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Basic psychological needs and suicidal ideation: testing an integrative model in referred and non-referred adolescents

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Abstract
This study tested an integrative model linking experiences of need frustration and need satisfaction with suicidal ideation through a risk-enhancing (via anxious-depressive symptoms) and a risk-reducing pathway (via positive cognitions) in adolescents. The generalizability of the model based on the clinical status of the participants was also explored. A matched sample of referred ($n=210$) and non-referred ($n=210$) adolescents aged between 12 and 17 years old completed self-report measures of psychological need-based experiences, suicidal ideation, positive cognitions, and anxious-depressive symptoms. Structural equation modeling was used to explore the proposed model. Mediation analysis showed that need frustration was positively associated with suicidal ideation through anxious-depressive symptoms, while need satisfaction was negatively associated with suicidal ideation through positive cognitions. Invariance analysis pointed to limited differences in the model associations as a function of clinical status. These initial findings suggest the relevance of consider need frustration and need satisfaction in explaining suicidal ideation. The integration of risk and protective factors and the study of the generalizability of the data across the clinical status of adolescents provide preliminary implications for the development of interventions to prevent suicidal ideation.

Keywords Basic psychological needs · Suicidal ideation · Self-Determination Theory · Adolescence

Introduction

Suicide is considered a worldwide critical health issue. According to the World Health Organization (WHO, 2021), more than 700 000 persons commit suicide each year. In the adolescent population, suicide is highly prevalent (Franklin et al., 2017), being the second leading cause of death among youth globally (Roh et al., 2018). The prevalence of suicidal ideation is also particularly high during these years, with rates of up to 20% (Campisi et al., 2020). Considering that suicide attempts and suicide are usually preceded by suicidal thoughts (Joiner, 2005; Nock et al., 2008), an extensive effort has been devoted to identify factors associated with suicidal ideation (e.g., Ati et al., 2021; Guzmán et al., 2019). Traditionally, research has focused on the study of risk factors (e.g., symptoms of anxiety and depression; Nock et al., 2013), and more recently, there has been a growing interest in those factors that can play a protective role (e.g., positive cognitions; Huffman et al., 2014). Although risk and protective factors coexist in natural contexts, few studies have considered their combined role in predicting suicidal ideation. Further, from a preventive standpoint, identifying the processes that underlie these risk and protective factors associated with suicidal ideation is crucial. The primary contribution of the present study is then to explore the role of individuals' basic psychological needs for autonomy, competence, and relatedness as a critical process that helps to shed light on the etiology of suicidal ideation in adolescents. In a heterogeneous sample of referred and non-referred youth, we sought to test an integrative process model linking experiences of need satisfaction and

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frustration with suicidal ideation through a risk-enhancing (i.e., anxious-depressive symptoms) and a risk-reducing pathway (i.e., positive cognitions).

Basic psychological needs

Self-Determination Theory (SDT; Ryan & Deci 2017; Vansteenkiste et al., 2020) is an organismic and motivational macro-theory that assumes that we are naturally inclined to seek growth and wellness under supportive circumstances while also being vulnerable to passivity, defensiveness, and problem behaviors when critical psychological nutrients are lacking or actively deprived (Vansteenkiste & Ryan, 2013; Vansteenkiste et al., in press). To account for both the 'bright' and 'dark' sides of human functioning, SDT posits the basic psychological needs for autonomy, relatedness, and competence. When individuals have these needs met, they experience a sense of willingness, volition, and authenticity (autonomy satisfaction), feel effective and capable in their actions (competence satisfaction), and feel genuinely connected and cared for by significant others (relatedness satisfaction). In contrast, when these needs get frustrated, individuals feel controlled and pressured (autonomy frustration), experience a sense of failure (competence frustration), and feel socially excluded and lonely (relatedness frustration). Dynamics of need satisfaction and frustration must be studied separately, as lack of need fulfillment does not imply, by definition, that basic needs are frustrated. Indeed, several studies have demonstrated the specific contribution of need frustration, rather than the unfulfillment of need satisfaction, to ill-being and psychopathology (e.g., Ryan et al., 2016; Vansteenkiste & Ryan, 2013).

A large body of research in diverse age groups has confirmed the key role of basic psychological needs for individuals' psychological health (Vansteenkiste et al., 2020). In adolescents, need satisfaction was found to predict several indicators of well-being, including positive affect and life satisfaction (Rodríguez-Meirinhos et al., 2020), while need frustration relates to maladjustment, including problem behaviors (Van Petegem et al., 2015), stress (Campbell et al., 2020), and negative affect (Vandenkerckhove et al., 2019). Furthermore, need-based experiences predict adolescents' mental health (e.g., Brenning et al., 2015), with these need-based dynamics being critical across adolescents' age, gender (Rodriguez-Meirinhos et al., 2020), and clinical status (Brenning et al., 2022).

Overall, these robust findings confirm the essentiality of need dynamics but also its pervasiveness (Vansteenkiste et al., 2020). Yet, while need-based dynamics yield importance for a wide range of outcomes, their role as a basic principle concerning suicidal ideation is still underexplored.

Need-based Experiences and suicidal ideation

Although the work on the linkage between basic needs and suicidal ideation is still in its infancy, previous lines of research from the general suicide literature and the SDT perspective have provided initial evidence for their associations.

