

ASSY-I Screening: A Suicidality Scale for Argentinean Young Students

ASSY-I Screening: Una Escala de Suicidalidad para Jóvenes Argentinos Escolarizados

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This study aimed at deepening into the internal structure's analysis of the Argentinean Scale of Suicidality, Youth version—ASSY-I Screening—. The 6-factor model obtained in a previous exploratory factor study was tested via confirmatory factor analysis, and further compared with an alternative second-order model. The factorial invariance was examined using the self-perceived gender as a splitting variable. The factors' internal consistency was analysed in the whole sample and in two subsamples comprising exclusively men and women. The scores' stability-reliability was examined using a test-retest analysis. The sample was composed of 632 students with ages between 13 and 21 years old ($M = 17.88$, $SD = 2.16$; 64.08% women, 35.92% men). Results showed evidence favouring the robustness of the ASSY-I model as well as the likelihood of generalising it across groups in the local population of young students. Findings are discussed regarding further uses of the scale in the professional field.

Keywords: suicide risk, screening scale, high-school students, college students, psychometric features

Este estudio se propuso profundizar el análisis de la estructura interna de la Escala Argentina de Suicidalidad para Adolescentes —ASSY-I Screening—. Para ello se testeó el modelo de 6 factores, resultante de un estudio exploratorio previo, mediante un análisis factorial confirmatorio, que se comparó con un modelo alternativo de segundo orden. Se analizó también la invarianza factorial del modelo según género autopercebido como variable de segmentación, además de la consistencia interna de las puntuaciones para la muestra total y para las submuestras de varones y mujeres. La estabilidad temporal de las puntuaciones se examinó por medio de un procedimiento de test-retest. Se trabajó con una muestra total de 632 adolescentes, con un rango de edad entre 13 y 21 años ($M = 17.88$; $DS = 2.16$; 64.08% mujeres, 35.92% varones). Los resultados aportan evidencias en favor de la robustez y la generalización a diferentes grupos del modelo factorial de ASSY-I, que avalan su aplicabilidad en jóvenes escolarizados de población local. Se discuten los resultados según perspectivas de aplicación en el campo profesional.

Palabras clave: riesgo suicida, escala de tamizaje, adolescentes escolarizados, estudiantes universitarios, psicometría

Suicide and suicidal behaviours have arisen as major health issues during the last four decades. Unfortunately, it is expected that this scenario will get even worse as a result of the SARS-COV-2 pandemic. Such a matter of concern involves young people between 15 and 29 years old, for whom suicide was the fourth cause of death worldwide in 2019 (World Health Organization [WHO], 2021). As for Argentina, suicide has

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been the second leading cause of death in the 15 to 24-year-old population since 2015, especially among young men, who commit suicide almost four times more than women (Dirección de Estadísticas e Información en Salud, 2021). Those epidemiological data highlight the urgency of developing scales meant to detect and estimate suicide risk in youths. Therefore, since the mid-20th century, suicidology aimed at the prediction of suicide risk in order to prevent attempts (e.g., Beck et al., 1974; Neuringer, 1961; Shneidman & Farberow, 1957).

Over the years, a large number of assessment tools has been developed, mainly in the United States (e.g., Goldston, 2000; Pianowski et al., 2015; Runeson et al., 2017). However, new scales were recently introduced, not only in Spain (e.g., Díez-Gómez et al., 2020), but also in Latin America (e.g., Bahamón Muñetón & Alarcón-Vázquez, 2018; Urzúa & Caqueo-Urizar, 2011). Despite these efforts, Runeson et al. (2017) and Hawton (2017) claimed that different studies had verified substantially low success when the suicidal prediction was the goal. Particularly, Hawton (2017) pointed out that such failure was partly due to the adoption of linear models which moved from a lower risk—ideation—to a higher risk—the imminent risk of an attempt.

Following that idea, Klonsky and May (2014; Klonsky et al., 2018) posited the reconsideration of the classical approach, which describes the linear progression from ideation to attempt: this new paradigm is currently known as ideation-to-action. Up to date, it meets four approaches: the interpersonal-psychological theory (IPTTS; Joiner, 2005), the fluid vulnerability model (Rudd, 2008), the integrated motivational-volitional theory (O'Connor, 2011), and the three-step theory (Klonsky & May, 2015). Even though such approaches entail differences regarding the importance of some dimensions over others, their core notion states that both suicide ideations and suicide attempts represent differentiated entities involving different predictive variables and different protective and risk factors (Khazem & Anestis, 2016; Klonsky et al., 2018). Such an essential feature of the ideation-to-action approaches gives them a special significance in the suicidology field, over more traditional theories, such as the cry of pain model, among others (Nock, 2014).

From the four models previously mentioned regarding the ideation-to-action paradigm, the IPTTS (Joiner, 2005) has drawn major attention and has produced the most important body of research (e.g., Joiner et al., 2009; King et al., 2019; Ma et al., 2016; Van Orden et al., 2010). Moreover, it has gathered promising evidence (Kleiman et al., 2014) in combination with notions that are central when estimating suicidal risk is the goal. Among these notions, hopelessness (Tucker et al., 2018), problem-solving mechanisms (Chu et al., 2018), and emotion regulation (e.g., Anestis et al., 2011) stand out as objects of clinical interest. The main hypotheses and concepts of the IPTTS are briefly described below.

The IPTTS model posits three main concepts which explain the occurrence of suicide ideations and suicide attempts: perceived burdensomeness, thwarted belongingness, and acquired capability for suicide. The burdensomeness involves the belief of being a burden to the loved ones as a result of being excessively flawed; it implies low self-esteem and, eventually, affectively laden cognitions of self-hatred. The thwarted belongingness dimension alludes to the unmet need for social connectedness, as well as to loneliness and the lack of reciprocal relationships of affection and support. The model states that when burdensomeness and thwarted belongingness emerge simultaneously, the idea of the own death emerges as something positive for others. This is how ideations and the desire for suicide arise.

