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Methodology

Nonsuicidal Self-Injury Thoughts and Behavior in Adolescents: Validation of SITBI-NSSI

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ABSTRACT

Background: The lack of knowledge about Nonsuicidal Self-Injury (NSSI) in Spanish adolescents, especially NSSI thoughts may be due to the paucity of NSSI assessment instruments with validity evidence in this sample. The aim of this study was to assess NSSI thoughts and behavior. In addition, the study examined the association between various NSSI features and suicidal behavior and included a preliminary validation of the new Self-Injurious Thoughts and Behaviors Interview - Non-Suicidal Self-Injury (SITBI-NSSI). **Method:** 685 Spanish adolescents between 13 and 18 years old (M = 15.58, SD = 1.08; 60.9% girls) completed measures of NSSI features and suicidal behavior. **Results:** Among adolescents, 19% thought about self-injury, and 16.8% presented NSSI behaviors. The girls had higher levels of NSSI, as well as greater frequency, number of functions, methods, and suicidal thoughts and desire. Some of the functions, methods, and precipitants differed by sex. Those with ANS had a higher risk of suicidal behavior than the comparison group. The association of SITBI-NSSI with other measures supports the validity of the data. **Conclusions:** Most features of NSSI are similar to those found in Spanish and internationally. The SITBI-NSSI could facilitate the evaluation of NSSI in Spanish adolescents.

Pensamientos y Conductas de Autolesión no Suicida en Adolescentes: Validación de la SITBI-NSSI

Palabras clave:
Autolesión no Suicida
SITBI-NSSI
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RESUMEN

Antecedentes: La falta de conocimiento sobre la autolesión no suicida (ANS) en adolescentes comunitarios españoles, especialmente los pensamientos ANS, puede deberse a la escasez de instrumentos de evaluación ANS con evidencias de validez. El objetivo del estudio fue evaluar los pensamientos y el comportamiento de ANS. Además, se examinó la asociación entre varias características de ANS y conducta suicida, y se llevó a cabo la validación preliminar de la nueva Entrevista de pensamientos y comportamientos autolesivos - Autolesión no suicida (SITBI-ANS). **Método:** 685 adolescentes españoles entre 13 y 18 años (M = 15.58, DT = 1.08; 60.9% chicas) completaron medidas de características ANS y conducta suicida. **Resultados:** El 16.8% presentó conductas ANS y el 19% lo pensó. Las chicas tuvieron mayor presencia de ANS, frecuencia, número de funciones, métodos, pensamientos y deseo suicida. Algunas de las funciones, métodos y precipitantes diferieron según el sexo. Aquellos con ANS tuvieron más riesgo de conducta suicida respecto al grupo de comparación. La asociación de SITBI-ANS con otras medidas apoya la validez de los datos obtenidos. **Conclusiones:** La mayoría de las características de ANS son similares a las encontradas en español e internacionalmente. SITBI-ANS facilitaría la evaluación de ANS en adolescentes españoles.

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Nonsuicidal Self-Injury (NSSI) refers to the "deliberate and self-inflicted destruction of body tissue without suicidal attempt and without the purpose of being sanctioned by society" (Nock & Favazza, 2009, p. 9). NSSI onset typically occurs in adolescence, between ages 13 and 16 (Muehlenkamp et al., 2019). In community samples from several countries, adolescents present a high life prevalence of NSSI (17.2%; Swannell et al., 2014). The few studies of prevalence of NSSI in Spanish community adolescents show disparate prevalences (0.58% - 74.9%; Bousoño et al., 2021; Brunner et al., 2014; Calvete et al., 2015, 2017; Faura-Garcia, Orue, et al., 2021a; Kirchner et al., 2011; Pérez et al., 2021). There is no consensus on sex differences in the prevalence of NSSI. Thus, while one meta-analysis found that women had more NSSI (Bresin & Schoenleber, 2015), another found no significant differences (Swannell et al., 2014).

The four-function model (Nock & Prinstein, 2004) proposes that NSSI is maintained by four types of reinforcement: automatic negative reinforcement (ANR; NSSI serves to reduce adverse states), automatic positive reinforcement (ARP; NSSI serves to generate positive feelings), social negative reinforcement (SNR; NSSI allows escaping from situations or interpersonal demands), and social positive reinforcement (SPR; NSSI to ask for attention or resources). Intrapersonal functions are the most reported (63-78%; Taylor et al., 2018), also among Spanish community adolescents (Calvete et al., 2015).

Various authors have highlighted the need to differentiate between NSSI thoughts and NSSI behavior as different processes (Kiekens et al., 2018), which allow establishing finer patterns of NSSI (Marraccini et al., 2020). A systematic review found that NSSI thoughts and behavior occurred in different contexts (Rodríguez-Blanco et al., 2018).

Regarding suicidal behavior, a meta-analysis found that after suicidal ideation, the strongest predictors for suicide attempts were the frequency and number of NSSI (Victor & Klonsky, 2014). NSSI thoughts increase the risk of later suicidal ideation and plan, whereas NSSI behavior increases the risk of suicidal ideation, plan and attempt (Kiekens et al., 2018). Kirchner et al. (2011) found that 12.5% of Spanish community adolescents had suicidal ideation. These were 12.2 times more likely to perform NSSI behavior than those who did not have suicidal ideation, and the risk was higher in girls than in boys. In another study, 6.4% of the adolescents reported suicide attempts, whereas those who used more severe methods of self-injury reported 7.6% of the suicidal attempt (Calvete et al., 2015). In this sense, it is important to have adequate measuring instruments to evaluate self-injury behaviors (Díez-Gómez et al., 2020).

