risk controls (*n* = 157; paired by gender, age, and school type) were assessed one year later in the 2nd phase (254 boys and 308 girls; mean age = 11.3).

There were no significant differences between the subsample at risk of emotional disorders and the subsample of not-at-risk controls for gender (χ^2 = 0.076, p = .782), birthplace χ^2 = .075, p = .784), socioeconomic status (SES) (χ^2 = 4.837, p = .089), or age (t = .852, p = .536). In this phase, the CDI, the SCARED and the LOI-CV were re-administered and psychopathological diagnoses were made using the *Mini-International Neuropsychiatric Interview for Kids* (M.I.N.I.-Kid) by a child psychiatrist and two child psychologists (the researchers' scores reached an agreement of 95%). In the 2nd phase, 121 participants (21.6%) informed that they had had to seek professional help for psychological problems. The prevalence of emotional disorders found was 3.4% for depressive disorders (Canals et al., 2018a), 11.8% for anxiety disorders (Canals et al., In press), and 1.8% for obsessive-compulsive disorder (Canals et al., 2012). After the M.I.N.I.-Kid had been applied, the researchers scored the participants using the *Children's Global Assessment* (CGAS) scale. Two years later, all the 2nd phase participants were again invited to participate in the 3rd phase of the study and n = 245 returned the signed informed consent form (98 boys and 174 girls; *mean age* = 13.5; *SD* = .9). In the 3rd phase there were no sociodemographic or emotional differences between the participants that continued in the study and participants who dropped out. Nevertheless, low SES participants had higher dropout rates than those with medium-high SES (χ^2 = 13.557; p = .001).

The participants completed the questionnaires in small groups (three or four individuals per group) and the researchers were present to instruct the children on how to answer the surveys, and also to check that no items were left blank.

Suicidal behaviour assessment

The CDI, YI-4, and M.I.N.I.-Kid were used to assess suicidal behaviour. The CDI is a self-report inventory for assessing depression symptoms and consists of 27 items with three graded choices in order of increasing severity from 0 to 2. The CDI was administered in the

1st and 2nd phases of the study. Suicidal ideation was defined when the children scored 1 or 2 on item 9 of the CDI. The YI-4 was administered in the 3rd phase, and is also a self-report scale with 120 items that correspond to the symptoms of 18 categories of DSM-IV disorders. For the present study, we only considered item 86, which asks about death and suicide thoughts, and the answers "sometimes", "often", or "very often" were considered to indicate the presence of suicidal ideation. The structured diagnostic interview M.I.N.I.-Kid was used to collect information about suicide risk directly from the child. The child was considered to have past suicidal risk when they answered "yes" to the following three questions: *"Have you ever felt so bad that you wished that you were dead?", "Have you ever tried to hurt yourself?", "Have you ever tried to take your own life?"* If a participant presented past suicidal risk, the interviewer then asked the next five questions about the last month to assess the current suicidal risk: *"Did you wish you were dead?"*, *"Did you want to hurt yourself?"*, *"Did you think about taking your own life?"*, *"Did you think about how to take your own life?"*, *"Did you try to take your own life?"*. The severity level was classified as follows: low (1-5), moderate (6-9) or high (≥10).

Suicidal ideation was considered persistent over one year when there was suicidal ideation in CDI item 9 in the 1st and 2nd phases. Suicidal ideation was considered persistent over three years when the participant showed suicidal risk in the 1st and 2nd phases and also in the 3rd phase (item 86 of the YI-4).

Psychopathological assessment instruments

The Mini-International Neuropsychiatric Interview for Kids (M.I.N.I.-Kid; Sheehan et al., 1998; Sheehan et al., 2010) is a structured diagnostic interview for children aged between 6 and 17 years old, based on DSM-IV and ICD-10 criteria. All questions have a binary response format (yes/no). For the present study we used the following diagnoses: any anxiety

disorder, conduct disorder, oppositional disorder, attention deficit hyperactivity disorder, major depression, dysthymia, and OCD. The reliability and validity of the M.I.N.I.-Kid has been demonstrated (Sheehan et al., 2010). The suicidal risk information agreement (Kappa index) between the M.I.N.I.-Kid questions and item 9 of the 2nd phase CDI was .36 (p < .001).