Still, the process above is not enough to trigger a suicide attempt. At this point, the ideation-to-action model plays a key explanatory role. Suicide ideations themselves are insufficient to explain why, among all the individuals experiencing them, only a few make an actual attempt. Joiner et al. (2009) argue that such persons would gradually develop what is known as the capability for suicide, thus evolving from ideation to action by suppressing their survival instinct. Such capability entails a lower fear of death and an increased physical pain tolerance, and it is developed by repeated exposure to painful and provocative experiences (i.e., non-suicidal self-injury behaviours—NSSI—, long anorexic episodes, and abusive situations, among others). In sum, the theory claims that suicide attempts only take place when the three central concepts—perceived burdensomeness, thwarted belongingness, and acquired capability for suicide—occur simultaneously.

Such a new approach, ideation-to-action, involves important implications when assessing suicide risk. To begin with, it requires the distinction between two levels of risk assessment (King et al., 2013). The first one, named screening, examines whether suicide ideations are present, also considering protective and risk factors. When any risk is detected, a second-level assessment should be performed—diagnostic—, focused on identifying indicators of imminent risk—intent to die—. The most important indicators which should be

searched are specific suicidogenic experiences, such as planning, behaviours associated with the acquired capability for suicide (e.g., NSSI), and previous attempts performed either by the individual or any member of the family. To conduct a proper diagnostic, the combined use of interviews and standardised scales appears as the gold standard (e.g., American Psychiatric Association, 2003; Nock et al., 2008; Posner, 2016).

Argentina possesses very few scales properly developed or adapted according to the International Test Commission (ITC, 2017) standards. Local literature has scarcely published three psychometric studies on the matter, referred to the Inventory of Suicide Orientation ISO-30 (Fernández Liporace & Casullo, 2006; Galarza et al., 2019; King & Kowalchuk, 1994), the Multi-Attitude Suicide Tendency Scale (Casullo et al., 2006; Orbach et al., 1991), and the Attitudinal Beliefs Questionnaire Towards Suicidal Behavior (Desuque et al., 2011; Ruiz Hernández et al., 2005). The latter does not examine specifically suicide risk, but attitudes related to the moral dimension of suicide and the legitimation of it as a possible solution. Moreover, neither of the three scales includes any of the ideation-to-action models previously described.

To address such limitations, a new psychometric scale was developed: the Argentinean Scale of Suicidality-Youth version (ASSY) (Galarza, 2019; et al., 2021). It entails two assessment steps. The first part is a screening scale aimed at identifying at-risk cases who presumably are undergoing any suicidal process stage (ASSY-I). The second part is a complementary scale, meant to diagnose the intentionality of the suicidal act (ASSY-II). It should be used when the at-risk cut-off point has been reached at the screening stage. The second diagnostic step should be aimed not only at estimating the type and degree of risk, hence adding precision and specificity, but also at discriminating false-positive cases identified at the screening phase. International literature has not reported the development of scales including such two-step assessments as in ASSY-I and ASSY-II. Worthy of note, this study was entirely intended to report new developments conducted with the ASSY-I Screening.

ASSY-I Screening: Development and Preliminary Psychometric Analysis

ASSY-I Screening is a short self-report that measures suicide ideations and associated factors in teenagers and young adults (Galarza, 2019; Galarza et al., 2021). As mentioned before, its purpose is to identify at-risk cases of suicidal ideation. This is particularly important to prevent and detect risk cases at an early stage. Screening scales enable not only individual assessments, but also massive examinations in high schools and other institutions, due to their brevity and simplicity regarding application and scoring methods. Their high sensitivity facilitates the detection of false positives. Therefore, none of at risk-cases is overlooked.

A theoretical and clinical-empirical approach was conducted by, in order to select the dimensions and items to be included in the scale. The main purpose was to guarantee that items properly represented IPTS and its related theoretical approaches, also prioritising their clinical significance when estimating suicide risk (e.g., Anestis, et al., 2011; Chu et al., 2018; Gooding et al., 2015; Joiner et al., 2009; O'Connor & Nock, 2014; Opperman et al., 2015). As a result, the following dimensions were selected by: Suicide Ideation, Low Self-Esteem, Low Emotion Regulation, Difficulties in Problem-Solving, Lack of Social Support, and Negative Perspective of the Future. Apart from the specific dimension Suicide Ideations, the remaining five appear as important direct and indirect predictors of suicidal ideation according to studies conducted following the IPTS approach. Items content considered not only the literature, but also international scales and scales used in the local context. Experts in suicidology acted as consultants as well. In addition, statements were adapted to be in correspondence with the vocabulary and expressions commonly used by the local target population. A content validity procedure was carried out involving five experts in suicidology and psychometrics, and a pilot study with teenagers and young adults was conducted. The Aiken's V coefficient was calculated using the Visual Basic software package to analyse the degree of agreement between the experts. Consequently, instructions were improved in terms of clarity, and 54 of the original 202 items were eliminated due to their ambiguity, excessive complexity, or lack of representativeness of the dimensions.

A preliminary version of 148 statements was tested by in a sample composed of 291 students from Mar del Plata, Argentina, aged between 15 and 21 years old. Item discrimination analyses—homogeneity indices and D values—and exploratory factor analyses, using the maximum likelihood estimation method, were run. Items were eliminated when they showed at least one of the following undesirable results: a low power to discriminate between low-risk and high-risk scores— D values—, low homogeneity indices regarding the dimension they belonged to (< 0.40), and low factorial loadings (< 0.40) or factorial loadings over 0.40 in two factors.

After the above-described process, the final version consisting of a 30-item-6-factor and explaining 50.87% of the total variance was obtained by. The factors were Suicide Ideations, Difficulties with Problem-Solving, Low Emotion Regulation, Low Self-Esteem, Lack of Social Support, and Negative Perspective of the Future, each of five items. It is worth mentioning that, on the one hand, each factor explained between 7 and 10% of the variance. It means that all of them are equally important. They also remained composed of the items originally chosen to represent those factors, without requiring a change of items from one dimension to another, except for those which were eliminated as a result of the analyses due to their malfunctioning.