The lack of knowledge and data disparity about NSSI is largely determined by the availability of assessment tools (Faura-Garcia, et al., 2021a). Among the instruments validated in Spanish samples we find the Functional Assessment of Self-Mutilation (FASM) validated with community adolescents and young adults (Calvete et al., 2015), the Inventory of Statements About Self-Injury (ISAS) validated with adolescents and young people adults (Pérez et al., 2021), and the Self-Injurious Thoughts and Behaviors Interview (SITBI), validated in clinical settings (García-Nieto et al., 2013, 2015). The lack of knowledge and disparity of data on NSSI in Spanish community adolescents could be favored through the measurement instruments in this population.

The Self-Injurious Thoughts and Behaviors Interview (SITBI; Nock et al., 2007) is one of the instruments with the most indicators for NSSI (Faura-Garcia, Orue et al., 2021b). SITBI was validated in Spanish adults hospitalized in psychiatry (García-Nieto et al., 2013) and used in Spanish outpatient adolescents (García-Nieto et al., 2015). This interview assesses self-injurious behaviors, suicidal behavior (ideation, plan, gesture and attempt) and NSSI. It also assesses NSSI thoughts and behavior independently, in relation to its presence, frequency, methodology, age of onset, functions, precipitants, severity, drug use, treatment, social influences, and future NSSI. It has shown adequate psychometric properties in Spanish, English, German, and Italian (D'Agostino et al., 2018; Fischer et al., 2014; García-Nieto et al., 2013; Nock et al., 2007). Compared with self-report questionnaires for NSSI validated in Spain (Faura-Garcia, Calvete, et al., 2021a), and especially those focused on NSSI functions (FASM, Calvete et al., 2015; ISAS, Pérez et al., 2020), SITBI offers the same indicators on NSSI and adds new ones, including NSSI thoughts assessment.

Nonetheless, its interview format and length (169 items) can make evaluation difficult in community adolescents. As NSSI is often stigmatizing and concealed (Rowe et al., 2014), a self-administered format that allows anonymity could lead to more reliable reports (Faura-Garcia, Calvete, et al., 2021b). A revised version of the SITBI in online format showed strong test-retest reliability and convergent validity compared to suicidal behavior measures (Fox et al., 2020). Anonymity and adolescents' ability as digital natives reduce biases, administration time, and interviewers. Moved by this idea, D'Agostino et al. (2018) adapted and validated the NSSI thoughts and behavior scales of the SITBI in a self-reported version in a clinical sample of adults, with excellent internal consistency, and validity evidences. This reduced version showed validity evidences, correlating with constructs related to NSSI (depression, hopelessness, borderline personality disorder, post-traumatic stress disorder) and another measure of NSSI (Deliberate Self-Harm Inventory; Gratz, 2001).

The main purpose of this study was to determine NSSI thoughts and NSSI behavior features in Spanish community adolescents through a self-administered version with an electronic device and short form the SITBI (Self-Injury Thoughts and Behaviors Interview - Non-Suicidal Self-Injury, SITBI-NSSI). For this exploratory purpose, descriptive statistics and sex differences of the SITBI-NSSI in relation to the scale of thoughts and behaviors were analyzed. The association between various indicators of NSSI and suicidal behavior (ideation, desire, planning, and attempt) was also examined. We hypothesized that the indicators would be similar to those found in international studies. Specifically, the prevalence of NSSI, age of onset, methodology and functions were expected to be similar to international and national ones, as well as the association between NSSI and suicidal behavior. Secondarily, for its preliminary validation, we analyzed associations with measures of constructs related to NSSI and indicators obtained with homologous measurement instruments, hypothesizing significant associations.

Method

Participants

Although the sampling was non-probabilistic, we tried to obtain the participation of schools with broad socioeconomic representation. The final sample consisted of 685 adolescents aged between 13 and 18 (M = 15.58, SD = 1.08). Of them, 417 were girls (60.9%) and 268 boys. Those with intellectual disabilities, students with special needs for educational support or low knowledge of Spanish were excluded. The adolescents came from eight high schools (39.6% public; 60.4% private) in the Basque Country (Spain; urban setting) and were in 10th grade (38.4%), 11th grade (36.9%), 12th grade (7.2%), and 13th grade (17.5%). The socio-economic level was established through the occupation and parental education reported by the participants: 24.2% low, 18.5% medium-low, 34.3% medium, 16.3% medium-high, and 6.7% high.

Procedure

The ethics committee of the University of [MASKED] approved the research design (Ref.: ETK-22/18-19). Eighty-six secondary and/or high school institutes were contacted, of which eight agreed to participate (acceptance rate = 26%). Confidentiality and anonymity of the participants were guaranteed by assigning confidential codes, and the signed informed consent was obtained from parents and adolescents (participation ratio = 92.86%). The researchers collected the measurements in situ via computers or smartphones during regular classes between October 2019 and January 2021. The questionnaires were answered and automated by Qualtrics software (Supplementary material).

Instruments

The SITBI-NSSI assesses NSSI thoughts and behavior (Supplementary Material 1). The self-administered electronic version was modified from the SITBI (Nock et al., 2007). SITBI measures self-injurious behavior through an interview. It has shown adequate psychometric properties in numerous studies in different countries and is one of the measures that evaluates the most indicators on NSSI (Faura-Garcia et al., 2021a). We use the NSSI modules of the full version of the SITBI translated in a Spanish clinical sample with adequate psychometric properties (García-Nieto et al., 2013; 2015).

