GRUPO EDITORIAL DE PSICOFUNDACIÓN

Psicothema (2024) 36(4) 403-413

Psicothema

https://www.psicothema.com/es • ISSN 0214–9915 • eISSN 1886-144X

Colegio Oficial de Psicología del Principado de Asturias

Article

Suicidal Behavior and Social Cognition: The Role of Hypomentalizing and Fearlessness About Death

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ARTICLE INFO

Received: March 11, 2024
Accepted: May 28, 2024

Keywords:
Suicide attempt lethality
Suicidal ideation
Self-harm
Fearlessness about death
Mentalizing
Social cognition

ABSTRACT

Background: Suicide attempt (SA) lethality is associated with heightened suicidal desires and social cognition deficits. Fearlessness about death (FAD) and hypomentalizing may play a role in SA and self-harm. Although studies have identified relationships between these constructs, this line of research is still limited. We aimed to explore the mediating role of FAD and mentalizing between suicidal ideation and both SA lethality and self-harm. **Method:** 1,371 suicide attempters (70.1% women; *M* = 40 years) from seven Spanish hospitals participated. We used the Fearlessness About Death (ACSS-FAD) subscale, the Reflective Functioning Questionnaire-8 (RFQ-8), and the Columbia Suicide Severity Rating Scale (CSSRS). We conducted serial multiple mediation analyses with suicidal ideation as exposure; FAD and mentalizing as mediators; SA lethality and self-harm as outcomes. **Results:** Indirect effects were found of suicidal ideation on self-harm (*B* = 0.08, *CI* = 0.03-0.15) and SA lethality mediated by FAD (*B* = 0.02, *CI* = 0.001-0.04); indirect effects of suicidal ideation on self-harm through mentalizing (*B* = 0.10, *CI* = 0.04-0.167), and total indirect effects between suicidal ideation and self-harm through FAD and mentalizing (*B* = 0.18, *CI* = 0.11-0.27). **Conclusions:** Interventions addressing mentalizing and FAD may help reduce SA lethality and self-harm risk.

Cite as: Andreo-Jover, J., Fernández-Jiménez, E., Bobes, J., Cebria, A. I., Crespo-Facorro, B., De la Torre-Luque, A., Díaz-Marsá, M., García-Ramos, A., Grande, I., González-Pinto, A., Jiménez-Treviño, L., Roberto, N., Ruiz-Veguilla, M., Palao-Tarrero, A. & Pérez-Sola, V. (2024). Suicidal behavior and social cognition: The role of hypomentalizing and fearlessness about death. *Psicothema, 36*(4), 403-413. https://doi.org/10.7334/psicothema2024.82
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Conducta Suicida y Cognición Social: el Papel de la Hipomentalización y la Temeridad Ante la Muerte

Palabras clave:
Letalidad del intento suicida
Ideación suicida
Autolesión
Temeridad ante la muerte
Mentalización
Cognición social

RESUMEN

Antecedentes: La letalidad del intento suicida (IS) se asocia con deseo suicida incrementado y cognición social deficitaria. La temeridad ante la muerte (FAD) e hipomentalización podrían desempeñar un papel en IS y autolesiones. Aunque la investigación ha identificado una relación entre estos constructos, ésta es limitada. Este estudio examina el papel mediador de FAD y mentalización entre ideación suicida y letalidad del IS y autolesiones. **Método:** Participaron 1.371 pacientes tras un IS (70,1% mujeres; *M* = 40 años), de siete hospitales españoles. Empleamos la subescala Temeridad Ante la Muerte (ACSS-FAD), Cuestionario de Funcionamiento Reflexivo-8 (RFQ-8) y Escala de Gravedad del Suicidio Columbia (CSSRS). Analizamos mediación serial múltiple con ideación suicida como exposición; FAD y mentalización como mediadores; letalidad del IS y autolesiones como resultados. **Resultados:** Se obtuvieron efectos indirectos entre ideación suicida (*B* = 0,08; *CI* = 0,03-0,15), autolesiones y letalidad del IS, mediados por FAD (*B* = 0,02; *CI* = 0,001-0,04); entre ideación suicida y autolesiones, mediadas por mentalización (*B* = 0,10; *CI* = 0,04-0,17), y efectos indirectos totales entre ideación suicida y autolesiones mediante FAD y mentalización (*B* = 0,18; *CI* = 0,11-0,27). **Conclusiones:** Intervenciones en mentalización y FAD pueden disminuir la letalidad del IS y riesgo autolesivo.

Worldwide, more than 700,000 people die by suicide annually (Ilic & Ilic, 2022). In Spain, 4,227 people died by suicide in 2022, estimating that approximately one suicide occurs per 24 suicide attempts (SAs), defined as self-injury behavior with the intention of ending one's own life (Instituto Nacional de Estadística, n.d.). Suicidal behavior is not a mental disorder or a symptom of a psychopathological disorder (Al-Halabí & Fonseca-Pedrero, 2021). It encompasses a spectrum of manifestations, ranging from ideation or thoughts of ending one's own life, to suicide attempts or death by suicide (American Psychiatric Association, 2013). The prevalence in Spanish samples from the general population is 8.8% for suicidal ideation (Sáiz et al., 2020) and 1.7% for SA (Cayuela et al., 2023). On the other hand, non-suicidal self-harm is defined as behavior that causes injuries to one's body in the absence of intent to die. These behaviors emerge as an outcome of intricate interactions involving biological, psychological, clinical, environmental, and social components (Al-Halabí & Fonseca-Pedrero, 2023; Arensman et al., 2019; De la Torre-Luque et al., 2022; O'Connor & Nock, 2014; Turecki et al., 2019).

