

Adriana Díez-Gómez^{1,2}
Carla Sebastián Enesco^{2,3}
Alicia Pérez-Albéniz^{1,2}
Eduardo Fonseca Pedrero^{1,2}

Suicidal behavior assessment in adolescents: Validation of the SENTIA-Brief scale

¹ Department of Education Sciences, University of La Rioja, Spain

² Programa Riojano de Investigación en Salud Mental (PRISMA), España

³ Department of Research and Psychology in Education, University Complutense of Madrid, Spain

ABSTRACT

Introduction. Suicide is a social-health problem in the youth population worldwide; however, there are no measuring instruments specifically designed for use in Spanish adolescents. The main goal of this work was to analyze the psychometric properties of a new measuring instrument, called SENTIA-Brief, for suicidal behavior assessment in Spanish adolescents.

Method. A total of 1,790 students selected by sampling stratified by conglomerates participated in the survey. The average age was 15.70 years ($SD = 1.26$), 53.7% being girls. Different instruments to assess suicidal behavior and socio-emotional and behavioral adjustment were used.

Results. Between 4% and 15% of adolescents scored positively at least on one item of the SENTIA-Brief scale. Women showed significantly higher scores than men in the total score. An essentially one-dimensional structure was found. No items showed differential functioning by gender. The reliability was adequate ($\Omega = .97$). SENTIA-Brief scores were positively associated with suicidal ideation, symptoms of depression, mental health problems, and psychotic-like experiences.

Conclusions. SENTIA-Brief seems to be a simple and brief instrument with adequate psychometric properties that allows the assessment of suicidal behavior in young Spaniards. In addition, SENTIA-Brief can be used as a screening tool, both in clinical and educational settings, to detect individuals at risk for suicidal behavior in order to prevent this problem and its negative consequences associated.

Keywords: adolescents, suicidal behavior, assessment, prevention, SENTIA

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Correspondence:

Eduardo Fonseca Pedrero
University of La Rioja
Department of Education Sciences
C/ Luis de Ulloa, 2 (Edificio Vives)
26004, Logroño, Spain
Tlf: (+34) 941 299 396
E-mail: eduardo.fonseca@unirioja.es

RESUMEN

Introducción. El suicidio es un problema socio-sanitario en población juvenil a nivel mundial; sin embargo, no existen instrumentos de medida específicamente diseñados para su uso en adolescentes españoles. El principal objetivo de este trabajo fue analizar las propiedades psicométricas de un instrumento, denominado SENTIA-Breve, para la evaluación de la conducta suicida en adolescentes españoles.

Metodología. Participaron 1790 estudiantes seleccionados mediante un muestreo estratificado por conglomerados. La media de edad fue 15,70 años ($DT = 1,26$), siendo el 53,7% chicas. Se utilizaron diferentes instrumentos que valoraban la conducta suicida y el ajuste socio-emocional y conductual.

Resultados. Entre un 4% y un 15% de los adolescentes puntuaron afirmativamente en al menos un ítem de la escala. Las mujeres mostraron puntuaciones medias significativamente más altas que los varones. Se encontró una estructura esencialmente unidimensional. Ningún ítem mostró funcionamiento diferencial en función del género. La fiabilidad de las puntuaciones fue alta ($\omega = 0,97$). Las puntuaciones de SENTIA-Breve se asociaron positivamente con ideación suicida, síntomas de depresión, problemas de salud mental y experiencias psicóticas atenuadas.

Conclusiones. SENTIA-Breve parece ser un instrumento de medida breve, sencillo y con adecuadas propiedades psicométricas que permite la evaluación de la conducta suicida en jóvenes españoles. Además, SENTIA-Breve se puede utilizar como una herramienta de cribado, tanto en entornos clínicos como educativos, para detectar a personas con riesgo de conducta suicida de cara a prevenir este problema y sus negativas consecuencias.