The Children's Depression Inventory (CDI, Kovacs, 1992) showed good reliability (α = 0.81–0.85) in the Spanish community and clinical population for assessing depression symptoms experienced over the previous two weeks by children from 7 to 15 (Figueras, Amador-Campos, Gómez-Benito, and Del Barrio, 2010). A score of 17 was considered the cut-off score for detecting depression symptoms (Canals et al., 1995). The reliability of the CDI was α = .83 in the 1st phase and α = .81 in the 2nd phase.

The Screen for Children's Anxiety Related Emotional Disorders (SCARED, Birmaher et al., 1997) is a useful, valid, and reliable 41-item self-report for predicting and screening anxiety symptoms (Canals et al., 2012a; Vigil-Colet et al., 2009). The total cut-off point for detecting anxiety symptoms was 25 (Canals et al., 2012a). The reliability of the SCARED was α = .86 in the 1st phase and α = .87 in the 2nd phase.

The Leyton Obsessional Inventory-Child Version (LOI-CV Survey Form; Berg et al., 1988; Canals et al., 2012b) has been proven to be a valid 20-item self-report questionnaire for assessing OCD symptoms in children and adolescents (Canals et al., 2012b). A score of 25 was considered the cut-off point for OCD risk. The reliability of the LOI-CV was α = .78 in the 1st phase and α = .81 in the 2nd phase.

Youth's Inventory-4 (YI-4; Gadow and Sprafkin, 1999) is a 120-item self-report rating scale that evaluates symptoms of emotional and behaviour disorders in young people aged between 2 and 18. The items correspond to the symptoms of the 18 DSM-IV categories. The YI-4 was administered in the 3rd phase and its reliability was α = .78.

Assessment of other covariates

The Children's Global Assessment Scale (CGAS, Ezpeleta et al., 1999; Shaffer et al., 1983) is answered by the interviewers after they have applied the M.I.N.I.-Kid to assess the participants' global functional impairment. The score ranges from 1 (maximum impairment) to 100 (normal functioning). Scores between 61 and 70 indicate difficulties in at least one area of the subject's life, and scores above 70 mean normal adaptation.

The sociodemographic data were collected with a questionnaire designed for the study. In the 1st phase we collected information about gender, age, place and date of birth, family structure, and parents' occupations. Socioeconomic status (SES) was estimated using the Hollingshead index (Hollingshead, 2011). In the 1st phase the participants were asked about school problems (academic achievement problems, bullying or problems with peers), and about whether a relative, friend and/or acquaintance had died in the last year. Moreover, in the 2nd phase the participants were asked if they had consulted a specialist for psychological problems.

The Body Areas Satisfaction Scale (BASS; Cash and Szymanski, 1995) assesses an individual's degree of satisfaction or dissatisfaction (scores from 1 to 5) with 10 body areas. The scale was administered in the 1st phase.

Anthropometric parameters: Weight was measured using the Tanita_TBF-300 scale with an accuracy of 100g and maximum weight of 200kg, and height was measured using an inextensible tape measure with an acceptable variation of 1mm. The body mass index (BMI) (kg/m^2) was calculated from these measurements. These parameters were assessed in the 1st phase.

Statistical analysis

SPSS software (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp) and Epidat software version 4.2 (Xunta de Galicia, Spain) were used for the analyses.

Firstly, the data were tested for normality using the Kolmogorov–Smirnov and Shapiro–Wilk tests, and as no significance was found, the sample distribution was assumed to be normal.

Current and past suicidal risk prevalence was determined by gender. The analyses using the M.I.N.I.-Kid data were weighted taking into account the false positives and negatives in M.I.N.I.-KID found in the risk and control sample, using responses 1 and 2 for CDI item 9. To ascertain the possible differences in prevalence rates between genders we used the Chi-square analyses in SPSS or the two-proportion z-test in the Epidat software.

Logistic regression models were performed to examine the risk of association between several psychopathological diagnoses and the current suicidal risk. We carried out non-adjusted models, with only the psychopathological diagnoses as a predictor, as well as models adjusted by gender, age, and the presence of any depressive disorders (major depression and/or dysthymia).

To observe the previous risk factors for the presence of current suicidal risk and suicidal ideation, logistic regression models for each gender were conducted by introducing the following covariates into the models: age, the 1st phase total scores of the CDI, SCARED, and LOI-CV, suicidal ideation of the 1st phase, the body mass index (BMI) and body satisfaction, presence of school problems or the death of a close person, SES, family type, and birthplace. No collinearity was found between the variables selected for use in the regression models.

In all the statistical analyses the levels of statistical significance were *p* values of <.05, or <.01, or <.001.