Suicide Ideation refers to a gradient of thoughts and feelings such as a lack of life-meaning, fantasies of endless sleep, suicide as a way of solving problems, as well as ideas of taking one's own life to end with the pain (e.g., Item 20 "I fantasised about the possibility of killing myself"). Low Self-Esteem entails self-acceptance or, in other words, how people feel about their own value and how they evaluate their own resources to cope with problems (e.g., Item 16 "I feel I'm worthless"). Low Emotion Regulation alludes to the perceived degree of control/impulsiveness in the expression of negative emotions, such as sadness, anger, frustration, and helplessness, as well as the inability to tolerate them (e.g., Item 10 "It's hard for me to control myself when I feel sad"). Difficulties with Problem-Solving suggests a self-perceived avoidant and passive style to cope with daily-life problems (e.g., Item 5 "I spend too much time worrying about my problems, instead of trying to solve them"). Lack of Social Support includes statements related to perceived social support, recognising the loved ones—family and peers—as part of a social network that involves trust, confidence, and mutual help (e.g., Item 27 "People around me accept me as I am"). And Negative Perspective of the Future is composed of statements referring to an optimistic vision of oneself and the future, perceiving facts as dynamic events, accepting uncertainty and change, even when negative events could be happening (e.g., Item 24 "I see the future with hope and enthusiasm").

Internal consistency analysis obtained acceptable ordinal alpha coefficients (0.56 to 0.83), considering that factors include very few items. Convergent and discriminant validity evidence was also examined, finding satisfactory correlational indices between the ASSY-I dimensions and four external measures (r between 0.46 and 0.64). For further details, see Galarza et al. (2021).

Despite the satisfactory results described, it is important to bear in mind that they are preliminary. In view of this, new analyses should be performed, not only on new samples, but also considering the confirmation of these exploratory findings.

Therefore, this study aimed at analysing the ASSY-I Screening scale regarding its structural validity and reliability evidence, in terms of its generalisation to other samples. To do so, the following objectives were formulated: (1) contrast the model obtained in the exploratory factor analysis previously described, comparing it with an alternative second-order model; (2) analyse the model's factorial invariance by self-perceived gender; (3) estimate the internal consistency of the ASSY-I scores for the whole sample and by self-perceived gender; and (4) examine the scores' stability-reliability.

Method

Study and Design

A psychometric-correlational study was conducted (Ato et al., 2013), following the classic tests theory approach and the ITC standards (International Test Commission, 2017). The design was non-experimental and cross-sectional.

Participants

The sample consisted of 632 students with ages from 13 to 21 years old ($M = 17.88$, $SD = 2.16$; 64.08% women, 35.92% men). Of them, 48.2% attended the last four years of high school, while 51.8% were freshmen at the public University of Mar del Plata, Argentina. Of the whole sample, 18.4% reported having self-injured at least once in the last three years. The inclusion criteria were: being between 13 and 21 years old, attending high school or college, and not having severe mental disorders.

The sample was divided by gender—as reported by each participant—to perform a factorial invariance analysis. As a result, two groups were formed: one of 405 women ($M = 17.84$, $SD = 2.23$) and another of 227 men ($M = 17.39$, $SD = 2.39$).

A smaller sample of 105 participants ($M = 18.77$, $SD = 1.69$; 74.3% women, 25.7% men) taken from the total sample was used to perform a test-retest procedure.

Instruments

Personal Data Survey

It gathered sociodemographic, familial, and clinical information: age, self-perceived gender, and self-injurious thoughts and behaviours.

Argentinean Scale of Suicidality-Youth Version—ASSY-I—Screening

Described in a previous section, the ASSY-I involves 30 items grouped into six dimensions: Suicidal Ideations, Low Self-Esteem, Low Emotion Regulation, Difficulties in Problem-Solving, Lack of Social Support, and Negative Perspective of the Future. The response method previews a 5-option Likert scale expressing the examinee's degree of agreement with each statement, from *strong disagreement* (1) to *strong agreement* (5). Even though both the Lack of Social Support and Negative Perspective of the Future dimensions are composed of positive items, for all the six factors higher scores (range 5-30) indicate higher suicide risk.

Procedure

Authorities and students of different high-schools and colleges were contacted in order to ask permission to conduct the study. The purposes of the research and the terms of the students' inclusion as examinees were explained in depth. Parents and high school and university students were informed of the objectives of the study and about the anonymity and confidentiality involved in data treatment. Participants volunteered, receiving no retribution. Once the institutional permits were obtained, the informed consent documents were delivered. As for underage students, parents had to express their agreement or disagreement regarding their children's participation. Once such parental approvals were signed, additional assent documents were required from the underage examinees themselves; otherwise, they would not participate in the study. College students, as responsible adults, accepted by signing—or not—to participate in the study.

Once the approvals were signed and the schedules were settled, the assessment was performed in collective sessions both in college and in high school classes. After each assessment session, additional psychoeducational sessions including suicide prevention interventions were conducted.

A month later, the sample recruited for the stability-reliability test-retest study was re-examined. This sample consisted of 105 participants, who had stated being available and willing for a second test session. Even though larger samples are undoubtedly preferable, it is common and accepted that smaller samples be used for supplementary studies, such as stability-reliability testing procedures. This is due to the inherent difficulties of follow-up studies: repeated measures imply logistic issues, as well as a high number of missing cases, owing to the participants' attrition. However, as suggested by Hesse-Bieber (2010), samples including at least 51 individuals for one-tail tests or 64 for two-tail tests are assumed feasible to be representative of the population, especially when recruitment successfully met the inclusion/exclusion sampling criteria. Taking into account that the sample involved 105 subjects who were tested twice, the appropriate statistical logic of the procedure was to consider them as members of two related samples, which fulfilled the representativeness requirements established for non-probabilistic samples. Moreover, it is assumed that auxiliary psychometric procedures, such as test-retest or criterion validity studies, are also quite robust when the sample size comprises a minimum number of 50 cases (Kline, 2000).