The degree of SA lethality depends on the urgency of the medical care required. Severe SAs are characterized by a heightened risk of fatality in the absence of timely medical intervention (Kim et al., 2020). Several factors contribute to the heightened lethality of SA, including male sex (Choo et al., 2019), older age (Barker et al., 2022), marital status (Øien-Ødegaard et al., 2021), history of mental disorders (Salagre et al., 2021; Seo et al., 2021), impulsivity (González-Ortega et al., 2023), and previous SAs, with the latter being one of the predictors most strongly associated with high SA lethality (Barker et al., 2022). Furthermore, a recent systematic review investigated the factors associated with high SA lethality, highlighting deficits in social relationships as a contributing factor (Levi-Belz et al., 2022). In this regard, the interpersonal theory of suicide (IPTS) (Joiner, 2005) posits that suicidal desires emerge when individuals experience thwarted belongingness and feelings of perceived burdensomeness, which increases their acquired capacity for suicide (Chu et al., 2017; Drabenstott, 2019; Forkmann et al., 2020). This capacity refers to an individual's ability to engage in suicidal behavior. Repeated exposure to painful events increases the tolerance to physical pain and hopelessness (Pérez Rodríguez et al., 2017), reducing the fear of death (fearlessness about death [FAD]). FAD involves habituation to pain and death, which could facilitate the transition from suicidal ideation to death. FAD has been associated with suicidal ideation (Marie et al., 2020; Ribeiro, Silva, et al., 2014; Rogers et al., 2022) and with high SA lethality in adolescents (Krantz et al., 2022). However, there is a lack of research on the relationship between FAD and self-harm or between FAD and SA lethality in adults.

Within the IPTS framework, mentalizing, which is defined as the capacity to comprehend and attribute mental states to oneself and others (Fonagy et al., 2016), might play a pivotal role in facilitating the interpretation of social and emotional cues exhibited by individuals (De Prisco et al., 2023). In this regard, hypomentalizing, characterized by excessive uncertainty regarding mental states, could contribute to heightened social withdrawal (De La Higuera-González et al., 2023), potentially exacerbating feelings of thwarted belongingness and perceived burdensomeness. Therefore, hypomentalizing might play a relevant role alongside FAD in increasing the likelihood of suicidal behavior. Moreover, although recent studies have found associations between hypomentalizing and self-harm (Badoud et al., 2015; Stagaki et al., 2022), hypomentalizing and suicidal ideation (Hatkevich et al., 2019), and hypomentalizing and the number of SAs (Andreo-Jover et al., 2024), no previous study has explored the association between hypomentalizing and SA lethality. Given that mentalization is a modifiable factor using evidence-based treatments (e.g., mentalization-based therapy [MBT] protocols), analyzing the relationship between mentalization deficits and other key outcomes is clinically relevant to addressing self-harm and suicidal behavior.

To the best of our knowledge, there is a lack of research on social cognition among survivors of highly lethal SAs. Addressing this gap holds significant potential practical implications for designing prevention programs aimed at reducing suicidal behaviors. Specifically, focusing on interventions that enhance social cognition might prove to be particularly beneficial. Consequently, the main objective of the present study was to analyze the potential mediating role of FAD and hypomentalizing

in the relationship between suicidal ideation and both self-harm and SA lethality. We hypothesized that FAD and hypomentalizing would mediate the relationship between suicidal ideation and self-harm and SA lethality. Secondary objectives included an examination of differences by level of SA lethality and by the presence or absence of self-harm, and to study the association between suicide ideation, FAD, hypomentalizing, self-harm, SA lethality, and sociodemographics. We hypothesized that high SA lethality would be related to older participants, the presence of suicidal ideation, higher levels of FAD, and hypomentalizing, whereas the presence of self-harm would be related to younger patients, female sex, higher levels of FAD, and hypomentalizing. We also hypothesized an association between suicidal ideation, self-harm, SA lethality, and levels of FAD and hypomentalizing.

Method

Participants

The sample of this study consisted of 1,371 participants (aged ≥18 years), all of whom had attempted suicide within a maximum period of 15 days. The mean age of the sample was 40 years (*SD* = 15.6, range 18-93 years), the sex distribution was 70.2% female, and the average number of years of education was 11.9 (*SD* = 3.8, range 0-16 years). Participants were recruited as part of a national multisite, coordinated cohort study from the emergency departments of seven healthcare centers in Spain.

An *a priori* sample size estimation was conducted using a structural equation model (Kim & Willson, 2014). Specifically, an optimal ratio of cases/parameter to be estimated should be ensured (i.e., a ratio of 20:1) to obtain an effect size of at least ω^2 = .03 and alpha = .05, to preserve acceptable levels of accuracy of fit indices. The sample size for the minimum requirement of the survival model was over 500 participants within the cohort.