Results

Prevalence of suicidal behaviour. Severity level of the suicidal ideation

As can be seen in Table 1, in the 1st phase, 15.9% (14.2-17.9) of the participants showed suicidal ideation considering their responses to item 9 of the CDI. Boys showed higher rates of ideation than girls (boys: 18.2%; girls: 13.9%; $p = .025$). In the 2nd phase the rates increased for both genders, but there were no significant gender differences (boys: 19.5%; girls: 17.5%; $p = .637$). In the 3rd phase the results (18.0%; 13.7-23.7) were similar to those of the 2nd phase, but 3.3% of the participants answered "often" or "very often" in the YI-4 item. According to the rates determined in the M.I.N.I-Kid interview, the past suicidal risk prevalence was 12.2% (10.5-13.9) and the current risk was 2.4% (1.6-3.1). Of these individuals, 3.3% ($n = 1$) stated that they had tried to take their own life, and 16.7% ($n = 5$) had tried to hurt themselves. Moreover, 61.2% of the participants who showed suicidal ideation in the 2nd phase CDI, had past suicidal risk, while 27.6% had current suicidal risk.

PLEASE INSERT TABLE 1

Regarding the severity level for the current suicidal risk, 36.7% showed a low severity level, 23.3% a moderate risk, and 40.0% a high risk. When gender is considered, boys showed 30.8% low severity level, 7.7% moderate level, and 61.5% high level, while girls showed 41.2% low severity level, 35.3% moderate and 23.5% high. The results of the CGAS showed that the participants with past suicidal risk [Mean = 70.5, (SD = 14.6); Mode = 65.5] and with current suicidal risk [Mean = 62.8, (SD = 15.1); Mode = 45.5] had significantly lower CGAS scores than participants without past risk [Mean = 84.2, (SD = 12.5)] and without current risk [Mean = 82.6, (SD = 13.2)] respectively ($p < .001$; Cohen's $d = 1.0$, Effect size $r = 0.5$ for

past suicidal risk and without past suicidal risk, and Cohen's d = 1.4, Effect size r = 0.6 for current suicidal risk and without current suicidal risk).

Association between psychopathologic disorders and current suicidal risk

Participants with current suicidal risk had the highest association rates with any depressive disorders (56.7%), and with any anxiety disorders (53.3%) (see Table 2). Like the risk of association between psychopathological disorders and current suicidal risk, the logistic regression models showed that the participants with depressive disorders had a 30.3-fold increased risk of having current suicidal risk. Moreover, having OCD implied a 15.7-fold increased probability of current suicide risk. However, when the logistic regression models were adjusted by gender, age and the presence of any depressive disorders, only OCD (OR: 7.5) and depressive disorders (OR: 30.3) significantly explained the current suicide risk.

PLEASE INSERT TABLE 2

Follow-up: persistence and predictor factors of suicidal risk

The suicidal ideation persistence rate over one year was 33.6% (26.2-41.8), boys showed higher rates than girls but there were no statistical differences [boys: 36.9% (26.2-49.1); girls: 30.6% (21.1-42.0); p = .544). The persistence rate over three years was 9.3% (4.0-19.9), girls showed higher rates than boys but no significant differences were found [boys: 4.8% (.9-22.7); girls: 12.1% (4.8-27.3); p = .669).

As shown in Table 3, considering the predictive factors of the 1st phase, the logistic regression models showed that for boys, the higher CDI scores (OR: 1.2) explained almost 30% of the current suicidal risk (p = .004). However, for girls the results showed that higher SCARED (OR: 1.2) and LOI-CV (OR: 1.1) scores, lower SES (OR: .4), and having previous suicidal ideation (OR: 7.4) significantly explained 59.5% of the current suicidal risk. The logistic regression models for predicting suicidal ideation showed that for boys a high CDI

score (OR: 1.1) and previous suicidal ideation (OR: 3.1) were risk factors, while for girls the risk factors were body dissatisfaction (OR: .9) and being foreign (OR: .3).

PLEASE INSERT TABLE 3

Discussion

This study is mainly aimed at obtaining data on suicidal ideation and suicidal risk prevalence in early adolescents from self-reports or structured interviews respectively, as well as determining the severity of these manifestations. In addition, our objective was to determine psychopathological disorders which are associated with the presence of suicidal risk, the persistence rates of suicidal ideation throughout the study phases, and the risk factors.