Every step of the study followed the guidelines for research involving human beings contained in the Declaration of Helsinki (World Medical Association, 2013), the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2017), and the ethical guidelines issued by the Federación de Psicólogos de la República Argentina (2013). Both the anonymity and the data confidentiality were guaranteed, according to the national Law 25,326, referred to as data protection (Ley de protección de los datos personales, 2020). Participants were also instructed about the possibility of stopping their assessment whenever they considered it. Both the research itself and the texts of the informed consent documents were

endorsed by the Bioethics Program of the Universidad Nacional de Mar del Plata, which functions as the ethics committee of such institution.

Data Analysis

An item analysis procedure was conducted in order to calculate the descriptive results and to examine floor/ceiling effects by means of the frequency distributions. Up to 15-20% floor/ceiling effects were considered acceptable, following Terwee et al. (2007) criteria recommended for health questionnaires since a non-clinical sample was being analysed with a suicide risk scale. A confirmatory factor analysis and the comparison of models—first-order model versus second-order model—were done using EQS (Multivariate Software, 2012). The robust maximum likelihood method was employed in view of its suitability for ordinal variables, samples with 200 or more participants, and the occurrence of floor/ceiling effects (Viladrich et al., 2017). Results were interpreted using the following indices: Bentler-Bonett's normed fit index (NFI), Tucker Lewis' non-normed fit index (NNFI), Bentler-Bonett's comparative fit index (CFI), and Steiger-Lind's root mean-square error of approximation (RMSEA). Those indices, along with the differences between the consistent Akaike information criterion (CAIC-C and the CAIC-I) were employed to examine the models' fit and parsimony in order to select the one that best represents the data. Thus, the difference between the CAIC-M and CAIC-I indices was calculated separately to assess each model's parsimony. The fact that the first-order model obtained a greater difference between those indices compared to the same second-order model's indicators led to assume the greater parsimony of the former (Hoyle, 2012), which runs along the same line of the behaviour of the fit indices.

The factorial invariance of the first-order model selected as the best in the previous procedure was examined using the self-perceived gender as a split variable—men and women. Four nested models with different restriction levels were tested: first, a non-restricted configural model; second, a weak measurement invariance model where factor loadings were restricted; third, a strong measurement invariance model where factor loadings and item intercepts were restricted; fourth, a strict measurement invariance model where factor loadings, item intercepts, and residual variances-covariances were restricted (Dimitrov, 2010). Such four models were compared via the CFI and RMSEA indices, where differences under 0.01 for the former and 0.015 for the latter verified the first-order model's invariance (Davidov et al., 2018; Dimitrov, 2010; Irwin & Hughes, 2018).

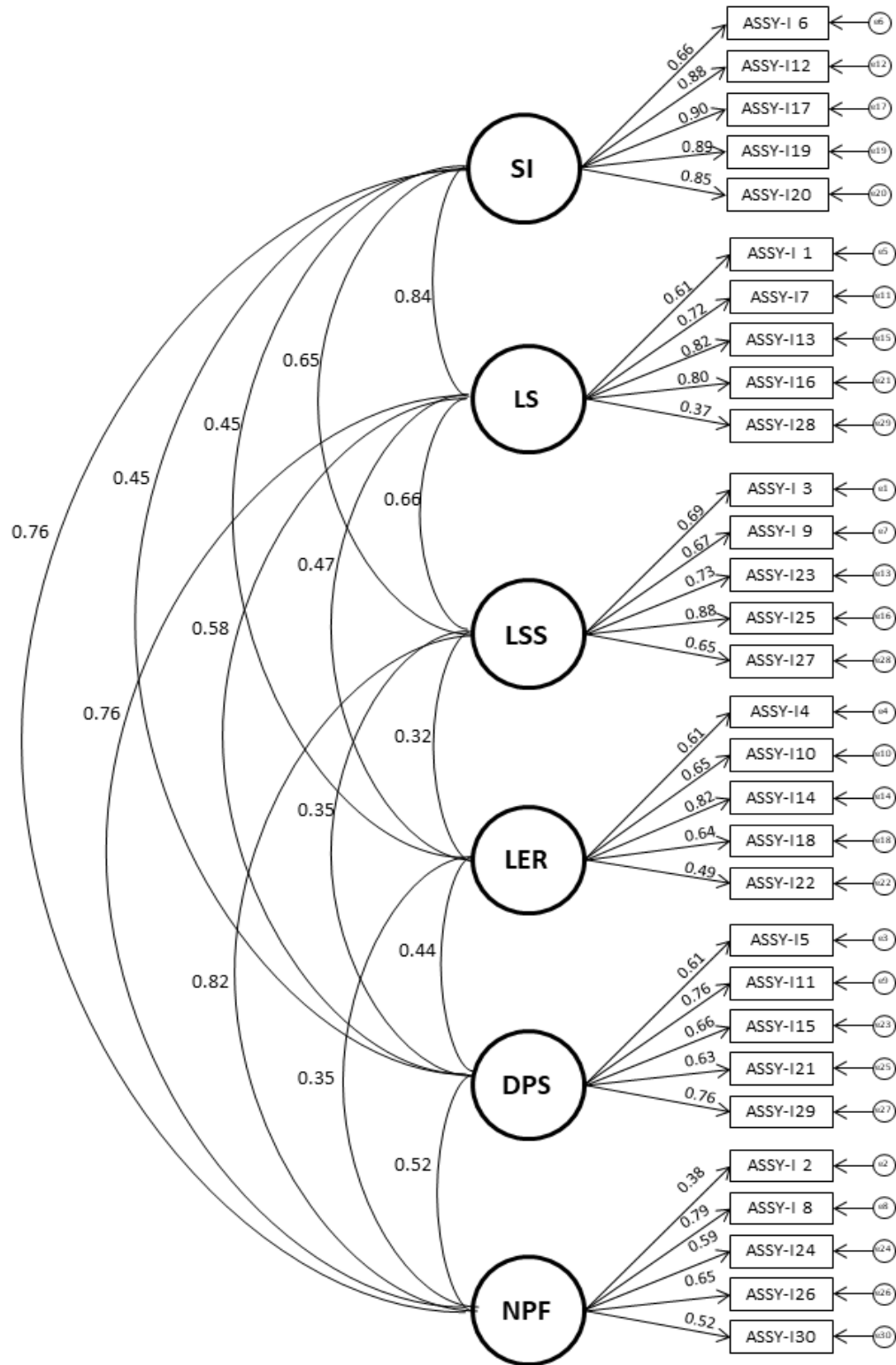
The chosen model's internal consistency was estimated, not only for the total sample but also for the men and women subsamples, via omega and Cronbach's alpha coefficients (McDonald, 1999). Afterward, such indices were compared running the Alpha Test software (Merino Soto & Lautenschlager, 2003). Finally, the scores of stability-reliability was examined by conducting a 30-day interval test-retest procedure, calculating the interclass correlation coefficient via Student's *t*-test for related samples.