Inclusion criteria were as follows: a) age 18 years or older, and b) attempted suicide with a recognized death intention within the last 15 days. Exclusion criteria were as follows: a) inability to give informed consent, b) lack of fluency in Spanish, and c) taking part in another clinical study that was likely to interfere with the objectives of this study. All of these criteria were established *a priori*. All participants were informed about the study details in Spanish and voluntarily signed an informed consent form.

Instruments

In an *ad hoc* survey, participants were asked about their sex, age, years of education, marital status, and employment situation. Moreover, during a clinical evaluation, we assessed suicidality domains (with the Columbia-Suicide Severity Rating Scale [CSSRS]) and then asked the participants to complete the FAD and hypomentalizing self-report measures as follows:

Suicidality Domains

The CSSRS (Posner et al., 2011) was used to assess suicidal ideation, self-harm, and SA lethality. Using three single items, participants were asked about the occurrence of suicidal ideation in the previous month (item 2. Non-Specific Active Suicidal Thoughts: "*Have you actually had any thoughts of killing yourself?*", with dichotomous response options: Yes/No); lifetime presence of non-suicidal self-harm ("*Has the subject engaged in Non-Suicidal Self-Injurious Behavior?*", with dichotomous response options: Yes/No); and the lethality of the most recent SA ("*Actual Lethality/ Medical Damage*"). The lethality score ranged from 0 (no injuries caused) to 4 (severe physical injury requiring intensive care), based on the risk of death associated with SA. Later, a dichotomous lethality score was computed depending on the risk of death, according to the following criteria: CSSRS scores of 0 and 1 were classified as the low SA lethality group, whereas CSSRS scores of 2, 3, and 4 were categorized as the high SA lethality group, following the criteria established in recent studies (Barker et al., 2022; Brokke et al., 2022). The validity of the CSSRS has recently been supported among Spanish outpatients attending mental health services (Al-Halabí et al., 2016).

Fearlessness About Death

We employed the Fearlessness About Death-Acquired Capability for Suicide Scale (ACSS-FAD), which includes seven items to assess diminished concern about death (Ribeiro, Witte, et al., 2014; Van Orden et al., 2008). The items are rated on a 5-point Likert-type scale from 0 (not at all like me) to 4 (very much like me), and items 2, 3, and 5 have reversed scores. The total scores ranged from 0 to 28, with higher scores indicating greater levels of FAD. Psychometric analyses in some studies have shown good reliability (α = .83) (Ribeiro, Witte, et al., 2014).

Hypomentalizing

We measured hypomentalizing using the Spanish version of the short form of the Reflective Functioning Questionnaire (RFQ-8) (Streiner et al., 2015), a self-report measure consisting of eight items on a seven-point Likert scale (from 1 = strongly disagree, to 7 = strongly agree). The initial RFQ-8 scoring procedure generated two subscales: hypomentalizing or uncertainty about mental states, and hypermentalizing or certainty about mental states (Fonagy et al. 2016). However, after the concerns raised in recent psychometric analyses (Müller et al., 2022; Spitzer et al., 2021), we adopted a unidimensional RFQ-8 scoring approach, which was recommended in a recent Spanish validation (Ruiz-Parra et al., 2023). Specifically, the total score was computed by reversing the scoring of Item 7 to align with the overall scale polarity; the mean across all items was subsequently calculated. Regarding the final score of the scale, a higher value indicated a tendency toward hypomentalizing and a lower value a genuine mentalizing stance. The reliability of this recent version has been established in both the general population (α = .76) and among individuals with personality disorders (α = .78) (Ruiz-Parra et al., 2023).

Procedure

Assessments were conducted in person, within a maximum of 10 days following medical discharge after an SA and in the context of a specific appointment in a hospital office for participation in the study. Data collection was performed by study researchers at every site (psychologists and psychiatrists) who had training in clinical assessment to establish standardized administration

and rating criteria. This training was performed before the study began, to ensure that any potential errors in test administration or correction were minimized. The approximate time required to complete the assessment was 90 minutes. Data were collected between December 1, 2020 and September 8, 2022. This study employed cross-sectional data and constituted a secondary analysis of a subset from the baseline measurement point of a 1-year follow-up observational cohort study, as described in the study protocol published elsewhere (Pérez et al., 2020). Our study received approval from the coordinating center ethics committee (Parc Salut del Mar Committee for Drug Research), and it was also ratified by the ethics committees of the remaining recruitment centers.