The NSSI thought and NSSI behavior modules were inserted into the Qualtrics questionnaire software without modifications or translations from García-Nieto et al. (2013). version. If the first question of each module is answered "no" (Have you ever thought about hurting yourself / have you hurt yourself without intending to die?), the module is automatically terminated.

The SITBI-NSSI measures NSSI through 31 items divided into two modules: thoughts (15 items) and behavior (16 items). Both modules evaluate the same characteristics concerning: presence *(yes-no)*, age of onset, age at the last episode, frequency (number of life episodes, of the last year, month, and week), medical treatment of NSSI *(yes-no)*, 7 methods (*yes-no*; behavior scale only), medium intensity and worst moment, 4 functions (APR, ANR, SPR, and SNR), and 6 inter and intrapersonal precipitants (0-*none* to 4-*totally*), % of time taking drugs/alcohol during NSSI, time before engaging in NSSI (scale: 0 seconds, 1-60 seconds, 2-15 minutes, 16-60 minutes, less than a day, 1-2 days, more than 2 days, long periods), number of friends with NSSI and their influence (scale 0-*none* to 4-*totally*) before and after the first time, and probability of future occurrence (scale 0-*none* to 4 -*totally*).

The Functional Assessment of the Self-Mutilation scale (FASM; Lloyd et al., 1997) was used to assess NSSI functions. This scale measures 22 reasons for self-injury, scoring them from 0 (never) to 3 (many times). The Spanish version showed good psychometric properties in community adolescents, revealing a factorial structure of four functions (Calvete et al., 2015): ANR, APR, SNR, and SPR, which can be grouped into automatic (ANR and ARP) and social (SNR and SPR) functions. In this sample, Cronbach's alpha coefficient was .83 for ANR, .75 for ARP, .66 for SNR, and .84 for SPR, while for the automatic and social functions, it was .89 and .66, respectively.

Different dichotomous items were used to evaluate suicidal behavior. To measure thoughts, the item, *"Have you ever thought about ending your life?"* from the Spanish version of the SITBI (García-Nieto et al., 2013) was used and for previous attempts the item, *"Have you ever attempted to end your life in which you had the intention to die?"*. Suicidal desire (*Have you ever wished you were dead or could fall asleep and never wake up again?*) and plans (*Have you ever thought about how you could end your life or plan to do so?*) were evaluated through the Spanish version of the C-SRSS (Al-Halabí et al., 2016).

Data Analysis

Statistical analyses were performed with SPSS 25. The frequency and basic characteristics of the sample were examined using descriptive statistics. Differences in means and frequencies were evaluated, respectively, by t-tests and chi-square tests. The effect size was analyzed and interpreted using Cohen's d (Jacob Cohen, 2013). The relationship between the target variables was examined through Pearson's correlation and the Phi coefficient. The role of dichotomous variables was estimated using relative risk indices. There were no outliers. The percentage of missing values was 0.1% for SITBI-NSSI Behavior and SITBI-NSSI Thoughts, 1.6% for suicidal ideation, 0.9% suicidal attempt and suicidal desire, 1.9% for suicidal plan, and 2.6% for NSSI functions (FASM). Analyzes were carried out through pairwise deletion.

Results

Descriptive Statistics and Sex Differences for SITBI-NSSI

The frequencies, means, standard deviations, and sex differences for SITBI-NSSI are presented in Table 1. Girls were 1.32 times (95% CI [1.17-1.49]) more likely than boys to present NSSI thoughts and 1.23 (95% CI [1.08-1.40]) times more likely to present NSSI behavior. Those who ever thought of NSSI did so on average 12.12 times in their life (SD = 22.27) and those who self-injured did it on average 6.05 times (SD = 6.57) in their life. Girls thought about NSSI more times than boys in the past year, month, and throughout their lives.

Table 1.
Frequencies, Means, Standard Deviations And Sex Differences For SITBI-NSSI Scales.