Palabras clave: adolescentes, conducta suicida, evaluación, prevención, SENTIA

INTRODUCTION

Suicidal behavior is a major health problem that have devastating consequences at personal, familiar, educational and social-sanitary levels¹. Consummated suicide is the second cause of death worldwide in adolescents and young adults, and one of the leading causes of premature death and years of disability associated in life^{2,3}. Therefore, prevention is a priority line of action. In this respect, suicide prevention strategies can be exercised at universal, selective and indicated levels^{1,4-6} (e.g., healthcare setting, communication media, controls preventing access to weapons), one of the most relevant strategy being early detection of potential high-risk cases and effective prophylactic intervention, if necessary. Previous studies have shown the efficacy of several programs for early suicide risk detection and prevention in young people^{5,7-9}. However, this necessarily relies on the use of reliable measuring tools specifically developed and validated for the assessment of suicidal behavior in targeted populations, such as Spanish populations.

Suicidal behavior is a multidimensional and multifactorial phenomenon, associated with taboo and stigma. Consequently, its conceptual and empirical delimitation, etiology, assessment, prevention, and intervention is a complex task with a non-easy solution^{6,10,11}. Indeed, many questions related to suicidal behavior are nowadays unsolved. Suicide is defined as a fatal self-harming act with the intention to die. However, suicidal behavior encompasses different manifestations that vary from suicidal ideation (suicide planning, ideas and/or thoughts of death), suicidal communication (threats, verbal and non-verbal formulation), to suicidal act (suicidal behavior and/or self-injury acts and the suicidal act itself)^{6,12,13}. Thus, suicide is a multi-faceted phenomenon, not limited to the consummated act of suicide. As a matter of fact, the risk of suicide consummation for a particular individual is theoretically determined by his/her prior manifestations along the *continuum* from suicidal ideation to suicidal act. Current etiological models of suicidal behavior reveal that the determinants of suicide result from a complex and dynamic interaction between biological, psychological, clinical, environmental and socio-cultural factors^{12,14} particular to each individual as a function of his/her past history and specific circumstances^{15,16}.

The prevalence of suicidal behavior in Spain and worldwide is high, in particular, among adolescents and young adults. For example, in Spain, in 2017, a total of 3,679 individuals died by suicide. According to the Spanish National Statistics Institute (INE, 2017), 259 children and young people under 30 years took their own lives in Spain, with 73% of males (188 males and 71 females). A

recent meta-analysis¹⁷ reveals that life prevalence and 12-month prevalence for suicide attempts in adolescents is 6% (95% CI: 4.7-7.7%) and 4.5% (95% CI: 3.4-5.9%), respectively. Regarding suicide ideation, life prevalence corresponds to the 18% of adolescents (95% CI: 14.2-22.7%) and 12-month prevalence to 14.2% (95% CI: 11.6-17.3%). Among adolescents and young adults, females present a higher risk of suicide attempt (OR 1.96; IC 95% 1.54-2.50) whereas males display a higher risk of suicide consummation (HR 2.50; IC 95% 1.8-3.6)¹⁸. In Spain, life prevalence for suicide ideation is around 30%, whereas life prevalence for suicide attempts corresponds to approximately 4%^{19,20}.

Several risk factors have been associated with suicidal behavior in adolescent population^{11,18,21,22} aged 12-26 years, yet the predictive and prognostic ability across specific risk factors is still limited²¹. Among the youngsters, the presence of mental disorders or psychopathology (e.g., affective disorders), suicidal ideation, prior suicide attempts, legal and illegal substance use, family history of suicide attempts or sexual abuse, and scholar absenteeism²³⁻²⁷ are found to have a significant risk impact on the individuals' suicide disposition. With respect to completed suicide, one of the principal risk factors is having a history of prior suicide attempts²³⁻²⁶. In addition, young people with suicidal behavior -in any of its manifestations- also refer, among others, a higher number of emotional and behavioral problems, increased substance use, more impulsivity and risk behaviors, lower self-esteem, fewer emotional regulation skills, lower school performance, and worst quality of life^{20,28-31}.