Data Analysis

To address the secondary objective, we conducted descriptive analyses to explore the demographics and clinical characteristics in the current sample, employing Student's *t* and chi-square tests to compare the low- and high-lethality groups. The sex variable was dichotomized, and only male (coded as value 1) or female (value 2) sex was considered. We found 26 participants who refused to answer the self-reported questionnaires; therefore, we reported missing data (see Table 1). Moreover, to examine the relationships between suicidal ideation, self-harm, SA lethality, hypomentalizing, and FAD, an adequate correlation coefficient was calculated according to the measurement scale for each case (i.e., Pearson, Spearman, and point biserial). To address the main objective, we employed serial multiple mediation models to test our hypotheses. Serial multiple mediation analysis is a statistical method used to examine the sequential relationships among variables in a mediation model that involves more than one mediator. We proposed an indirect pathway between the presence of suicidal ideation exposure (0/1) and both self-harm (0/1) and SA lethality (from 0 to 4) outcomes, mediated by FAD and hypomentalizing. Specific indirect effect contrast analyses were also performed to compare the relevance of mediators to both outcomes. Lastly, we built two independent diagrams, one for each outcome (SA lethality and self-harm), to describe the regression weights between the principal variables, controlling for age and sex as covariates. The significance level was set at $p < .05$ for all analyses, and appropriate effect size indices were utilized for each specific statistical test (Cohen's *d*, Cramer's *V*, and correlation coefficients), following the Cohen's interpretation guidelines (Cohen, 1992). The mean inter-item correlation (MIC) was computed as an internal consistency index for reliability analysis. The statistical software SPSS 29.0 was used for data analysis, including the SPSS AMOS package and PROCESS macro, to conduct applied structural equation modeling (Collier, 2020).

Results

Descriptive Analyses

Distributions, means, standard deviations, and effect sizes of the demographics and clinical characteristics of the participants with low and high SA lethality are presented in Table 1. The high SA lethality group was significantly older ($p < .001$), had more participants with previous suicide ideation, and had a higher FAD level ($p = .007$) than the low lethality group. The self-harm group was significantly younger ($p < .001$), had a higher percentage of females ($p = .003$), a lower percentage of married participants ($p < .001$), a higher FAD level ($p = .001$), and a higher level of hypomentalizing ($p < .001$).

Reliability and Sources of Validity Evidence of Variables

On the one hand, regarding the CSSRS, given that only three single items were used to measure each suicidality domain in this study, the computation of total test reliability is not applicable in this sample. On the other hand, regarding the FAD subscale, the MIC was .28 in the current sample, indicating an internal consistency within the optimal range (i.e., from .15 to .50) according to Clark and Watson (1995). Regarding sources of validity evidence, FAD and SA lethality are distinct constructs and, as expected, the FAD subscale correlated very poorly (very small effect size) with SA lethality ($r = .06$, $p = .026$) in the current sample, indicating discriminant validity. Lastly, the mean inter-item correlation for the RFQ-8 was .31 in the current sample, which is within the optimal range for internal consistency. Regarding sources of validity, evidence for discriminant validity was supported by the absence of a statistically significant correlation between hypomentalizing (RFQ-8) and FAD ($r = .04$, $p = .140$).

Bivariate Analyses

The means, standard deviations, and correlations of the key variables and covariates are shown in Table 2. Correlation coefficients showed a negative association between age and sex ($r = –.11$), years of education ($r = –.11$), suicidal ideation ($r = –.07$), hypomentalizing ($r = –.26$), and self-harm ($r = –.36$); as well as a positive association with SA lethality ($r = .13$). This result indicated that younger patients were associated with female sex, more suicidal ideation, self-harm, and hypomentalizing, whereas older patients presented higher SA lethality. Female sex was associated with a greater presence of suicidal ideation ($V = .08$), hypomentalizing ($r = .14$), and self-harm ($V = .08$), although the effect sizes for these associations were relatively small. Suicidal ideation was positively related to FAD ($r = .16$) and hypomentalizing ($r = .13$), albeit the strength of both associations was also small. Self-harm was associated with hypomentalizing ($r = .24$), was poorly related to FAD ($r = .09$), and was negatively and weakly related to SA lethality ($r = –.06$). This result means that individuals who engaged in self-harm had higher FAD levels, tended to hypomentalize, and had lower SA lethality. Moreover, a moderate-large magnitude of the relationship between age and self-harm was found ($r = –.36$). Lastly, FAD was positively associated, although weakly, with SA lethality ($r = .06$), which implies that higher levels of FAD were related to higher SA lethality. The interpretation of these associations is consistent with our secondary hypothesis.

Table 1

Mean Comparison of Socio-Demographic, Clinical Variables, Fearlessness About Death, and Hypomentalizing, in Low and High SA Lethality, and Presence or Absence of Self-Harm Groups for the Entire Sample (n = 1,371)

	Low SA lethality *n* = 539	High SA lethality *n* = 832	*p*	Effect size	Absence of self-harm *n* = 808	Presence of self-harm *n* = 563	*p*	Effect size
Sociodemographics								
Age, *M* (*SD*)	**38.7 (15.7)**	**41.9 (15.4)**	**≤ .001**	**–0.21** [a]	45.3 (15.2)	34.0 (13.5)	≤ .001	**0.83**
Female sex, *n* (%)	392 (72.7)	571 (68.6)	.105	0.04 [b]	**543 (67.2)**	**420 (74.6)**	**.003**	**0.08**
Years of education, *M* (*SD*)	12.0 (3.5)	11.8 (4.0)	.498	0.10 [a]	11.8 (3.9)	12.0 (3.6)	.171	–0.08
Married, *n* (%)	123 (22.8)	180 (21.6)	.605	0.01 [b]	**214 (26.4)**	**89 (15.8)**	**≤ .001**	**0.13**
Employed, *n* (%)	220 (41.2)	332 (39.9)	.660	0.01 [b]	337 (41.7)	215 (38.1)	.192	0.04
Clinical variables								
Suicidal Ideation, *n* (%)	**406 (75.3)**	**689 (82.8)**	**≤ .001**	**0.09** [b]	633 (78.3)	462 (82.1)	.091	0.05
Self-harm, *n* (%)	236 (43.8)	327 (39.3)	.099	0.04 [b]	---	---	---	---
ACSS-FAD, *M* (*SD*)	**17.8 (6.7)**	**18.8 (6.4)**	**.007**	**–0.15** [a]	**17.9 (6.5)**	**19.1 (6.5)**	**.001**	**–0.18**
RFQ-8, *M* (*SD*)	4.7 (1.3)	4.6 (1.3)	.087	0.10 [a]	**4.3 (1.3)**	**5.0 (1.2)**	**≤ .001**	**–0.57**