In the present sample, given the responses on self-reports, 15.9% of the participants reported suicidal ideation, this rate increased to 18.2% and to 18.0% in the 2nd and 3rd phases respectively. This slight increase may be due to, among other things, the fact that from the 1st to the 2nd phase the sample was screened for emotional problems, thus the 2nd phase sample was composed of participants with a higher risk of presenting emotional disorders in comparison to the 1st phase sample. Another reason could be the participants' increase in age as other studies have found that older adolescents are more likely to show suicidal behaviour than children or younger adolescents (Carli et al., 2014; Kõlves et al., 2016). The comparison with study results obtained more than 20 years ago in the same environment with individuals of the same age group, showed that there has been no secular increase in the suicidal ideation rates (Domènech et al., 1992). Considering the interview information, 12.2% of the sample showed past suicidal risk, and 2.4% current suicidal risk prevalence; 40% of the participants with current risk had high severity levels. In line with these results, participants with suicidal risk showed significant levels of functional impairment in their lives (CGAS), indicating that suicidal behaviour can be highly disabling. Overall, our findings were similar to those found

previously by Kovess-Masfety et al. (2015) in other European children and adolescent samples (17% suicidal ideation), and slightly higher than those found in a study conducted with Spanish children and adolescents by Kirchner et al. (2011) (12.5% suicidal ideation). However, the results were quite a bit higher than the rates found by Coughlan et al. (2014) in Irish early adolescents (5.5% suicidal ideation) and lower than the rates found by Carli et al. (2014), who studied a large sample of adolescents from 11 European countries (32.3% suicidal ideation). We agree with Fonseca-Pedrero (2018) about the interpretation of the variation in the rates. That is, the various studies used different methodologies to assess suicidal behaviours, the participants had different age ranges, and we also have to consider the cultural and geographical differences. Importantly, the M.I.N.I.-Kid questions not only assess suicidal ideation, but also other aspects related to the suicidal behavioural spectrum, such as self-injury or suicide attempts. When data on non-suicidal self-injury (NSSI) are take into account, Swannell et al. (2014), in their systematic review, found a pooled prevalence of 17.2% among adolescents, which is similar to the prevalence observed in our study (16.7% had tried to hurt themselves). In relation to the suicide attempts, in the present sample only one participant answered that they had tried to take their life in the M.I.N.I.-Kid question (3.3%). Similarly, Nock et al. (2013) and Carli et al. (2014) found prevalence rates of around 4.0%. In spite of the lower rates, it is important to consider the suicide attempts, because attempts are one of the fixed risk factors for suicide completion (Bostwick et al., 2016; Shain, 2016).

Focusing on the relationship between the current suicidal risk and several psychopathological diagnoses, the findings showed a close relationship between depressive (56.7%) and anxiety (53.3%) disorders and current suicidal risk. In addition, the regression analyses showed that participants with depression and OCD showed a higher risk of having current suicidal risk. It is well established that most of the individuals with suicidal behaviours have a psychiatric

disorder, and as our results indicate, it was often a mood disorder (Bentley et al., 2016; Nock et al., 2013). It is widely known that depression is a significant risk factor for suicide (Bousoño et al., 2017; Hawton et al., 2013). In this sense, several psychological processes underlying depression, such as feelings of worthlessness or low self-esteem, as well as cognitive vulnerabilities such as a negative inferential style, can lead to the emergence of suicidal behaviours (Bousoño et al., 2017; Burke et al., 2016; Hawton et al., 2013; Turecki, 2014). This, according to Turecki (2014), may be because the negative mood and cognitive distortions could alter problem-solving capacities, thus precipitating suicidal behaviours.

The follow-up analysis indicated that suicidal ideation was moderately persistent during the study phases, especially from the 1st to the 2nd phase. Although these results did not show significant differences between genders, the ideation rates were significantly higher in boys than in girls in the 1st phase. However, this proportion reversed with age, as girls showed higher rates than boys. Nevertheless, considering the M.I.N.I.-Kid severity results, the boys showed higher proportions of severity than girls. In this regard it is known that suicidal behaviours show a differential pattern according to gender; in fact, there is the gender paradox: females are more likely to experience ideation and makes more attempts, but males are three- to fourfold more likely to die by suicide (Alvaro-Meca et al., 2013; Beautrais, 2002; McLoughlin et al., 2015). Hence, we made regression models to examine risk factors by gender. The data reported different patterns by gender, and the predictors of current suicide risk (more severity) were also different from the ideation risks (less severity). Overall, the results suggest that current suicidal risk is significantly predicted by previous psychopathological symptoms: boys showed a previous profile of depression symptoms while girls showed a previous profile of anxiety, obsessive, and suicidal ideation symptoms in addition to low SES. Nevertheless, for boys suicidal ideation was predicted by previous depression and suicidal ideation, and for girls by a disordered body perception and by being