Results

The confirmatory factor analysis tested the fit of two models: a first-order model and a second-order one (Figures 1 and 2). Both obtained an optimal fit, higher than 0.95 for NFI, NNFI and CFI, and lower than 0.06 for RMSEA (Brown, 2015; Kline, 2011).

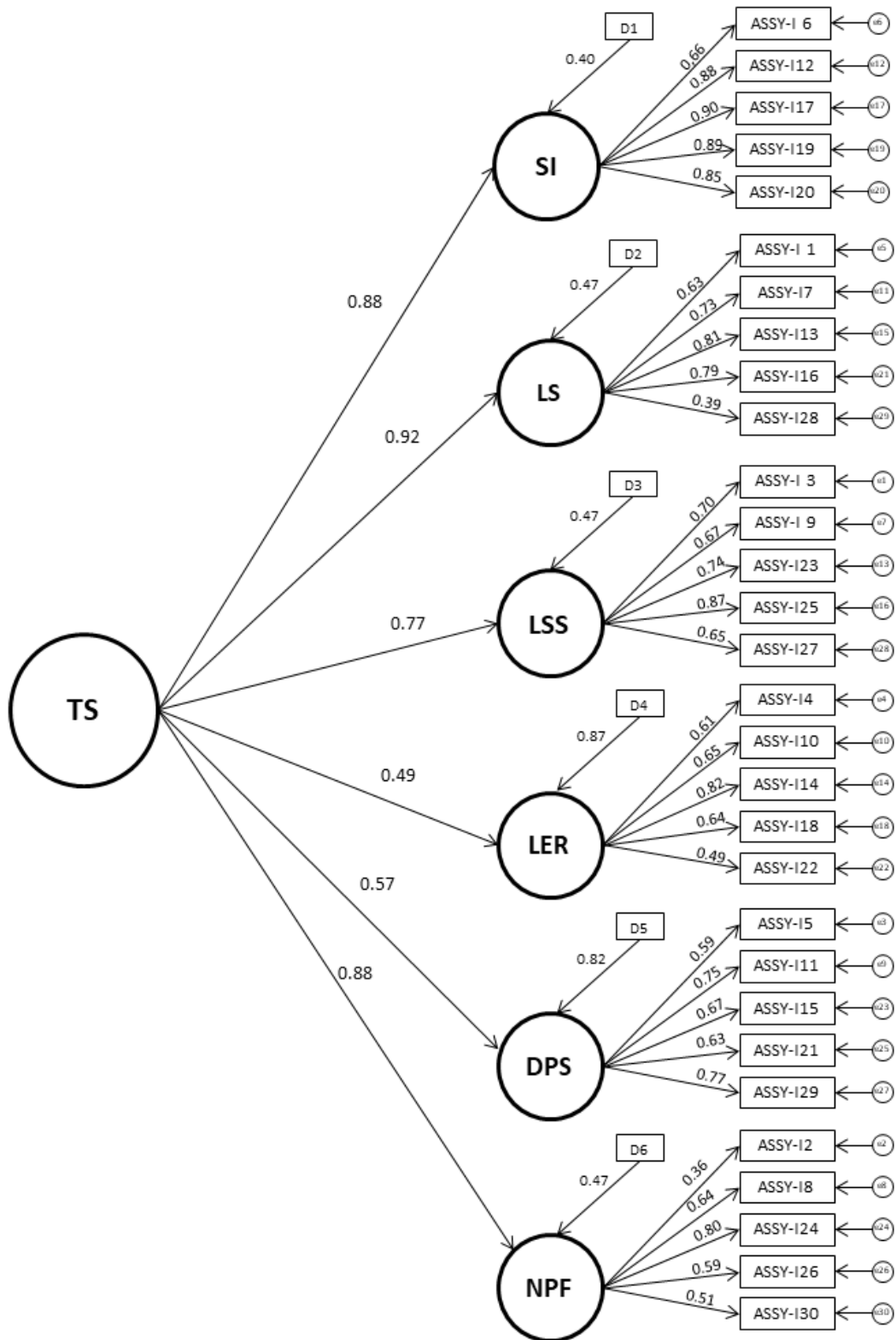
Figure 1

ASSY-I, First-Order Model



Note. Beta Standardised coefficients informed. SI = Suicide Ideations; LS = Low Self-Esteem; LSS = Lack of Social Support; LER = Low Emotion Regulation; DPS = Difficulties with Problem-Solving; NPF = Negative Perspective of the Future.

Figure 2
ASSY-I. Second-Order Model



Note. Beta Standardised coefficients informed. D = Disturbance; TS = Total score; SI = Suicide Ideations; LS = Low Self-Esteem; LSS = Lack of Social Support; LER = Low Emotion Regulation; DPS = Difficulties with Problem-Solving; NPF = Negative Perspective of the Future.