There is, in previous literature, a wide range of measuring instruments for the assessment of suicidal behavior^{32,33}. Some of the most used are the Columbia Suicide Severity Rating Scale (C-SSRS)³⁴, the Beck Scale for Suicide Ideation (BSI)³⁵, and the Paykel Suicide Scale (PSS)³⁶. Nevertheless, to the best of our knowledge, there is not a specific tool designed and validated for the assessment of suicidal behavior in Spanish adolescents. To this end, Díez-Gómez et al.³⁷ developed SENTIA: An Adolescent Suicidal Behavior Assessment Scale, based upon validated theoretical models¹⁴ and following the international guidelines for test construction³⁸. The SENTIA scale is composed of 16 items in a dichotomic format (yes/no). A sample of 1,790 students selected by stratified random cluster sampling was used to construct and validate the scale. The results of the exploratory and confirmatory factor analyses suggest that the dimensional structure that best explained the SENTIA scores comprised a bifactor model, specified in a general suicidal behavioral factor plus three specific factors (Ideation, Communication, and Act/Planning). SENTIA scores showed adequate levels

of reliability. None of the SENTIA items showed differential functioning by gender. Moreover, SENTIA scores were positively associated with suicidal ideation, depression symptoms, emotional and behavioral problems, and psychotic-like experiences³⁷.

SENTIA is an adequate instrument for the assessment of suicidal behavior in Spanish adolescents³⁷, however, the development of a brief version may be valuable both for clinical and research purposes. On one hand, a brief version of SENTIA can be administered as a fast, effective and noninvasive screening tool. On the other hand, SENTIA-Brief can benefit scholars who investigate other related phenomena but might be interested in gathering information about suicidal behavior.

Within this particular research context, the goal of the present study was to develop and validate a short scale, SENTIA-Brief for suicidal behavior assessment in Spanish adolescents. Derived from this general goal, we were interested in the following specific objectives: a) studying the internal structure underlying the SENTIA-Brief scores; b) estimating the reliability of the SENTIA-Brief scores; c) analyzing the prevalence rates of suicidal behavior; d) testing the potential effects of age and gender in suicidal behavior; e) analyzing the SENTIA-Brief scores in relation to the 16 items of the extended version of SENTIA, as well as other indicators of mental health and social-emotional adjustment, f) establishing the corresponding normative data. We expect SENTIA-Brief scores to present adequate psychometric properties both in terms of reliability and validity.

METHOD

Participants

In order to ensure the representativeness of the sample, we conducted in 2019 a stratified random cluster sampling at the classroom level, and in a population of about 15,000 students belonging to the Autonomous Region of La Rioja (Spain). The strata were created attending to the type of school (public/private) and the school stage (compulsory stage, post-compulsory, and vocational training), where the likelihood of classroom extraction was determined as a function of the total number of students.

The initial sample consisted of 1,972 students. Participants with a high score in the Oviedo Infrequency Scale³⁹ (more than two points) ($n = 146$) were removed from the sample. Likewise, we eliminated those participants older

than 19 years ($n = 36$). Thus, the final sample was composed of 1,790 students, with 816 (45.6%) males, 961 female (53.7%), and 13 participants with gender diversity (.7%). The participants belonged to 30 different school centers and a total of 98 classrooms. The mean age was 15.70 years ($SD = 1.26$), ranging from 14 to 18 years of age.

The nationality distribution of the participants was as follows: 89.4% Spanish, 2.5% Rumanian, 1.9% Latin-American (Bolivia, Argentina, Colombia, and Ecuador), 1.4% Marroquin, 0.8% Pakistani, 0.3% Portuguese, and 3.8% from other nationalities.

Instruments

SENTIA: An Adolescent Suicidal Behavior Assessment Scale³⁷. The SENTIA scale is a self-report instrument designed for the assessment of suicidal behavior in adolescents. The extended version consists of 16 items in a dichotomic format (Yes = 1; No = 0). SENTIA assesses a general suicidal behavior factor plus three specific factors (Ideation, Communication, and Act/Planning). Previous studies indicate that SENTIA scores present adequate psychometric properties³⁷. SENTIA-Brief items are shown in Annex I (see Annex II for the Scoring system).

The Paykel Suicide Scale (PSS)³⁶. The PSS is a self-report tool designed for the evaluation of suicidal behavior in the past year. It consists of a total of 5 items with a dichotomous response system (Yes = 1; No = 0). Specifically, the PSS evaluates thoughts of death (items 1 and 2), suicidal ideation (items 3 and 4), and suicidal attempt (item 5). Scores range from 0 to 5. The Spanish adaptation of the PSS has demonstrated adequate psychometric properties in Spanish adolescents¹⁰.