	NSSI Thoughts									NSSI Behavior								
	Total Sample		Female		Male		χ^2	*p*	*V*	Total Sample		Female		Male		χ^2	*p*	*V*
	n	%	n	%	n	%				n	%	n	%	n	%			
Presence																		
Lifetime	136	19.9	103	24.7	33	12.4	15.56	>.001	.15	115	16.8	83	19.9	32	12	7.30	.007	.10
Past year	96	14	74	17.7	72	8.2	12.31	>.001	.13	70	10.2	51	12.2	19	7.1	4.70	.030	.08
Past month	57	8.3	45	10.8	12	4.5	8.53	.004	.11	34	5	23	5.5	11	4.1	.70	.407	.03
Past week	42	6.1	35	8.4	7	2.6	9.48	.002	.12	25	3.6	17	4.1	8	3	.55	.457	.03
Medical treatment	—	—	—	—	—	—	—	—	—	17	6.50	12	6.9	5	5.7	.15	.698	.03
Methods (sorted by frequency)																		
Bit (e.g., lip)	—	—	—	—	—	—	—	—	—	154	22.48	111	26.6	43	16	10.47	.001	.12
Hit	—	—	—	—	—	—	—	—	—	132	19.27	81	19.4	51	19	.02	.898	.01
Scratch	—	—	—	—	—	—	—	—	—	81	11.82	59	14.1	22	8.2	5.52	.019	.09
Cut	—	—	—	—	—	—	—	—	—	73	10.66	51	12.2	22	8.2	2.77	.096	.06
Pick at a wound	—	—	—	—	—	—	—	—	—	69	10.07	44	10.6	25	9.3	.27	.604	.02
Pinch skin to the point of drawing blood	—	—	—	—	—	—	—	—	—	36	5.26	26	6.2	10	3.7	2.05	.152	.06
Other	—	—	—	—	—	—	—	—	—	32	4.67	21	5	11	4.1	.32	.573	.02
Pull hair out	—	—	—	—	—	—	—	—	—	30	4.38	22	5.3	8	3	2.04	.153	.06
“Erased” skin to the point of drawing blood	—	—	—	—	—	—	—	—	—	20	2.92	15	3.6	5	1.9	1.73	.189	.05
Burned the skin (e.g. with a cigarette, match or other hot object)	—	—	—	—	—	—	—	—	—	16	2.34	10	2.4	6	2.2	.02	.893	.01
Insert objects under nails or skin	—	—	—	—	—	—	—	—	—	12	1.75	6	1.4	6	2.2	.61	.436	.03
Gave yourself a tattoo	—	—	—	—	—	—	—	—	—	6	.88	4	1	2	.7	.09	.770	.01
	Total Sample		Female		Male		*t*	*p*	*d*	Total Sample		Female		Male		*t*	*p*	*d*
	M	*SD*	*M*	*SD*	*M*	*SD*				*M*	*SD*	*M*	*SD*	*M*	*SD*			
Frequency																		
Lifetime	12.12	22.27	14.51	24.89	4.81	7.24	2.17	.032	.44	6.05	6.57	6.29	6.78	5.45	6.07	.60	.549	.13
Past year	6.44	17.05	7.90	19.36	1.94	2.32	3.44	.001	.35	2.57	5.87	2.91	6.73	1.70	2.51	.96	.342	.21
Past month	1.71	3.80	2.02	4.26	.73	1.31	2.57	.011	.34	1.07	3.12	1.15	3.56	.85	1.43	.43	.671	.10
Past week	1.05	2.75	1.23	3.05	.45	1.33	1.35	.180	.29	.66	2.46	.75	2.83	.43	.88	.58	.561	.13
Average age of onset	12.77	2.34	12.83	2.17	12.56	2.83	.56	.575	.11	12.74	2.57	12.69	2.56	12.87	2.62	-.32	.751	-.07
Age of last time	14.42	1.92	14.51	1.40	14.16	2.99	.86	.389	.18	14.46	1.36	14.44	1.29	14.52	1.57	-.25	.803	-.05
Severity (worst point)a	2.70	1.25	2.77	1.23	2.47	1.28	1.19	.236	.25	—	—	—	—	—	—	—	—	—
Severity (average)a	2.21	1.25	2.27	1.26	2.00	1.23	1.05	.294	.22	—	—	—	—	—	—	—	—	—

Table 1.
Frequencies, Means, Standard Deviations And Sex Differences For SITBI-NSSI Scales (Continuation).

Functionsa																		
Automatic negative reinforcement	2.06	1.25	2.19	1.16	1.65	1.43	2.16	.033	.44	1.52	1.48	1.65	1.51	1.28	1.41	1.91	.058	.25
Automatic positive reinforcement	1.96	1.42	2.13	1.44	1.42	1.23	2.48	.015	.51	.92	1.24	1.07	1.32	.63	1.02	2.70	.008	.36
Social negative reinforcement	1.02	1.29	1.01	1.30	1.06	1.29	-.21	.838	-.04	.42	.87	.44	.89	.36	.84	.72	.470	.10
Social positive reinforcement	1.49	1.34	1.65	1.37	.97	1.08	2.90	.005	.52	.67	1.13	.68	1.08	.65	1.23	.18	.854	.02
Precipitantsa																		
Family	1.73	1.49	1.89	1.43	1.23	1.59	2.21	.029	.45	1.02	1.39	1.08	1.46	.88	1.24	1.09	.278	.14
Friends	1.38	1.34	1.55	1.28	.84	1.42	2.63	.010	.54	.69	1.11	.74	1.14	.58	1.07	1.05	.294	.14
Relationship	.65	1.21	.69	1.22	.52	1.21	.70	.488	.14	.34	.86	.33	.79	.38	.98	-.43	.668	-.06
Peers	1.08	1.32	1.06	1.28	1.13	1.45	-.25	.800	-.05	.54	1.04	.61	1.07	.41	.97	1.42	.157	.19
School/work	1.37	1.34	1.35	1.28	1.43	1.55	-.31	.757	-.06	.81	1.22	.78	1.13	.88	1.38	-.65	.517	-.09
Mental state	2.35	1.36	2.50	1.29	1.88	1.45	2.33	.021	.47	1.30	1.54	1.43	1.58	1.05	1.41	1.86	.064	.25
Characteristics																		
Alcohol/drugs (% of time)	16.05	26.42	17.24	26.75	11.71	25.26	.91	.366	.21	10.44	23.00	10.82	22.28	9.67	24.56	.32	0751	.05
No. peers with behavior before 1st time	2.29	8.92	2.53	10.19	1.52	1.79	.55	.583	.11	1.32	2.28	1.38	2.16	1.20	2.50	.58	0565	.08
No. peers with behavior after 1st time	1.73	2.43	1.83	2.58	1.39	1.81	.83	.408	.18	1.14	2.03	1.29	2.18	.85	1.71	1.51	.133	.22
Peer influence before 1st timea	.65	1.15	.60	1.12	.79	1.24	-.79	.431	-.17	.33	.89	.33	.91	.33	.84	.01	.988	.00
Peer influence after 1st timea	.92	1.24	.89	1.26	1.00	1.20	-.40	.691	-.08	.38	.84	.44	.92	.28	.67	1.43	.155	.19
Future likelihood of this behaviora	1.52	1.31	1.60	1.36	1.25	1.42	1.25	.162	.27	.78	1.13	.84	1.20	.67	.98	1.09	.277	.15