Note. SD: standard deviation. *n*: number of participants. Missing data for: Employed = 7; Acquired Capability for Suicide Scale-Fearlessness About Death (ACSS-FAD) = 26; Reflective Functioning Questionnaire (RFQ-8) = 26. [a] Cohen's *d*; [b] Cramer's *V*. Bold font indicates significant level at $p < .05$.

Table 2

Means, Standard Deviations, and Correlations Analysis Among Socio-Demographic and Clinical Variables for the Entire Sample (n = 1,371)

Variables	*M*	*SD*	1	2	3	4	5	6	7
1. Age	40.6	15.6							
2. Sex	0.7	0.5	**–.11** [c] **p < .001**						
3. Years of education	11.9	3.3	**–.11** [a] **p < .001**	.03 [c] *p* = .319					
4. Ideation	0.8	0.4	**–.07** [c] **p = .012**	**.08** [d] **p = .003**	–.03 [c] *p* = .257				
5. ACSS-FAD	18.4	6.5	.001 [a, e] *p* = .960	.03 [c, e] *p* = .286	–.05 [a, e] *p* = .077	**.16** [c, e] **p < .001**			
6. Hypomentalizing	4.6	1.3	**–.26** [a, e] **p < .001**	**.14** [c, e] **p < .001**	–.01 [a, e] *p* = .650	**.13** [c, e] **p < .001**	.04 [a, e] *p* = .140		
7. Self-harm	0.4	0.5	**–.36** [c] **p < .001**	**.08** [d] **p = .003**	.04 [c] *p* = .177	.05 [d] *p* = .091	**.09** [c, e] **p = .001**	**.24** [c, e] **p < .001**	
8. SA lethality	1.6	1.0	**.13** [a] **p < .001**	**–.06** [c] **p = .029**	.01 [b] *p* = .648	.04 [c] *p* = .113	**.06** [a, e] **p = .026**	–.05 [a, e] *p* = .062	**–.06** [c] **p = .027**

Note. SD: Standard deviation. ACSS-FAD: Acquired Capability for Suicide Scale-Fearlessness About Death. SA: Suicide Attempt. Bold fond indicates significant level at $p < .05$. [a] Pearson correlation coefficient. [b] Spearman correlation coefficient. [c] Point-biserial correlation coefficient. [d] Cramer's *V*. [e] *n* = 1,345.

Serial Multiple Mediation Analyses

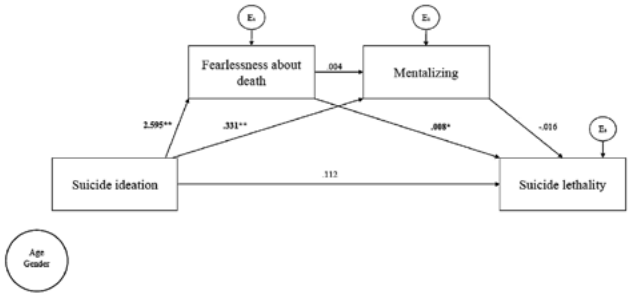
Figure 1 and Figure 2 show the regression weights between suicidal ideation, FAD, hypomentalizing, and SA lethality and self-harm. The results showed a relationship between suicidal ideation and both FAD and hypomentalizing as well as between FAD and SA lethality. The results also showed a relationship between self-harm and both FAD and hypomentalizing. Significant regression weights for covariates included age on hypomentalizing ($B = –.02$, $p < .001$), female sex on hypomentalizing ($B = .30$, $p = .001$), age on lethality ($B = .01$, $p < .001$), and age on self-harm ($B = –.05$, $p < .001$). We did not include years of education as a covariate in the serial multiple mediation models due to its low association with the rest of the variables.

The serial multiple mediation analysis revealed that the indirect effects between suicidal ideation and SA lethality through FAD were significant. Given that the direct effects in this mediation model were no longer statistically significant, FAD fully mediated the relationship between suicidal ideation and SA lethality. In addition, hypomentalizing and FAD also fully mediated the relationship between suicidal ideation and self-harm. Due to the sign of the effects, the mediation effect between FAD and hypomentalizing was determined to be competitive. Specific indirect effects did not show a higher effect of one of the mediators on the other; thus, the mediating effect was higher when mediators were performed separately in the association between suicidal ideation and self-harm. However, due to the weak relationship between FAD and hypomentalizing, the serial mediating effects of both variables were not significant. The total indirect effect, representing the sum or combination of mediations through both mediators, remained statistically significant. This result might suggest that while the mediators individually contribute to the indirect effect, their combination or interaction does not add up in an additive or synergistic manner to the total effect (see Table 3). The results are partially in line with our main hypothesis that exposure is not directly associated with both outcomes but instead

presents indirect effects through FAD and mentalizing; except for hypomentalizing in the association between suicidal ideation and SA lethality or when both mediators are presented together.