Personal Wellbeing Index-School Children (PWI-SC)^{40,41}. The PWI-SC was developed to assess subjective wellbeing in school-age children and adolescents. The PWI-SC contains a total of 8 items, each rated on a 0- to 10-scale (0 = Very sad to 10 = Very happy). In this research, only the first item of the PWI-SC was used (overall satisfaction). Previous studies with Spanish adolescents indicate that the PWI-SC has adequate psychometric properties⁴².

The Strengths and Difficulties Questionnaire (SDQ), self-report version⁴³. The SDQ is a self-report instrument used to screen for behavioral and emotional difficulties, and social skills. The SDQ consists of a total of 25 items grouped into five subscales: Emotional symptoms, Conduct problems, Hyperactivity, Peer problems, and Prosocial behavior. Each item is rated on a 3-point scale (with 0 = "Not true", 1 = "Somewhat true", and 2 = "Certainly

true"). Higher scores reflect behavioral and emotional difficulties, except for the Prosocial Behavior subscale where higher scores refer to a better social adjustment. The Spanish adaptation of the SDQ has demonstrated adequate psychometric properties in Spanish adolescents^{44,45}.

The Rosenberg Self-esteem Scale (RSES)⁴⁶. The RSES is a unidimensional scale that measures global self-esteem. It consists of 10 items (e.g., On the whole, I am satisfied with myself), each scored on a 4-point Likert scale (1 = "Strongly disagree" to 4 = "Strongly agree"). In the present study, we used the validated Spanish version that has adequate psychometric properties⁴⁷.

The Reynolds Adolescent Depression Scale-Short Form (RADS-SF)⁴⁸. The RADS-SF is a self-report questionnaire used to assess the severity of depressive symptomatology in adolescents (Anhedonia/Negative Affect, Somatic Complaints, Negative Self-Evaluation and Dysphoric Mood). It is composed of 30 items in a Likert response format with 4 options (1 = "almost never" to 4 = "most of the time"). The validated Spanish version was used for the present study⁴⁹.

The Prodromal Questionnaire-Brief (PQ-B)⁵⁰. The PQ-B is a self-report measure designed to identify attenuated psychotic symptoms that characterize the schizophrenia prodrome. It contains 21 dichotomic items (true/false). The PQ-B asks additional questions regarding extent/severity of impairment and distress, rated on a 5-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree"). The Spanish adaptation of the PQ-B has demonstrated adequate psychometric properties in terms of reliability and revealed a unidimensional factorial structure in Spanish adolescents⁵¹.

The Oviedo Infrequency Scale (INF-OV)³⁹. The INF-OV was developed to detect those participants who responded in a random, pseudorandom or dishonest manner. The INF-OV instrument is a self-report composed of 12 items in a 5-point Likert-scale format (1 = "Completely disagree" to 5 = "Completely agree"). Students with more than two incorrect responses on the INF-OV scale are removed from the sample.

Procedure

The research was approved by the Directorate-General for Education of the Regional Government of La Rioja, and the Ethics Committee of Clinical Research of La Rioja (CEICLAR).

In order to standardize the test administration process, all researchers were given a protocol with specific instructions on how to proceed before, during and after administration. The test battery was administered collectively, through personal computers, in groups of 10 to 30 students.

Participants were informed of the confidentiality of their responses and of the voluntary nature of the study. No incentive was provided for their participation. Parents or legal tutors were asked to provide a written informed consent in order for their child to participate in the study.

Data analysis

First, we selected the five items of the SENTIA-Brief scale following theoretical and psychometric criteria, and performed a cross validation sampling method by randomly dividing the total sample into two subsamples. We conducted an exploratory factor analysis in the first random subsample ($n = 866$), and a confirmatory factor analysis in the second random subsample ($n = 924$).

For the exploratory factor analysis, we used the Minimum Rank Factor Analysis method, a tetrachoric correlations matrix and an optimal implementation of parallel analysis. For the confirmatory factor analysis, we tested a one-factor structure using the weighted least squares mean and variance adjusted (WLSMV) estimation method. To test the model fit, the following goodness-of-fit indices were used: Root Mean Square Error of Approximation (RMSEA) and the 90% confidence interval, Weighted Root Mean Square Residual (WRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). For CFI and TLI, values of .95 or more suggest a good model fit. For RMSEA, values of .08 or less indicate a reasonable model fit and values of .05 or less indicate a good model fit⁵².