Notes. a Scale of 0 (“none”) to 4 (“totally”).
NSSI = Nonsuicidal Self-Injury; — = Not applicable.
*p < 0.05 **p < 0.01 (bilateral).

The mean age of NSSI onset was similar (13 years) in behavior and thoughts. Concerning treatment, 6.5% of the adolescents received medical treatment for the injuries they caused. The most frequent self-injurious methodologies were biting, hitting, scratching, cutting, and picking at a wound. Girls reported biting and scratching more than boys and the difference was statistically significant. Among those who self-injured, the mean number of methods was 3.15 (*SD* = 2.08), with the girls using more methods (*M* = 3.46, *SD* = 1.99 vs. *M* = 2.34, *SD* = 2.13; *t*(113) = 2.56, *p* = .014, Cohen's *d* = 0.55).

ANR was the function with the highest intensity for NSSI thoughts and behavior, and it was significantly higher in girls. The second most reported function was APR, which was significantly higher in girls presenting NSSI behavior. Among those who self-injured at some time, the mean number of functions for thoughts (*M* = 2.31, *SD* = 1.45) and behavior (*M* = 2.15, *SD* = 1.17) was similar, and higher in girls (*M* = 2.54, *SD* = 1.32 vs. *M* = 1.72, *SD* = 1.61; *t*(113) = 2.58, *p* = .013, Cohen's *d* = 0.59). The main precipitating factors for thoughts and behavior were the state of mind at the time, problems with family, friends, and studies. NSSI thought precipitants were mental status, problems with family, and problems with friends and they were statistically higher in girls than in boys.

Concerning substance consumption, 41.4% of adolescents with NSSI thoughts took drugs/alcohol while engaging in NSSI, whereas 38.3% of those with NSSI sometimes took drugs/alcohol during self-injury. Adolescents reported having few friends with NSSI thoughts or behavior before or after their first NSSI thought or behavior (*M* = 1.29 - 2.29, *SD* = 2.03 - 8.92). They also stated that their friends' behavior had almost no influence before or after their first NSSI thought or behavior. although the influence was greater on thoughts. The reported probability of NSSI thoughts in the future was higher (*M* = 1.52, *SD* = 1.31, scale 0-*none* to 4-*totally*) than that of performing NSSI in the future (*M* = 0.78, *SD* = 1.13).

The frequencies, means, and standard deviations of measures of suicidal behavior (ideation, attempt, plan, and desire), number of methods and NSSI functions, as well as differences by sex are shown in Table 2. The girls reported more thoughts about ending with their life, wishing to die, self-injurious methods, and functions reported with the FASM.

Validity

We examined the validity by testing the correspondence between the SITBI-NSSI responses to the items on functions and the responses to the analogous items of the FASM. We correlated the dimensions of the FASM (Calvete et al., 2015) with the analogous items of the SITBI-NSSI (Table 3). The correlations between functions were all statistically significant, between .17 and .75 except for ARP x FASM and SNR x SITBI-NSSI. The number of reasons for self-injury reported in both measures shows a large positive and statistically significant correlation (*r* = .75, *p* <.001). On another hand, the number of reasons for self-injury reported in the FASM had positive, moderate, and statistically significant correlations with the SITBI-NSSI Behavior functions (*r* = .43 - .65).

Table 2.
Frequencies, Means, Standard Deviations And Sex Differences for Suicide, NSSI Methods and Functions.

	Total Sample		Female		Male		χ^2	*p*	*V*
	n	%	n	%	n	%			
Suicide ideation (SITBI)	192	28.5	129	31.5	63	23.9	4.55	.033	.08
Suicide attempt (SITBI)	43	6.3	30	7.2	13	4.9	1.45	.229	.05
Suicide plan (C-SRSS)	187	27.8	117	28.7	70	26.4	.44	.510	.03
Suicide desire (C-SRSS)	264	38.9	193	46.5	71	26.9	26.12	<.001	.20
	Total Sample		**Female**		**Male**		***t***	***p***	***d***
	M	***SD***	***M***	***SD***	***M***	***SD***			
No. NSSI methods (SITBI-NSSI)	.97	1.68	1.08	1.71	.79	1.61	2.23	.024	.18
No. NSSI functions (FASM)	3.20	5.96	3.60	6.44	2.60	5.10	2.19	.029	.17

Notes. NSSI = Nonsuicidal Self-Injury; SITBI = Self-Injurious Thoughts and Behaviors Interview; C-SRSS = Columbia Suicide Severity Rating Scale; FASM = Functional Assessment of Self-Mutilation.

Table 3.
NSSI SITBI and FASM Functions Correlations.