Figure 1

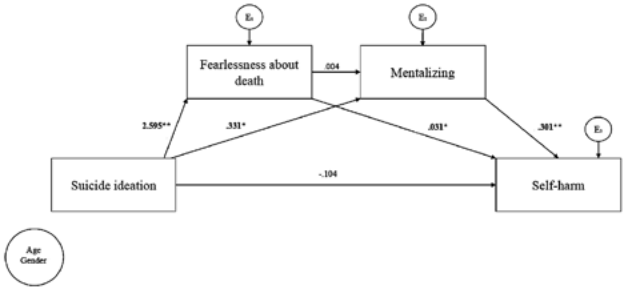
Diagram of Direct Effects in Serial Multiple Mediation Model Between Suicidal Ideation, Fearlessness About Death, and Hypomentalizing, Regarding SA Lethality, Controlled by Age and Sex



Note. Unstandardized regression coefficients presented. Bold font and * indicates significant level at $p < .05$ and ** indicates significant level at $p < .001$.

Figure 2

Diagram of Direct Effects in Serial Multiple Mediation Model Between Suicidal Ideation, Fearlessness About Death, and Hypomentalizing, Regarding Self-Harm, Controlled by Age and Sex



Note. Unstandardized regression coefficients presented. Bold font and * indicates significant level at $p < .05$ and ** indicates significant level at $p < .001$.

Table 3

Serial Multiple Mediation Model Results Among Suicidal Ideation as Exposure, Fearlessness About Death, and Hypomentalizing as Mediators, and Self-Harm and SA Lethality as Outcomes; Adjusted by Age and Sex

	B (*SE*)	Boot LL CI	Boot UL CI
SA lethality			
Total indirect effect	0.02 (0.01)	-0.01	0.04
A: ideation-FAD-lethality	0.02 (0.01)	0.001	0.04
B: ideation-hypomentalizing-lethality	-0.01 (0.01)	-0.02	0.01
C: ideation- FAD-hypomentalizing- lethality	-0.002 (0.00)	-0.001	0.00
Direct effect	0.11 (0.07)	-0.02	0.24
Self-harm			
Total indirect effect	0.18 (0.04)	0.11	0.27
A: ideation-FAD-self-harm	0.08 (0.03)	0.03	0.15
B: ideation-hypomentalizing-self-harm	0.10 (0.03)	0.04	0.17
C: ideation-FAD-hypomentalizing-self-harm	0.003 (0.004)	-0.004	0.01
Direct effect	-0.10 (0.157)	-0.41	0.20

Note. B: Unstandardized regression coefficients. *SE*: Standard error. CI: Confidence interval. FAD: Fearlessness About Death. SA: Suicide attempt. Analyses adjusted by age and sex. Bold font indicates significant effect at $p < .05$.

Discussion

The present study describes the differences by high or low SA lethality and by the presence or absence of self-harm in a sample of 1,371 participants who had attempted suicide. Addressing our secondary objective, we found that the distribution of participants in the high SA lethality group confirmed our hypotheses and was in line with previous research regarding older age (Liotta et al., 2015), a greater presence of suicidal ideation (Choo et al., 2019), and higher FAD (Krantz et al., 2022). In addition, regarding the presence of self-harm, the group differences were consistent with our hypotheses and the literature in terms of younger age (Rasmussen et al., 2016), higher proportion of females (Li et al., 2020), lower frequency of marriage (Øien-Ødegaard et al., 2021), higher FAD (Harris & Ribeiro, 2021), and higher hypomentalizing (Laghi et al., 2016). Regarding the bivariate analyses, our results demonstrated that older patients tended to engage in more lethal attempts. This result could be attributed to multiple factors in the elderly such as socio-economic changes, loneliness of the elderly, or health condition (Makara-Studzińska et al., 2021). We also found that younger participants showed more frequent self-harm behaviors and lower SA lethality, which is consistent with prior research (Gillies et al., 2018; González-Ortega et al., 2023). This outcome suggests that younger individuals might have committed self-harm as a maladaptive stress-release strategy (Rasmussen et al. 2016), which might mitigate SA lethality. The implications of these results could help clinical professionals identify profiles based on age and previous self-harm history. Contrary to expectations, we found very weak associations between our exposure variable, suicidal ideation, and either self-harm or SA lethality. Similarly, our results showed a statistically significantly higher rate of participants reporting suicidal ideation in the high SA lethality group, although the effect magnitude was also weak. Future studies should include groups of participants presenting with suicidal ideation and self-harm without a prior SA to further investigate the mechanisms underlying the transition from suicidal ideation to behavior.