In addition, to further explore the internal structure of the SENTIA-Brief scores, we analyzed the differential item functioning (DIF) by gender. DIF represents one of the main threats to the validity of test score interpretations for a particular measuring instrument⁵³. In the present work, the Mantel-Haenszel procedure (CMH)⁵⁴ was applied, considering $p < .01$ to be statistically significant. Multiple comparisons were corrected using the Holm and Benjamini-Hochberg procedure. *DifR* package was used for this analysis.

Second, Omega coefficient was calculated as a measure of the reliability of the SENTIA-Brief scores. In ad-

dition, the test information function was estimated from the Item Response Theory (IRT) perspective⁵⁵.

Third, we calculated descriptive statistics for the measures. In order to analyze the potential effects of gender and age of participants in the SENTIA-Brief scores, we conducted a MANOVA with Gender and Age as between-subject factors, and SENTIA-Brief scores as the dependent variable. Wilks's Lambda value was used to test for differences among the dependent variables altogether. Partial eta squared (partial η^2) was used as index of effect size.

Fourth, in order to gather validity evidences for the SENTIA-Brief scale, we computed the Pearson matrix correlation between the SENTIA-Brief scores, the extended version of SENTIA (16 items) scores as well as other indicators of social-emotional and behavioral adjustment. Finally, normative data using percentile values were calculated by gender.

SPSS 24⁵⁶, FACTOR⁵⁷, and R⁵⁸ were used for these analyses.

RESULTS

Item selection

For the construction of SENTIA-Brief, we selected 5 out of the 16 items composing the extended version of SENTIA (items 1, 3, 10, 12 and 16), on the basis of the following theoretical and psychometrical criteria:

1. All suicide manifestations derived from the theoretical models on suicidal behavior were represented: desire (item 1), ideation (item 2), planning (item 3), communication (item 4), and behavior (item 5).
2. We selected items from the three specific factors presented in the extended version of SENTIA. But due to the heterogeneous number of items by factor, we chose two items from the Act/Planning factor (item 3 and 5), two items from the Ideation/Hopelessness (items 1 and 2), and only one item from the Communication factor (item 4).
3. The selected items showed higher factor loadings both in the specific and the general factor (Table 2).

4. The selected items presented higher levels of accuracy estimating the suicidal behavior latent trait resulted from the IRT perspective.

Validity evidence based on internal structure

Exploratory factor analysis

The sampling adequacy measure was 7162.4 ($p < .001$) and the Kaiser-Meyer Olkin (KMO) was .91. The explained total variance for the first factor (with a value of 4.55) was 90.1%. As shown in Table 1, all items presented factor loadings higher than 0.30. The parallel analysis resulted in the extraction of a single factor. Thus, the underlying factorial structure of the SENTIA-Brief scores seemed to be essentially unidimensional.

Confirmatory factor analysis

The unidimensional model found in the exploratory analysis showed adequate goodness-of-fit values ($\chi^2 = 8.715$, $df = 5$, $p = .12$, RMSEA = .028, 90%CI [0-.059], WRMR = .043, CFI = .99; TLI = .99). All standardized factor loading estimates were statistically significant ($p < .001$) (see Table 1).

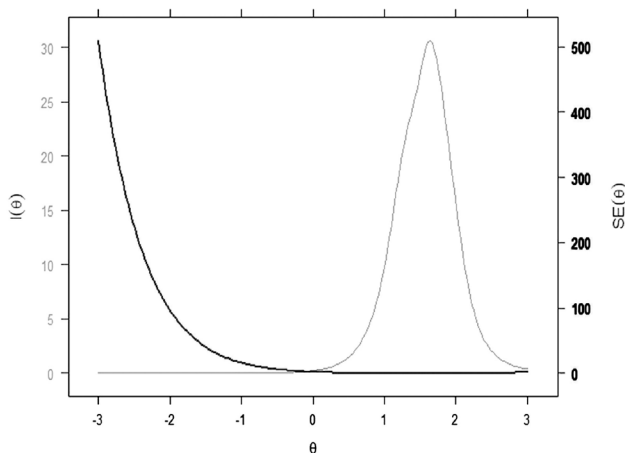
| Table 1 | Factor loadings estimated from the exploratory factor analysis (first subsample) and from the confirmatory factor analysis (second subsample) for the SENTIA-Brief items | |
|---------|--|------------------------------|
| | Exploratory factor Analysis | Confirmatory factor Analysis |
| Item | FI | FI |
| 1 | .856 | .860 |
| 2 | .978 | .984 |
| 3 | .989 | .953 |
| 4 | .905 | .964 |
| 5 | .924 | .922 |

Differential item functioning by gender

None of the items of SENTIA-Brief showed differential functioning by gender.