The first-order model obtained a better fit when compared to the second-order one. Moreover, the former showed a higher difference between its CAIC-M and the CAIC-I indices. That indicates higher parsimony in the first-order model (Table1). Consequently, the following analyses were run on it.

Table 1

ASSY-I. Models Fit Comparison

Model	χ^2	<i>df</i>	NFI	NNFI	CFI	CAIC-M	CAIC-I	RMSEA [90% CI]
1 st order	894612	390	0.960	0.974	0.977	-2010.454	18859.922	0.045 [0.041, 0.049]
2 nd order	959.057	392	0.957	0.971	0.974	-1960.907	18859.922	0.048 [0.044, 0.052]

Note. Total $n = 632$.

Figure 1 shows, on the one hand, that eight of the 15 estimated covariances obtained indices between 0.50 and 0.85, thus inferring the independence of the factors. On the other hand, seven covariances achieved values around 0.40, implying divergent validity evidence (Rial Boubeta et al., 2006). Nevertheless, since such values were not far from the lower cut-off point of 0.50, adding intermediate latent variables among the factors was not required.

The analysis of the estimated parameters for the items indicated that 8 out of their determination coefficients had reached values higher than 0.60. That implies they contribute 40% to 50% of their variability to explain the latent variables they are associated with (Hancock & Mueller, 2013). In order to gain brevity, the items' determination coefficients, as well as statistical descriptive results and the floor/ceiling effects are shown all together in Table 2.

As expected, most items presented a substantial floor effect. This refers to the percentage of participants with the lowest possible score, particularly in those items representing the most significant clinical indicators in each factor, such as item 17 from Suicide Ideations "Dying can solve my problems", item 13 from Low Self-Esteem "I can't stand myself", item 9 from Lack of Social Support (reverse) "I count with people I can trust", item 15 of Difficulties with Problem-Solving "I tend to let problems work themselves out", item 18 from Low Emotional Regulation "When I feel frustrated or impotent I want to break everything", and item 26 from Negative Perspective of the Future (reverse) "I have plans for the future that I would like to achieve".

Table 2*ASSY-I. 1st Order Model: Items' Determination Coefficients and Descriptive Data*

Factor	Item	R^2	M	SD	S	K	%F	%C
Suicide Ideations	ASSY 17	0.818	1.35	0.808	2.731	7.589	78.8	1.7
	ASSY 19	0.791	1.44	0.837	2.241	5.179	72.0	1.7
	ASSY 12	0.772	1.42	0.823	2.365	5.937	73.4	1.9
	ASSY 20	0.730	1.40	0.794	2.296	5.399	73.7	1.1
	ASSY 6	0.441	1.96	1.039	1.111	0.806	40.8	3.5
Low Self-Esteem	ASSY 13	0.654	1.67	1.002	1.631	2.237	59.3	3.2
	ASSY 16	0.632	1.88	1.065	1.176	0.738	48.1	3.3
	ASSY 7	0.528	2.28	1.152	0.588	-0.481	32.1	4.7
Lack of Social Support	ASSY 28	0.428	2.12	0.995	0.846	0.506	29.3	3.2
	ASSY 1	0.389	2.39	1.031	0.382	-0.341	22.2	3.2
	ASSY 25	0.777	1.82	0.887	1.119	1.193	42.7	1.3
	ASSY 23	0.538	2.47	0.963	0.358	-0.068	15.8	3.0
	ASSY 3	0.480	1.92	0.870	0.774	0.474	36.2	1.1
Difficulties with Problem-Solving	ASSY 9	0.444	1.66	0.877	1.422	1.983	54.6	1.4
	ASSY 27	0.412	2.12	1.019	0.841	0.820	31.2	3.3
	ASSY 11	0.577	2.74	1.116	0.333	-0.593	12.3	7.9
	ASSY 29	0.574	2.74	0.989	0.061	-0.135	12.2	4.6
Low Emotion Regulation	ASSY 15	0.437	2.33	1.087	0.506	-0.408	26.3	3.8
	ASSY 21	0.397	2.44	1.063	0.396	-0.397	21.4	4.6
	ASSY 5	0.371	3.10	1.179	0.111	-0.907	7.4	15.8
	ASSY 14	0.669	2.78	1.303	0.256	-1.008	19.3	13.8
	ASSY 10	0.424	2.75	1.230	0.342	-0.849	15.8	11.4
	ASSY 18	0.409	2.48	1.280	0.509	-0.779	28.3	9.7
	ASSY 4	0.371	3.23	1.214	-0.097	-0.924	8.4	18.8
Negative Perspective of the Future	ASSY 22	0.241	2.92	1.058	0.071	-0.438	9.7	7.8
	ASSY 24	0.716	2.01	0.974	0.799	0.175	36.2	1.7
	ASSY 26	0.386	1.44	0.761	2.108	5.035	68.4	0.9
	ASSY 30	0.320	1.49	0.749	1.713	3.426	63.3	0.8
	ASSY 8	0.258	2.17	1.034	0.610	-0.182	31.6	2.7
	ASSY 2	0.117	2.27	0.958	0.686	0.115	19.6	2.1

Note. $n = 632$. R^2 coefficients over .40 are highlighted in bold. S = Symmetry; K = Kurtosis; %F = Floor, percentage of participants with the lowest possible score; %C = Ceiling, percentage of participants with the highest possible score.

The factorial invariance study for the first-order model was conducted employing the self-perceived gender as a split variable. Four models with different restriction levels were tested: configural, weak, strong, and strict. The invariance across the split subsamples composed exclusively of men and women was verified (Table 3).

Table 3
ASSY-I. 1st Order Model: Factorial Invariance

Model	CFI	Δ CFI	RMSEA	90% CI for RMSEA	Δ RMSEA
Configural	0.982	-	0.040	[0.035, 0.044]	-
Weak	0.975	0.007	0.045	[0.041, 0.050]	-0.005
Strong	0.975	0.007	0.045	[0.041, 0.050]	-0.005
Strict	0.987	-0.005	0.033	[0.027, 0.037]	0.007

Note. $n = 632$.