foreign. Similarly to previous studies, all of these results suggest that it is very important to detect suicidal ideation and the presence of emotional symptoms early. Moreover, it is important to pay particular attention to the feelings of risk groups (such as adolescents that have arrived recently from other countries or those from low SES families, and adolescents with body dissatisfaction) that can later become emotional psychopathologies (Bousoño et al, 2017; Du Roscoät et al., 2016; Seo and Lee, 2013; Turecki, 2014). In this sense, the acculturation and adaptation processes of immigrant adolescents and having family economic problems, added to the fact that adolescence is a vulnerability period, are relevant stressors that can lead to the presence of psychological problems and the emergence of suicidal behaviours. Our results highlight that it is important for families, clinicians, and educators to pay attention to these warning signs and apply treatment as soon as possible, especially considering that early adolescents are probably less likely to seek help than adults. However, although it is widely known that depression, anxiety, and OCD are strongly related to suicidality, more studies about the mechanisms of suicidality in relation to these are needed (Angelakis et al., 2015; Balázs et al., 2013; Bousoño et al., 2017; Fernández de la Cruz et al., 2017; Thibodeau et al., 2013).

The present study has some limitations, such as the low sample size in the follow-up phase despite the researchers' efforts to obtain informed consent from the families, no diagnostic interview in the 3rd phase of follow-up, and that the CGAS was determined mainly from the participants' information. However, one of the most relevant limitations is that suicidal ideation was analysed using a single CDI and YI-4 item. Despite these limitations, this is a longitudinal study conducted in a community sample of adolescents using information from self-reports, structured interviews and the participants' parents. Furthermore, it assesses and includes multiple important covariates in its analyses.

Despite the global improvement in health, the global rates of suicidal behaviour are still high and suicides occur in all the world regions and at all ages. Suicidality is considered a major public health concern that can lead to serious disabilities in the daily lives of individuals who suffer from it. Completed suicide is fortunately less common during childhood and adolescence than in adulthood, but adolescence is considered a risk period. Despite all of this, there is a lack of epidemiological studies about prevalence rates, risk and protective factors, as well as other variables that would allow us to better understand this complex and multi-determined phenomenon. Likewise, it is also necessary to carry out effective prevention activities, and to avoid the situation of a lot of adolescents struggling with suicidal thoughts and behaviours.

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Table 1 Prevalence of suicidal behaviour during the three phases by gender

1st phase	Total (n = 1514) (%, 95% CI)	Boys (n = 720) (%, 95% CI)	Girls (n = 794) (%, 95% CI)	*p*
Suicidal ideation (CDI)				
I think of suicide but I would not do it	15.2% (13.5-17.1)	17.5% (14.9-20.5)	13.1% (10.9-15.6)	**.021**
I want to commit suicide	.7% (0.4-1.3)	.7% (0.3-1.6)	.8% (0.4-1.6)	.871
2nd phase	**Total (n = 562) (%, 95% CI)**	**Boys (n = 254) (%, 95% CI)**	**Girls (n = 308) (%, 95% CI)**	***p***
Suicidal ideation (CDI)				
I think of suicide but I would not do it	17.5% (14.5-20.9)	18.8% (14.3-24.1)	16.5% (12.7-21.1)	.647
I want to commit suicide	.7% (0.3-1.9)	.4% (0.1-2.3)	1.0% (0.3-2.9)	.756
Past suicidal risk M.I.N.I.-Kid	12.2% (10.5-13.9)	12.6% (10.2-15.0)	11.9% (9.7-14.2)	.334
Current suicidal risk M.I.N.I.-Kid	2.4% (1.6-3.1)	2.1% (1.0-3.1)	2.6% (1.5-3.7)	.981
3rd phase	**Total (n = 245) (%, 95% CI)**	**Boys (n = 98) (%, 95% CI)**	**Girls (n = 147) (%, 95% CI)**	***p***
Suicidal ideation (YI-4)				
I think about death or suicide	18.0% (13.7-23.3)	14.3% (8.7-22.6)	20.4% (14.7-27.6)	.292