	SITBI-NSSI Behavior					
	ANR	APR	SNR	SPR	AR	SR
FASM ANR	.63**	.68**	.18**	.47**	.75**	.42**
FASM APR	.57**	.54**	.12	.40**	.64**	.35**
FASM SNR	.31**	.29**	.20**	.51**	.34**	.474**
FASM SPR	.37**	.24**	.57**	.33**	.35**	.56**
FASM AR	.64**	.66**	.17**	.47**	.75**	.42**
FASM SR	.41**	.32**	.43**	.51**	.42**	.61**
n	257	253	255	251	258	255
M	1.52	.92	.42	.67	1.22	.54
SD	1.48	1.24	.87	1.13	1.20	.78

Notes. NSSI = Nonsuicidal Self-Injury; SITBI = Self-Injurious Thoughts and Behaviors Interview; FASM = Functional Assessment of Self-Mutilation; ANR = Automatic Negative Reinforcement; APR = Automatic Positive Reinforcement; SNR = Social Negative Reinforcement; SPR = Social Positive Reinforcement; AR = Automatic Reinforcement; SR = Social Reinforcement; α = Cronbach's alpha; — = Not applicable.
*p < 0.05 **p < 0.01 (bilateral).

Those who thought about NSSI were 3.07 times more likely (95% CI [2.48, 3.80]) to think about suicide than those who had not thought about NSSI (41.1% vs. 9.5%; $\chi^2(1, N = 674) = 90.75$, $p < .001$), 9 times more likely (95% CI [4.90, 16.54]) to attempt suicide (67.4% vs. 15.4%; $\chi^2(1, N = 679) = 71.72$, $p < .001$), 3.09 times more likely (95% CI [2.49, 3.84]) to plan suicide (41.2% vs. 9.7%; $\chi^2(1, N = 672) = 88.92$, $p < .001$) and 2.72 times more likely (95% CI [2.33, 3.18]) to want to commit suicide (38.3% vs. 6%; $\chi^2(1, N = 679) = 110.93$, $p < .001$). Those who self-injured were 2.87 times more likely (95% CI [2.32, 3.55]) to have suicidal thoughts (34.4% vs. 7.9%; $\chi^2(1, N = 674) = 73.84$, $p < .001$) than those who did not self-injure, 7.59 times more likely (95% CI [4.30, 13.41]) to have attempted suicide (58.1% vs. 12.6%; $\chi^2(1, N = 679) = 63.96$, $p < .001$), 2.84 times more likely (95% CI [2.29, 3.53]) to plan suicide (34.2% vs. 8.2%; $\chi^2(1, N = 672) = 69.62$, $p < .001$), and 2.49 times more likely (95% CI [2.13, 2.91]) to want to commit suicide (31.1% vs. 5.3%; $\chi^2(1, N = 679) = 82.55$, $p < .001$). Those who presented suicidal behavior had more NSSI thoughts, a higher probability of future NSSI episodes and thoughts, a stronger intensity of NSSI thoughts, a higher number of methods, and higher scores on functions (Supplementary Table S1).

The life presence of NSSI behavior obtained in the SITBI-NSSI correlated moderately with the presence of self-injury according to FASM ($r_{\varphi} = .52$, $p < .001$; $\chi^2(1, N = 410) = 180.754$, $p < .001$). The correlation between the intensity of the SITBI-NSSI behavior functions and the intensity of the functions according to FASM was high ($r = .75$, $p < .001$).

Discussion

Despite recent studies on demographic and psychometric characteristics of instruments for NSSI, there is a lack of knowledge about the Spanish adolescent community population. This study has explored this population's demographic characteristics associated with NSSI thoughts and behavior through the preliminary validation of the SITBI-NSSI, a new brief self-administered electronic version of the SITBI.

NSSI and Suicide Features

One in five adolescents thought about NSSI sometime in life and one in six had self-injured. Proportionally, more girls had self-injured throughout their lives, in the last year, month, and week. The results coincide with some studies with a similar Spanish population (Bousoño et al., 2021; Brunner et al., 2014; Calvete et al., 2015) and from other countries (Bresin & Schoenleber, 2015), but not with other studies also with a similar population (Bousoño et al., 2021; Faura-Garcia, Orue, et al., 2021a; Kirchner et al., 2011; Pérez et al., 2021) or from other countries (Swannell et al., 2014). The presence of NSSI thoughts was higher in girls than in boys both throughout life and in the last year, month, and week. The prevalence of NSSI behavior is similar to that reported in a similar population (Pérez et al., 2021) and to the mean of several countries (17%), despite the wide range of prevalences (1.5% - 54.8%; Brunner et al., 2014; Swannell et al., 2014) but they differ from studies with a similar Spanish population (Bousoño et al., 2021; Calvete et al., 2015, 2017; Faura-Garcia, Orue, et al., 2021a; Kirchner et al., 2011). The mean age of onset of NSSI is close to that found in other countries (13-16 years, Gandhi et al., 2018; Muehlenkamp et al., 2019), and is somewhat higher than that reported in the equivalent population (10 years; Calvete et al., 2015).

Consistent with previous research, 6.5% of adolescents had received medical treatment for the injuries they caused (0.21 - 6.3%; Bousoño et al., 2021; Brunner et al., 2014; Calvete et al., 2015; Hawton et al., 2004). The simultaneous reports of having received treatment and also not having NNSI thoughts (1.5%) or performed NSSI (1.9%) suggest that the conceptualization of self-injury may differ and encompass NSSI in addition to other behaviors, such as suicidal behavior. This argument supports the conceptual difference between NSSI and suicidal self-injury.