The main objective of this study was to explore the mediating role of both FAD and hypomentalizing in the relationship between suicidal ideation with self-harm and SA lethality. This study is the first to show that FAD fully mediates the association between suicidal ideation and both self-harm and SA lethality. Our results are partially consistent with previous findings in this field as well as with our main hypothesis. Several studies have examined the role of the components of the IPTS in suicidal behavior. Consistent with our results, several studies have also associated FAD with high SA lethality (Chu et al., 2017; Krantz et al., 2022; Ribeiro, Witte, et al., 2014). The IPTS explains that suicidal behavior occurs when FAD is accompanied by suicidal desire due to thwarted belongingness (Chu et al., 2017); therefore, social failure is decisive in this regard. Other components of the IPTS have recently been found to be associated with suicidal ideation (Poindexter et al., 2022), which is congruent with our results. However, FAD has recently failed to mediate the association between self-harm and SA longitudinally (Harris & Ribeiro, 2021), suggesting that FAD levels might change during follow-up. Hence, early interventions focused on stopping the feelings of thwarted belongingness could contribute to reducing FAD levels, the risk of suicidal behavior or non-suicidal self-harm, and decreasing SA lethality.

Likewise, this study also provided the first evidence that hypomentalizing positively mediates the relationship between suicidal ideation and self-harm, which is congruent with our proposed model based on a recent review (Nestor & Sutherland, 2022). This result implies that hypomentalizing might increase the risk of self-harm, which is in line with recent findings (Badoud et al., 2015; Kennedy-Turner et al., 2023). The result also suggests that social cognition, specifically mentalizing, is crucial for understanding and coping with both external and internal potential stressful stimuli and allowing for the prevention of maladaptive reactions such as self-harming behaviors. In this context, previous studies have reported the mediating role of hypomentalizing in the association between childhood trauma and the number of SAs in a lifetime (Andreo-Jover et al., 2024). This finding suggests a potential explanatory mechanism for the relationship between hypomentalizing and self-harm observed in the present study. In contrast, other studies, such as those by Dickhoff et al. (2021), have observed better theory of mind task performance among individuals with prior suicidal ideation, compared with those without it, so findings in this regard remain inconsistent. Future research on the association between social cognition and suicidal behavior could help elucidate the associated factors and identify potential therapeutic actions. Several studies have recommended the benefits of MBT in reducing suicidal behavior by improving interpersonal abilities (Fuggle et al., 2023; Greiner et al., 2022; Griffiths et al., 2019). In contrast to what was anticipated, FAD and mentalizing did not jointly mediate the association between suicidal ideation and SA lethality or self-harm, and no association between them was observed. Following a review of IPTS, only the interaction between thwarted belongingness, perceived burdensomeness, and FAD was significantly related to a greater number of prior suicide attempts (Chu et al., 2017); thus, it appears that more complex mechanisms, such as social context, could play a role in this interaction. Future studies might consider assessing the relationship between mentalizing and thwarted belongingness or perceived burdensomeness.

This study has several limitations. First, we used the ACSS-FAD and RFQ-8 questionnaires, which are self-reported assessment methods that increase the risk of a common method bias. Moreover, although the internal consistency of the FAD subscale was optimal in this sample, previous studies have achieved results below the acceptable range for this questionnaire (Cronbach's alpha = .67) (Van Orden et al., 2008). Recent RFQ validation studies have criticized the instrument's psychometric properties (Müller et al. 2022). Some studies propose the exclusion of two items supporting the use of the RFQ-6, which has demonstrated higher internal consistency in adolescent (Bizzi et al., 2022) and adult samples (Spitzer et al., 2021). In addition, a recent systematic review questioned the clinical utility of ACSS (Schmeckenbecher et al., 2023). Therefore, using validated observer-rated measures of hypomentalizing and FAD might enhance the robustness of our findings. Second, we did not include control participants in the current sample of this work. The inclusion of controls would enable a more meaningful comparison between hypomentalizing and FAD levels. Third, our analyses did not account for potential confounders such as ethnicity, intelligence quotient, substance use, previous and current mental health treatment, prior mental health history, or participants' socioeconomic income. Inclusion of these factors could enhance the accuracy of our analyses, improve sample representativeness, and enable associations with clinical variables. Lastly, the cross-sectional design of the current study and the retrospective measurement of one of the main outcomes (i.e., lifetime self-harm) led to postdictive predictions, preventing us from making valid causal inferences regarding this variable. To address this limitation, the current ongoing project employs a longitudinal design that provides a one-year follow-up measure of suicidality and social cognition after the baseline. Several authors have highlighted the importance of this approach in assessing the evolution of FAD and hypomentalizing it over time (Cwik et al., 2020; Derks et al., 2019; Gervinskaitė-Paulaitienė et al., 2023), given that the risk of reattempt increases after the first SA (De la Torre-Luque et al., 2023).