Reliability and accuracy estimation of the scores

The estimation of the reliability of the SENTIA-Brief scores was carried out with the Omega coefficient in the total sample. The value for the total score was .97. All the discrimination indexes were higher than .30. In addition, the accuracy of the scores was calculated from the IRT perspective. Figure 1 depicts the test information function for the SENTIA-Brief. As it can be seen, the higher level of accuracy to estimate the suicidal behavior latent trait ranged between values of 1 and 2.



Dark line= standard error (SE);
Light line: information function

Figure 1 | Test Information Function: SENTIA-Brief (total sample)

Descriptive statistics and mean comparisons by gender and age

Table 2 displays the descriptive statistics for the SENTIA-Brief items (mean, standard deviation, skewness, and kurtosis) in the total sample. For instance, a 15% of the participants answered affirmatively to the question: "¿Has deseado estar muerto?" [Have you ever wished you were dead?].

| Table 2 | | Descriptive statistics of the SENTIA-Brief items (total sample) | | | |
|---------|------|---|----------|----------|----------------------|
| Item | Mean | SD | Skewness | Kurtosis | Discrimination index |
| 1 | .05 | .22 | 4.17 | 15.44 | .56 |
| 2 | .05 | .23 | 3.92 | 13.36 | .74 |
| 3 | .04 | .18 | 5.05 | 23.52 | .63 |
| 4 | .10 | .30 | 2.62 | 4.86 | .74 |
| 5 | .15 | .36 | 1.94 | 1.75 | .63 |

The Wilks lambda value revealed the existence of statistically significant differences by gender in the SENTIA-Brief total score ($Wilks \lambda = .98, F = 9.49, p < .01, partial \eta^2 = .011$). A subsequent ANOVA confirmed this finding [$M_{male} = .26; SD_{male} = .84; M_{female} = .49; SD_{female} = 1.14; F_{(1, 1767)} = 18.84, p < .01, partial \eta^2 = .011$], indicating that female participants displayed higher scores than did male participants. Neither the main effect of age ($Wilks \lambda = .995; F = 1.217; p > .05; partial \eta^2 = .003$), nor the interaction between age and gender ($Wilks \lambda = .004; F = .939; p > .05; partial \eta^2 = .002$) were found to be statistically significant.

Validity evidence based on relations to other variables

The correlation between the scores on the two SENTIA versions (extended and brief) was high. Results are displayed in Table 3. The concurrent validity of the SEN-

| Table 3 | | Pearson correlation matrix between the two versions of SENTIA, extended and brief, in the total sample of participants | | | |
|-----------------|---------------|--|---------------|-----------------|--|
| | Act/ Planning | Ideation | Communication | SENTIA extended | |
| Ideation | .657** | | | | |
| Communication | .540** | .532** | | | |
| SENTIA extended | .853** | .934** | .708** | | |
| SENTIA-Brief | .825** | .874** | .665** | .946** | |

** $p < .01$

TIA-Brief was also investigated through its correlation with other indicators of mental health and social-emotional adjustment. Results are presented in Table 4. On one hand, SENTIA-Brief scores were positively and statistically significantly correlated with suicidal behavior (Paykel Scale), depressive symptoms (RADS-B), emotional and behavioral difficulties (SDQ), and psychotic-like experiences (PQ-B). On the other hand, negative statistically significant correlations were found between SENTIA-Brief scores and emotional wellbeing (PWI-SC), self-esteem (Rosenberg scale), and prosocial behavior (SDQ) scores.