The most-reported method of NSSI was biting, coinciding with Spanish community adolescents and youth (Calvete et al., 2015), although the frequency of the methods differs (Calvete et al., 2015; Pérez et al., 2021). At other ages and in other countries, the most frequent methods were those described in Spain as being more serious (Calvete et al., 2015): cutting and burning, followed by hitting and different ways of damaging the skin (Brunner et al., 2014; Swannell et al., 2014; Victor et al., 2018). The NSSI conceptualization may depend on the cultural context and country. For example, in a study with a similar sample, more than half self-injured mostly through bites (Calvete et al., 2015). Girls bit and scratched themselves more than boys, in line with results from a similar population (Calvete et al., 2015) and from other countries (Bresin & Schoenleber, 2015; Brunner et al., 2014), without other sex differences in the methodology, contrasting with other studies (Brunner et al., 2014; Victor et al., 2018). Those who self-injured at some time used three methods on average, coinciding with a similar population (Calvete et al., 2015), but to a lesser extent than the average of different countries (Swannell et al., 2014).

The most frequent functions for NSSI thoughts and behavior were automatics, specifically negative reinforcement; which was higher in girls. These results coincide with the commonly reported functions for NSSI behavior (Nock et al., 2009) and with those found in a similar population (Bousoño et al., 2021; Calvete et al., 2015; Pérez et al., 2021).

Consistent with previous research, four out of ten adolescents took drugs/alcohol while thinking about or performing NSSI (41.2–56.8%; Brunner et al., 2014). Drug/alcohol use occurred in a smaller percentage of the time while thinking about (16%) or engaging in NSSI (10%), coinciding with the results of a similar sample (Calvete et al., 2015). On another hand, the adolescents had on average one or two friends with NSSI before or after their first NSSI thought or behavior. However, they reported that their friends had almost no influence on thoughts about self-injury or self-injury.

About four in ten adolescents wanted to die sometime in life, a third thought about suicide, another third planned to commit suicide, and 6% had attempted suicide. The girls thought about and wanted to commit suicide more than the boys. The percentage of suicide attempts coincides with other studies (Calvete et al., 2015; Fonseca-Pedrero et al., 2018), whereas suicidal ideation is higher (Kirchner et al., 2011).

As reported in previous studies, NSSI and suicidal behavior appear to be related (Brunner et al., 2014; Groschwitz et al., 2015; Victor & Klonsky, 2014). Individuals with NSSI were 8-9 times more likely to have attempted suicide and 3 times more likely to have thought about, planned, and wished to commit suicide. Adolescents with suicidal behavior generally presented more NSSI, a higher number of methods and functions, a higher mean intensity, and they believed they were more likely to have them in the future.

Such results are in line with those reported in a similar population (Kirchner et al., 2011) and in reviews but seem somewhat greater (e.g., suicide attempt; Castellví et al., 2017; Kiekens et al., 2018). The relationship found in the present study between NSSI thoughts and suicidal behavior closely resembles that found between NSSI behavior and suicidal behavior. It may be because NSSI behavior occurs at the same time as NSSI thoughts; among those who thought about self-injuring themselves, 74% actually did so.

SITBI-NSSI Preliminary Validation

Regarding the SITBI-NSSI preliminary validation, the correlations of the SITBI-NSSI and FASM functions were positive, with a low-high range. The number of functions of the two instruments correlated moderately. In addition, we tested criterion validity by correlating SITBI-NSSI with measures of NSSI-related constructs. The correlation with FASM of the life presence of NSSI behavior was positive and moderate, while the intensity of the functions was positive and high.

Strengths and Limitations

This study has some limitations. This is an exploratory study, the low standardization of other NSSI measures in the study population does not allow a broader comparison, and the validation evidence is preliminary. The different conceptualizations of self-injury and the methodological differences favor the discrepancies between studies, especially regarding the prevalence and gender differences (Faura-Garcia, Calvete, et al., 2021). The SITBI-NSSI could be expected to estimate a higher prevalence due to some of its characteristics (checklist, a large number of methods, self-administered format, anonymity, and focusing the concept on NSSI; Morales et al., 2018; Swannell et al., 2014). However, the obtained prevalence is lower (Calvete et al., 2015, 2017) and many indicators are similar to those reported in meta-analyses and reviews. Despite this, this is the first study to examine such a large number of indicators together with NSSI thoughts and suicidal behavior in Spanish community adolescents.

A more complete validation would include data on SITBI-NSSI reliability. No factorial or internal consistency analyses were performed according to the suggestion of the creators of the questionnaire (Nock et al., 2007) because the majority of the variables were measured by only one indicator. Future research should examine test-retest reliability with successive administrations. Moreover, the comparison between administration in an interview format and electronic self-administration would provide more information on its reliability. However, Fox et al. (2020) found a low equivalence between the online format and the interview format of a version of the instrument from which SITBI-NSSI was adapted.

Test-retest reliability could be analyzed with successive administrations. Likewise, the comparison between administration in an interview format (e.g., interjudge reliability) and electronic self-administration would provide more information on its reliability. However, Fox et al. (2020) found a low equivalence between the online format and the interview format of a version of the instrument from which SITBI-NSSI was adapted. Hence, we propose the comparison of the two formats with other explicit (e.g., tutors) and non-explicit (e.g., Ecological Momentary Assessment; EMA) sources of information.