Omega and alpha coefficients were calculated for each dimension, not only in the total sample but also in the subsamples split by gender, in order to analyse the scores' internal consistency (Table 4). When comparing those indices by subsamples, adequate values without statistical significance among them were found. It means that equivalency in the accuracy of measurement across both groups can be assumed.

Table 4
ASSY-I. Internal Consistency Analysis: Omega and Alpha Coefficients

Factor	Coefficient	Total	Men	Women	χ^2	<i>Df</i>	<i>p</i>
SI	ω	0.923	0.915	0.923	0.758	2	0.684
	α	0.919	0.913	0.919	0.400	2	0.818
LS	ω	0.843	0.833	0.838	0.225	2	0.893
	α	0.799	0.829	0.834	2.412	2	0.299
LSS	ω	0.848	0.852	0.831	1.124	2	0.569
	α	0.847	0.850	0.828	1.262	2	0.531
DPS	ω	0.816	0.800	0.821	0.778	2	0.677
	α	0.812	0.796	0.818	0.816	2	0.664
LER	ω	0.781	0.770	0.774	0.144	2	0.930
	α	0.776	0.758	0.768	0.355	2	0.837
NPF	ω	0.723	0.755	0.704	2.119	2	0.346
	α	0.712	0.746	0.688	2.499	2	0.286

Note. $n = 632$; *Men* $n = 227$; *Women* $n = 405$; SI = Suicide Ideations; LS = Low Self-Esteem; LSS = Lack of Social Support; LER = Low Emotion Regulation; DPS = Difficulties with Problem-Solving; NPF = Negative Perspective of the Future.

The scores of stability-reliability analysis obtained satisfactory interclass correlation coefficients in a 30-day interval procedure (Table 5). In all cases, Student's *t*-tests for correlated samples were found non-significant.

Table 5
ASSY-I. Stability-Reliability Interclass Correlation Coefficients

	SI	LS	LSS	LER	DPS	NPF
Time 1						
<i>M (SD)</i>	7.14 (2.93)	9.99 (3.77)	9.27 (2.86)	14.98 (3.82)	13.59 (3.97)	9.14 (2.57)
Time 2						
<i>M (SD)</i>	7.31 (3.11)	9.72 (4.22)	9.00 (3.09)	14.62 (3.86)	13.52 (3.93)	9.15 (2.83)
<i>ICC</i>	0.926	0.867	0.826	0.753	0.827	0.743
<i>CI_{95%} for ICC</i>	[0.846, 0.962]	[0.804, 0.909]	[0.740, 0.890]	[0.668, 0.827]	[0.750, 0.885]	[0.663, 0.819]
<i>p</i>	0.137	0.196	0.124	0.182	0.769	0.960

Note. $n = 105$; SI = Suicide Ideations; LS = Low Self-Esteem; LSS = Lack of Social Support; LER = Low Emotion Regulation; DPS = Difficulties with Problem-Solving; NPF = Negative Perspective of the Future.

Discussion

This study added and broadened evidence on the dimensionality of the Argentinean Scale of Suicidality-Youth version—ASSY-I Screening—, replicating findings reported in a previous study where a 6-factor model had been extracted in exploratory factor analysis (Galarza, 2019; Galarza et al., 2021). When comparing such a 6-factor-first-order model with an alternative second-order model, the former showed more adequacy in terms of fit and parsimony, even though both obtained a good fit in general terms. Such a result led to choosing the first-order model as the one to be examined in depth.

The factorial invariance of the first-order-6-factor model was verified when splitting the sample by self-perceived gender. That is important since it adds evidence in favour of the hypothesis which claims the ASSY-I model's robustness, either in the whole sample or in subsamples each composed of women and men.

The internal consistency and stability-reliability studies achieved adequate indices. It is worth mentioning that the values of internal consistency for the Negative Perspective of the Future and the Low Emotion Regulation factors were lower. However, they are acceptable considering that those dimensions are composed of very few items covering a heterogeneous variety of domains (Coulacoglou & Saklofske, 2017). No statistically significant differences in internal consistency coefficients were found when comparing men's and women's scores. This implies accuracy in the measures across such groups, and a non-biased assessment according to self-perceived gender as well, at least regarding the traditional binary categorisation that participants referred to belong (Feldt & Kim, 2006; Fletcher-Janzen et al., 2000; Lautenschlager & Meade, 2008). Such a result also strengthens the hypothesis of the model's generalisation. Given the difference in the prevalence rate between men and women, scales assessing suicide risk with proven psychometric robustness across both groups arises as useful for clinicians, psycho-educational psychologists, and researchers.

Regarding the confirmed factors, some theoretical ideas related to practical implications deserve a proper mention. The factor Suicide Ideations showed the highest explanatory power and the highest internal consistency and stability indices. It assesses passive and active suicide ideations, including statements such as the lack of life meaning and the fantasy of disappearing. A decision was made to assess a broader concept of suicidal ideations instead of a narrow notion involving only active thoughts linked to suicide, because this scale is intended as a screening device. As such, it must prioritise sensitivity over specificity. If this screening self-report measured only the narrower notion of active thoughts connected with suicide, the occurrence of false-negative cases would increase at the beginning of a suicide process that is not yet clearly manifested.

The Low Self-Esteem Factor 2, as operationalised in ASSY-I, is consistent with one of IPTS' main concepts, the perceived burdensomeness which entails a negative self-image, self-hatred, and self-rejection, consequently promoting isolation (Van Orden et al., 2010). Findings indicate that this dimension was the one that showed the larger positive association with Suicide Ideations with a covariance of .84. This seems reasonable, since the link between suicidal behaviours and self-esteem has been repeatedly proven (e.g., Chatard et al., 2009; Gooding et al., 2015; Opperman et al., 2015). Such a large covariance coefficient raises the statistical question of whether both factors should be included. However, from a combined theoretical-

clinical standpoint, it seems appropriate to keep Suicide Ideations and Low Self-Esteem as separate dimensions: even though at-risk teens and young adults exhibit a substantial decrease in their self-esteem, not all of them with low self-esteem evolve into suicidal behaviours (e.g., Sharaf et al., 2009). Bearing this in mind, the separate interpretation of both latent variables emerges as essential, both in clinical assessment and in massive testing devices seeking at-risk cases. Taking both indicators into consideration will allow clinicians to develop personalised preventive interventions, not only primary but also secondary (Anseán, 2014).