This study analyzed the association between suicidal ideation and both self-harm and SA lethality through FAD and hypomentalizing. Our results suggest that FAD is a relevant factor in the relationship between suicidal ideation and self-harm and SA lethality, and that hypomentalizing also plays an important role in the association between suicidal ideation and self-harm. However, we did not find that both variables acted simultaneously as mediators in any of the multiple serial mediation analyses. There might be complexities in the relationship between mediators that result in their combined effect not being as strong as anticipated. These findings have implications for the clinical management of patients who present with suicidal ideation or behavior by considering their perceived social support and social cognition. This study could contribute to the Interpersonal Theory of Suicide concerning suicidal behavior development through FAD and hypomentalizing. Further research is needed using additional validated instruments for perceived social support and social cognition. Additionally, new models that account for other important variables, such as medication and patient diagnosis, should be explored. It is also essential to recruit a larger sample, including a control group, to improve the generalizability of the findings.

Author Contributions

Jorge Andreo-Jover: Conceptualization, Methodology, Writing - Original Draft, Writing - Review and Editing. **Eduardo Fernández-Jiménez:** Conceptualization, Methodology, Writing - Original Draft, Writing - Review and Editing, Corresponding Author. **Julio Bobes:** Supervision, Writing - Review and Editing. **Ana Isabel Cebria:** Supervision, Writing - Review and Editing. **Benedicto Crespo-Facorro:** Supervision, Writing - Review and Editing. **Alejandro De la Torre-Luque:** Supervision, Writing - Review and Editing, Data curation. **Marina Díaz-Marsa:** Supervision, Writing - Review and Editing. **Adriana García-Ramos:** Recruitment, Writing - Review and Editing. **Iria Grande:** Supervision, Writing - Review and Editing. **Ana González-Pinto:** Supervision, Writing - Review and Editing. **Luis Jiménez-Treviño:** Supervision, Writing - Review and Editing. **Natalia Roberto:** Recruitment, Writing - Review and Editing. **Miguel Ruiz-Veguilla:** Supervision, Writing - Review and Editing. **Ángela Palao-Tarrero:** Supervision, Writing - Review and Editing. **Víctor Pérez-Sola:** Supervision, Writing - Review and Editing, Coordination.

Acknowledgements

The authors would like to thank all participants for consenting to the use of their data and the following SURVIVE consortium researchers for their contribution to data collection: Katia B. March, Javier Curto-Ramos, Miguel Velasco, María Fe Bravo-Ortiz, Beatriz Orgaz, Eduard Vieta, Mireia Vázquez, Diego J. Palao, L. Comendador, J. Punti, M.T. Muñoz, José Luis Ayuso-Mateos, Itziar Leal-Leturia, Carla Pérez-Guerra, Paula Arias-Rodríguez, I. Pérez-Díez, E. Lara, María Teresa Bobes-Bascarán, Pilar A. Sáiz-Martínez, Elisa Seijo-Zazo, J. Fernández-Fernández, A. García-Fernández, Clara Martínez-Cao, J. Rider, Manuel Canal-Rivero, P. Reguera, M. Puertas, Elena García-Ligero, Pablo Mola, María Dolores Sáiz-González, José Luis Carrasco, Mahmoud Karim Haidar and María Purificación López-Peña.

Funding

This work was supported by the Instituto de Salud Carlos III (ISCIII) grant number: PI19/00941 and PI19/01027 (SURVIVE), S2022/BMD-7216 AGES 3-CM, S2017/BMD-3740 AGES-CM2-CM, PI23/01469 (SURVIVE II); and co-funded by the European Union grant numbers: COV20/00988, PI17/00768, PI20/01113, Horizon 2020 research and innovation programme Societal Challenges (grant number: 101016127), the Fundación Española de Psiquiatría y Salud Mental, the Government of the Principality of Asturias PCTI-2021-2023 IDI/2021/111, the Fundación para la Investigación e Innovación Biosanitaria del Principado de Asturias (FINBA), and Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM).

IG thanks the support of the Spanish Ministry of Science and Innovation (MCIN) (PI23/00822 y PI19/00954) integrated into the Plan Nacional de I+D+I and cofinanced by the ISCIII-Subdirección General de Evaluación y confinanciado por la Unión Europea (FEDER, FSE, Next Generation EU/Plan de Recuperación Transformación y Resiliencia_PRTR); the Instituto de Salud Carlos III; the CIBER of Mental Health (CIBERSAM); and the Secretaria d'Universitats I Recerca del Departament d'Economia I Coneixement (2021 SGR 01358), CERCA Programme / Generalitat de Catalunya as well as the Fundació Clínic per la Recerca Biomèdica (Pons Bartran 2022-FRCB_PB1_2022).

Declaration of Interests

IG has received grants and served as consultant, advisor, or CME speaker for the following identities: ADAMED, Angelini, Casen Recordati, Esteve, Ferrer, Gedeon Richter, Janssen Cilag, Lundbeck, Lundbeck-Otsuka, Luye, SEI Healthcare, and Viatris outside the submitted work. She also received royalties from Oxford University Press, Elsevier, and Editorial Médica Panamericana. PS has been a consultant to and/or has received honoraria or grants from Adamed, Alter Medica, Angelini Pharma, CIBERSAM, Ethypharm Digital Therapy, European Commission, Government of the Principality of Asturias, Instituto de Salud Carlos III, Janssen-Cilag, Lundbeck, Otsuka, Pfizer, Plan Nacional Sobre Drogas, and Servier.

Data Availability Statement

The dataset was not available because of the coordination rules of our national multisite study.

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