Social functions and the influence of friends may have been underreported because they were rejected by the participants (Nock et al., 2009), especially in adolescence when individualization becomes more central. In addition, those who self-injure may have difficulties in recognizing the relationship between NSSI, their attemptionality or the changes generated in their social environment (Rodríguez-Blanco et al., 2018). A non-explicit evaluation (e.g., EMA) could clarify the validity evidence of our results.

These results could have important implications for community prevention and clinical practice. The SITBI-NSSI's extensive evaluation, added to the advantages of electronic self-administration, can enhance evaluation in community and clinical settings for intervention and research. SITBI-NSSI could be used in the screening and evaluation of community mental health prevention programs, as suggested in the emerging NSSI prevention programs (Al-Halabí & Fonseca-Pedrero, 2021; Lewis et al., 2019; Muehlenkamp et al., 2010). In addition, the evaluation of both behavior and thought NSSI, would support the intervention of psychological interventions with greater efficacy for NSSI that usually work the NSSI thoughts, functions, methods and precipitants (Calvo et al., 2022; Fox, Huang, et al., 2020; Mollà et al., 2015).

NSSI thoughts are relevant here, given their intense relationship with suicidal behavior, NSSI, and alcohol consumption. Their evaluation would create a preventive window because NSSI thoughts can precede self-injury (Rodríguez-Blanco et al., 2018). This will make it possible to refine the prognosis, diagnosis, and interventions in community and clinical settings.

In summary, the results presented in this study allow us to know a multitude of indicators for NSSI thoughts, as well as for NSSI behavior, in Spanish community adolescents. A high vital prevalence of NSSI has been found, in turn related to high suicidal behavior. Some NSSI feautres differed by sex. Through the preliminary validation of SITBI-NSSI in Spanish community adolescents, in addition, a high association between NSSI (thoughts and behavior) and suicidal behavior (ideation, attempt, plan and desire) is found. Such findings allow a simpler future evaluation, as well as a better understanding of the NSSI in Spanish community adolescents and regarding suicidal behavior. These results can be used to improve prevention and intervention programs for NSSI and suicide, because knowing the relationship between non-suicidal and suicidal behavior, it is possible to refine the prognosis, diagnosis and intervene in a community and clinical direction.

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Conflicts of interest

The authors declare that they have no competing interests. No interest or financial benefit has arisen from the direct applications of this investigation.

Availability of data and material

Data available in https://osf.io/qm64r/

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Annexe

Table S1.
Means, Standard Deviations And Suicide Differences for NSSI.

	Suicide ideation							Suicide attempt						
	Yes		No		*t*	*p*	*d*	Yes		No		*t*	*p*	*d*
	M	*SD*	*M*	*SD*				*M*	*SD*	*M*	*SD*			
Thought NSSI														
No. lifetime	17.56	26.85	3.46	4.26	-3.61	< .001	-0.66	29.03	36.55	7.27	12.61	-5.06	< .001	-1.07
Intensity average	3.11	1.08	2.08	1.21	-5.03	< .001	-0.91	3.26	1.18	2.55	1.22	-2.85	.005	-0.59
Probability in the future	1.92	1.35	.71	.77	-5.36	< .001	-1.02	2.10	1.45	1.34	1.21	-2.82	.006	-0.60
Behavior NSSI														
No. lifetime	6.62	6.83	5.10	6.17	-1.16	.248	-0.23	8.40	8.38	5.37	5.83	-2.06	.042	-0.47
Probability in the future	1.26	1.32	.35	.71	-6.72	< .001	-.87	1.53	1.50	.65	1.01	-4.44	< .001	-.80
No. methods	1.96	2.20	.56	1.20	-10.56	< .001	-0.90	3.09	2.56	.83	1.50	-9.05	< .001	-1.43
Intensity functions	6.45	7.30	1.78	4.35	-10.10	< .001	-0.87	11.91	9.13	2.62	5.19	-10.65	< .001	-1.68

Table S1.
Means, Standard Deviations And Suicide Differences for NSSI (Continuation).

	Suicidal plan							Suicidal desire						
	Yes		No		*t*	*p*	*d*	Yes		No		*t*	*p*	*d*
	M	*SD*	*M*	*SD*				*M*	*SD*	*M*	*SD*			
Thought NSSI														
No. lifetime	16.49	27.14	5.78	8.55	-2.68	.008	-0.49	14.64	24.54	3.00	2.65	-2.45	.015	-0.53
Intensity average	2.95	1.19	2.38	1.24	-2.61	.010	-0.47	2.92	1.19	1.93	1.15	-3.93	< .001	-0.84
Probability in the future	1.80	1.39	1.02	1.02	-3.30	.001	-0.62	1.75	1.30	.58	.88	-4.17	< .001	-0.95
Behavior NSSI														
No. lifetime	6.42	6.95	5.50	6.06	-.71	.483	-0.14	6.09	6.81	5.54	5.65	-.36	.717	-0.08
Probability in the future	1.15	1.34	.49	.83	-4.62	< .001	-.61	1.08	1.25	.30	.66	-5.53	< .001	-.73
No. methods	1.88	2.26	.61	1.23	-9.34	< .001	-0.80	1.75	2.09	.47	1.09	-10.46	< .001	-0.82
Intensity functions	6.41	6.95	1.89	4.70	-9.55	< .001	-0.83	5.69	7.19	1.58	4.32	-9.18	< .001	-0.73

Notes. NSSI = Nonsuicidal Self-Injury.