| Table 4 | | Pearson correlation matrix between SENTIA-Brief scores and psychometric and social-emotional adjustment indicators (total sample) |
|----------------------------------|--------------|---|
| Variables | SENTIA-Brief | |
| Personal wellbeing | -.458** | |
| Self-esteem | -.475** | |
| Emotional problems | .373** | |
| Conduct problems | .214** | |
| Peer problems | .357** | |
| Hyperactivity | .158** | |
| Prosocial behavior | -.074** | |
| Depressive symptoms | .570** | |
| Suicidal behavior (Paykel Scale) | .768** | |
| Psychotic-like experiences | .359** | |

** $p < .01$

Normative data

Since statistically significant differences were found by gender in the mean scores, the percentiles were computed independently for females and males (see Table 5).

| Table 5 | | | | Normative data for females and males for the SENTIA-Brief |
|------------|---------------------|-------------------|------------|---|
| Percentile | Total score Females | Total score Males | Percentile | |
| 1 | - | | 1 | |
| 50 | - | | 50 | |
| 70 | - | | 70 | |
| 75 | - | | 75 | |
| 80 | 1 | | 80 | |
| 85 | 1 | | 85 | |
| 90 | 2 | 1 | 90 | |
| 93 | 3 | 1 | 93 | |
| 95 | 4 | 2 | 95 | |
| 96 | 4 | 2 | 96 | |
| 97 | 4 | 3 | 97 | |
| 98 | 5 | 4 | 98 | |
| 99 | 5 | 5 | 99 | |
| <i>N</i> | 961 | 816 | <i>N</i> | |
| Mean | .49 | .26 | Mean | |
| <i>SD</i> | 1.15 | .84 | <i>SD</i> | |
| SEM | .04 | .03 | SEM | |

CONCLUSIONS

The present work represents the first attempt to develop and validate a specific and fast screening tool to assess suicidal behavior in Spanish adolescents. The SENTIA-Brief scale (the Adolescent Suicidal Behavior Assessment Scale-Brief) was designed following the international guidelines for test construction and tested in a representative sample of Spanish adolescents. Results suggest that SENTIA-Brief scores presented adequate psychometric properties that allows making informed decisions. More specifically, a validated and reliable tool aimed at identifying the different suicide manifestations among adolescents may help advance our understanding of the phenomenon, as well as improve the assessment and prevention of suicidal behavior.

The development and validation of this new instrument is justified by the high prevalence of suicidal behavior (not limited to consummated suicide), and its dramatic impact at a personal, school, familiar and social health level, on our present and future society. Certainly, it is essential to implement

measures and strategies aimed at preventing, mitigating, and eventually eradicating this major social problem worldwide. Therefore, the current situation requires, among other actions, the implementation of reliable early detection and identification programs in order to accurately apply early preventive interventions. This necessarily relies on the use of measuring instruments specifically designed and validated in adolescent populations and that ultimately allows acting precisely, fast, and efficiently before the problem could escalate.

The present findings reveal that the suicide prevalence rates were similar to those reported in previous studies. A recent meta-analysis shows that life prevalence and 12-month prevalence for suicide attempts was 6% and 4.5%, respectively¹⁷. Regarding suicide ideation, life prevalence corresponded to 18% and 12-month prevalence to 14.2%. In studies with Spanish adolescent populations, the prevalence for high-risk suicidal behavior was around 4%²⁰. Altogether these findings indicate that the prevalence for suicidal behavior among adolescents is high; depends on the type of suicide manifestation (thoughts, communication, act) as well as other factors (age, gender, etc.); and importantly, it is not solely confined to completed suicide.

As mentioned above, the SENTIA-Brief scores presented adequate psychometric properties. First, results from the analysis of the internal structure showed that the SENTIA-Brief was composed of a general factor of suicidal behavior. Although all the suicide manifestations were included in the scale to ensure its content validity, this is not surprising due to the small number of items. As a matter of fact, previous studies using the Paykel Suicide Scale in adolescents yielded similar findings¹⁰. Be that as it may, the unidimensional structure found here depends, as is well known, on different variables, such as the characteristics of the sample, the type and number of items, as well as the psychometric approach used in the analysis of internal structure. Yet, in spite of this, the SENTIA-Brief scale comprehends all spectra of suicidal behavior accounted for in the current theoretical models¹²⁻¹⁴.