Regarding Factor 3, Lack of Social Support, loneliness and social isolation are interpersonal variables that have verified robust evidence regarding its impact on suicidality in the young population (e.g., Joiner et al., 2009; Opperman et al., 2015; Van Orden et al., 2010). When the social network is perceived as narrow and insufficient, the feeling of thwarted belongingness arises, as well as burdensomeness to a minor extent. The two are central notions of the IPTS model and also clinical indicators worthy to be explored in depth.

As for Factor 4, including Difficulties with Problem-Solving as a dimension emerges as an added value of ASSY-I Screening, since there are no other scales assessing this domain. Perceiving oneself as powerless and helpless to deal with stress increases the feeling of being unable to control vital events. It also increases the negative self-perception, the feeling of burdensomeness, and pessimistic emotions about the future, therefore, having an indirect effect on the development of suicide ideations (e.g., Chu et al., 2018; Gautam, 2016; Quiñones et al., 2015).

Concerning the Low Emotion Regulation, identified as ASSY-I's fifth factor, there is a wide consensus on its key role when analysing suicide risk matters (e.g., Mikolajczak et al., 2009; Pisani et al., 2013). In fact, the lack of tolerance toward emotional distress has been identified as an efficient predictor of the desire for suicide. Moreover, the proneness to act impulsively in order to relieve such distress has been identified as a robust predictor of the acquired capability for suicide (Anestis et al., 2011).

The last factor, Negative Perspective of the Future, obtained the lowest values in its parameters, where item 2 was found to be especially problematic. However, the large amount of evidence on the link between optimism/hopelessness and suicide risk led to the decision of retaining the dimension in order to analyse whether its functioning achieves better indicators in clinical samples of attempters in future research. Studies indicated that the polarity optimism/hopelessness not only makes an impact on self-esteem, self-efficacy, and problem-solving ability, but it is also linked to the perception of a lack of social support and belongingness, on the one hand, and the perception of burdensomeness, on the other. It is important to bear in mind that each one of these variables plays a key role in the emergency of suicide ideations (O'Keefe & Wingate, 2013; Tucker et al., 2018).

As the results have shown, though the six factors described above are related, they also maintain some independence. Therefore, the measurement of each one seems crucial since their joint emergence substantially boosts the likelihood of developing suicidal ideations. It seems essential to assess suicide risk at a screening stage, consistently with the most current theoretical and empirical developments (e.g., Chu et al., 2018; Joiner et al., 2009; Nock et al., 2008; O'Connor & Nock, 2014; Opperman et al., 2015). It is indispensable for factorial models to be not only empirically robust but, above all, interpretable from the theoretical models of suicide background. Otherwise, their clinical utility would be a matter of concern when risk detection is the urgent goal (Lloret-Segura et al., 2014). Thus, the combination of empirical, clinical, and theoretical criteria led to support the decision of maintaining the confirmed 6-factor model, in view of its value for individual results interpretations and for the design of possible further interventions.

As for the limitations of the study, the most significant one lies in the impossibility of including a clinical sample with a previous suicide attempt. That inclusion would add robustness to the items analysis in terms of their representativeness and discriminant power, as well as to the rest of ASSY-I's psychometric features. Moreover, gathering at least 50 cases with current suicide ideations and/or prior suicide attempts would enable further analyses of the floor effects verified in this study (Terwee et al., 2007). Also, using wider and more heterogeneous samples—e.g., teenagers and young adults from different regions of the country and who remain out of the educational system— would deepen the analyses of the scale's factorial structure. If results are confirmed once again, it will favour the hypothesis of its generalisation across diverse samples and populations, either clinical or community.

Testing the model's factorial invariance using age as a splitting variable represents a further issue to be addressed. Doing so seems particularly important, given that participants were between 13 and 21 years old. Such an age group not only corresponds to the broad spectrum which evolves from early adolescence to young

adulthood, but also includes the population whose fourth cause of death worldwide is suicide, being the second in Argentina (Dirección de Estadísticas e Información en Salud, 2021; WHO, 2021).

Likewise, it is undoubtedly desirable to test path models of the ASSY-I factors to establish how they are related in terms of indirect effects. The interactions between the dimensions should be examined, therefore generating valuable information to plan direct interventions specifically tailored for the different stages of the sequence of influences composing the development of suicide ideations. Issues of such importance should also be addressed in further research. Besides, conducting studies to determine cut-off points in order to let each dimension reach maximum sensitivity and specificity by means of ROC curves seems essential for scales assessing clinical variables (Runeson et al., 2017).

In sum, findings proved the suitability of the ASSY-I Screening to be used in the local population of young students, due to its adequate construct validity evidence—at a confirmatory stage—, its factorial invariance by self-perceived gender—men-women—and its adequate reliability results—internal consistency and stability-reliability. This degree of evidence is in line with the hypothesis of the model's robustness and its generalisation to students from 13 to 21 years old, who represent the higher risk group according to official reports (WHO, 2021). Furthermore, the ASSY-I Screening is part of an integrated assessment device, since its use is complementary to the diagnostic scale ASSY-II, which estimates the intentionality of the suicidal act. The use of the latter is advisable when a case reaches scores indicating risk at the screening early stage.

Shortness, simplicity, and psychometric robustness added to the feasibility of using it either individually or collectively make ASSY-I suitable to be employed by researchers as well as practitioners in the educational, community, and clinical contexts.

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