CDI: Children's Depression Inventory; YI-4: Youth's Inventory-4

p<.05

Table 2 Psychopathologic disorders and current suicidal risk

Criterion	Any depressive disorder (%, 95% CI)	Any anxiety disorder (%, 95% CI)	Any disruptive disorder (%, 95% CI)	ADHD (%, 95% CI)	OCD (%, 95% CI)
Current suicidal risk	56.7% (39.2-72.6)	53.3% (36.1-69.8)	30.0% (16.7-47.9)	23.3% (11.8-40.9)	26.7% (14.2-44.5)
Current suicidal risk	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Non-adjusted	30.3 (13.1-70.0)***	4.0 (1.9-8.4)***	5.0 (2.2-11.6)***	2.7 (1.1-6.6)*	15.7 (5.8-42.4)***
	***R^2 Nagelkerke* * 100** = 29.2	***R^2 Nagelkerke* * 100** = 6.6	***R^2 Nagelkerke* * 100** = 5.9	***R^2 Nagelkerke* * 100** = 2.1	***R^2 Nagelkerke* * 100** = 11.9
	Chi-square $_{1.561}$ = 59.0	**Chi-square** $_{1.561}$ = 12.8	**Chi-square** $_{1.561}$ = 11.5	**Chi-square** $_{1.561}$ = 4.0	**Chi-square** $_{1.561}$ = 23.2
	p = .001***	***p*** = .001***	***p*** = .001***	***p*** = .044*	***p*** = .001***
Adjusted	30.3 (13.1-70.3)***	1.3 (.5-3.5)[d]	2.1 (.7-6.0)[d]	1.6 (.5-4.6)[d]	7.5 (2.1-27.4)**[d]
	***R^2 Nagelkerke* * 100** = 29.3	***R^2 Nagelkerke* * 100** = 29.4	***R^2 Nagelkerke* * 100** = 30.1	***R^2 Nagelkerke* * 100** = 29.6	***R^2 Nagelkerke* * 100** = 33.4
	Chi-square $_{3.559}$ = 59.6	**Chi-square** $_{4.559}$ = 59.3	**Chi-square** $_{4.559}$ = 60.7	**Chi-square** $_{4.559}$ = 59.6	**Chi-square** $_{4.559}$ = 67.8
	p = .001***	***p*** = .001***	***p*** = .001***	***p*** = .001***	***p*** = .001***

OR: Odds Ratio; CI: Confidence interval

*p<.001***; p<.01**; p<.05**

Adjusted by gender, age, and the presence of any depressive disorder (major depression and/or dysthymia).

[d]Depressive disorders

Table 3 Predictor factors of suicidal risk

Criteria	Current suicidal risk OR (95% CI)	*p*	Suicidal ideation 2nd phase OR (95% CI)	*p*
BOYS				
1st phase CDI	1.2 (1.0-1.3)	.004	1.1 (1.0-1.2)	.008
Suicidal ideation 1st phase			3.1 (1.2-.7.9)	.016
		***R^2 Nagelkerke* * 100 =** 29.8		***R^2 Nagelkerke* * 100 =** 27.1
		Chi-square $_{10.219}$ = 25.1		**Chi-square** $_{12.209}$ = 38.7
		p = .015*		***p*** = .001***
GIRLS				
1st phase SCARED	1.2 (1.0-1.3)	.027		
1st phase LOI-CV	1.1 (1.0-1.1)	.017		
Body satisfaction			.9 (.9-1.0)	.049
SES	.4 (.2-.9)	.024		
Suicidal ideation 1st phase	7.4 (1.2-44.9)	.030		
Birthplace			.3 (.1-.7)	.007
		***R^2 Nagelkerke* * 100 =** 59.5		***R^2 Nagelkerke* * 100 =** 26.2
		Chi-square $_{12.276}$ = 60.4		**Chi-square** $_{12.266}$ = 43.5
		p = .001***		***p*** = .001***

CDI: Children's Depression Inventory; SCARED: Screen for Children's Anxiety Related Emotional Disorders; LOI-CV: Leyton Obsessional

Inventory-Child Version; SES: Socioeconomic status; BMI: Body Mass Index

Variables selected for use in the regression models: Age (total score); 1st phase CDI (total score); 1st phase SCARED (total score), 1st phase LOI-CV (total score);

Suicidal ideation of the 1st phase (0: no, 1: yes); 1st phase BMI (total core); School problems (0: no, 1: yes); Death of a person close to them (0: no, 1: yes);

Body satisfaction (total score); SES (total score); Family type (0: non-nuclear, 1: nuclear); Birthplace (0: foreign, 1: native)

*p<.001***; p<.01**; p<.05**