Second, the reliability estimation of the SENTIA-Brief scores yielded values over .90. In addition, the information function resulted from the IRT perspective indicated that SENTIA-Brief scale measures accurately the higher scores of the latent suicide trait. This is a relevant finding from an applied perspective. The SENTIA-Brief scale was primarily designed as a screening tool, and in particular, to identify participants with a certain suicide risk. Therefore, the latent trait should be measured with lower error probability within this particular range of the information function. Moreover, none of the SENTIA-Brief items displayed a differential functioning by gender. This result guaranteed the equivalence in the assessment process of SENTIA-Brief. The normative data for the SENTIA-Brief scale were generated from a represen-

tative sample of adolescents selected by a stratified random cluster sampling, and thus, they reasonably ensure accurate comparisons of scores.

Third, validity evidences based on external variables were gathered. On one hand, the two versions of SENTIA (extended and brief) presented a correlation coefficient close to one, indicating that in this particular study, little information will be lost, at least from a statistical point of view, if only using the brief version of SENTIA. On the other hand, SENTIA-Brief scores were positively correlated with other suicide risk measures, such as the Paykel Suicide Scale, depressive symptoms, emotional and behavioral difficulties, and subclinical psychotic experiences (i.e., a psychosis risk indicator). Moreover, the SENTIA-Brief scores were negatively associated with emotional wellbeing, self-esteem and prosocial behavior. These findings are in line with previous studies where young people with suicidal behavior (e.g., suicide ideation, communication or suicide acts) refer, among others, a higher number of emotional and behavioral problems, substance disorders, more impulsivity and risk behaviors, worst quality of life, lower self-esteem, and fewer emotional regulation skills^{22,28,29,31}. In addition, these results evince the validity of the SENTIA-Brief scale in relation to other external variables, which in turn guarantees an accurate inferential process in face of the decision making and the construction of nomological networks.

The SENTIA-Brief allows to analyze the suicidal behavior in Spanish adolescents and to ensure a broader understanding of the individual by detecting and identifying potential risk cases (with the subsequent purpose of conducting a more comprehensive psychological assessment). Ultimately, this may improve the decision-making process in face of the implementation of prophylactic interventions as well as the management of social-health resources. The SENTIA-Brief scale should be used as a screening tool for suicidal behavior in adolescents in a wide range of contexts, such as the clinical, research, school and social-health settings, to mention a few. Importantly, the SENTIA-Brief scores should be interpreted in relation and interaction with biological, psychological, environmental and social factors, by considering the individual and his/her past history within the bio-psycho-social framework. In addition, both versions of SENTIA, extended and brief, should be exercised together with other procedures and tools, such as interviews, observational scales, etc. to promote an accurate decision-making process. The clinical judgment represents a key variable in the field of suicidal behavior, so SENTIA-Brief complements the work performed by the professional psychologist.

To sum up, SENTIA-Brief is a brief, useful and easy screening tool with adequate psychometric properties that covers an urgent need in the field of Spanish psychological assessment, i.e., a specific instrument for suicidal behavior assessment in

Spanish adolescents. Youth suicide is an increasingly frequent health problem worldwide. Thus, it is essential to fight against all myths and taboos historically linked to suicidal behavior and to promote evidence-based programs aimed at mitigating this problem. Future research should study the SENTIA-Brief scale in new samples from different populations. Also, it is necessary to further examine SENTIA-Brief in relation to other variables from multiple levels of analysis (e.g., genetic, brain, neurocognitive, psychological, social), and using different procedures, such as ambulatory assessment.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding this article.

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| Annex 1 | SENTIA-Brief scale | |
|--|--------------------|----|
| Below are a number of statements. Please, respond sincerely, attending to your way of thinking and feeling in the last 6 months. Thank you very much for your cooperation | | |
| Have you ever wished you were dead? | Yes | No |
| Have you ever had ideas about taking your life? | Yes | No |
| Have you planned to take your life? | Yes | No |
| Have you told anyone that you want to take your life? | Yes | No |
| Have you tried to take your own life? | Yes | No |

| Annex 2 | Scoring system |
|--|----------------|
| Total score: | |
| Sum of the items of positive answer (Yes=1; No=0) | |
| A higher score indicates higher severity or risk of suicide. | |
| Act/Planning: Items 5 and 3. | |
| Communication: Item 4. | |
| Ideation: Items 1 and 2. | |