First, within the general literature, it is remarkable how different theoretical models focused on the emergence of suicidal ideation have equally emphasized the role of thwarted needs. For instance, the psychache theory (Shneidman, 1993) considers suicidal behavior, including suicidal ideation, as the product of intolerable psychological pain (i.e., psychache) that arises when the person fails to have some psychological needs met, such as the need for control, achievement, and affiliation, which shares some conceptual similarities with, respectively, the basic need for autonomy, competence, and relatedness. Along similar lines, the Interpersonal Theory of Suicide (ITS; Joiner 2005; Van Orden et al., 2010) suggests that the precipitant of suicidal ideation is the simultaneous experience of perceived burdensomeness and thwarted belongingness, two interpersonal constructs that are akin to the notions of frustrated competence and relatedness, respectively (Hill & Pettit, 2013). These theoretical claims have received some evidence, with loneliness (conceptually related to relatedness frustration) being established as a notably important predictor of suicidal ideation (McClelland et al., 2020). Other constructs related to autonomy frustration that have also received attention are limited autonomy and locus of control, with several studies (e.g., Bodner et al., 2006; Nelson & Singg, 1998) supporting a strong association with suicidal ideation. Finally, feelings of worthlessness and ineffectiveness (conceptually related to competence frustration) have also been postulated as predictors of suicidal ideation in several populations (Ulusoy & Demir, 2005; Wakefield & Schmitz, 2016).

The second line of research that provides evidence for the role of basic needs comes from the SDT-literature itself. Specifically, some research has shown that need satisfaction is negatively associated with suicidal ideation (Britton et al., 2014; Liu et al., 2020; Rowe et al., 2013; Tucker & Wingate, 2014). Other studies have explicitly focused on the moderating role of need satisfaction in the relationship between exposure to adverse and stressful situations (e.g., interpersonal conflicts or extreme supervision at work) and suicidal ideation. These studies found that people high on need satisfaction who experience negative life events are less likely to report suicidal ideation, suggesting that need satisfaction may serve as a buffer (Bureau et al., 2012; Rowe et al., 2013).

Altogether, the limited literature in this area has suggested that need satisfaction seems to protect against the

emergence of suicidal thoughts. However, no study from the SDT framework has formally explored the association between need frustration and suicidal ideation. Given that need frustration is linked to the emergence of psychopathology (Ryan et al., 2016), it is of utmost importance to study both need satisfaction and frustration to gain a complete understanding of their role in predicting suicidal ideation.

Anxious-depressive symptoms and positive cognitions as explanatory processes

Although previous research found some support for a link between need-based experiences and suicidal ideation, the mechanisms underlying this relationship are not fully understood. Congruent with the dual nature of basic needs, we propose two different pathways, with anxious-depressive symptoms and positive cognitions playing a unique and differential explanatory role (i.e., mediator) in the hypothetical associations between need-based experiences and suicidal ideation.

On the one side, we posit anxious-depressive symptoms as a possible explanatory mechanism in the association between need frustration and suicidal ideation. Past research has convincingly shown that the active frustration of basic needs is related to the appearance of anxious-depressive symptoms (Longo et al., 2016). Meanwhile, these symptoms were found to be one of the main risk predictors for suicidal ideation (Klein et al., 2005; Rodriguez & Kendall, 2014), especially among clinically referred adolescents (Liu et al., 2006). Further, the proposed explanatory role of anxious-depressive symptoms got some initial confirmation in previous studies, which found these symptoms to explain the link between distal risk factors (e.g., loneliness, denoting relatedness frustration; McClelland et al., 2020) and suicidal ideation.

On the other side, we posit positive cognitions (i.e., thoughts about confidence in one's abilities, happiness in the present moment, and confidence in future goals; Osman et al., 2003) as a possible explanatory mechanism in the association between need satisfaction and suicidal ideation. The available evidence has highlighted positive cognitions as an important proximal protective factor for suicidal ideation in clinical and non-clinical adolescents (Chung et al., 2012; Osman, 2002). Although no study to date has explored the link between need satisfaction and positive cognitions, these kinds of thoughts have been established as a marker of psychological well-being (MacLeod & Moore, 2000), a construct extensively linked to the satisfaction of basic psychological needs (e.g., Rodríguez-Meirinhos et al., 2020). Therefore, the proposed mediating mechanism and the relationship between need satisfaction and positive cognitions deserves more attention.

The present study

Although an extensive body of research has contributed to the identification of risk and protective factors for suicidal ideation, there remains a need for more integrative studies based on a clear theoretical framework that elucidate the complex interplay among these factors as well as the underlying mechanisms involved in the development of suicidal ideation. Rooted in the SDT framework, the purpose of the present study was to explore an integrative model by testing the unifying principle of basic psychological needs on suicidal ideation in a mixed sample of referred and non-referred adolescents. Specifically, we sought to examine the associations between satisfaction and frustration of the three basic psychological needs (i.e., autonomy, competence, and relatedness) and suicidal ideation while considering the mediating role of positive cognitions – as a protective factor – and anxious-depressive symptoms – as a risk factor. Additionally, we explored whether the overall associations are equivalent for referred and non-referred adolescents, allowing for a thorough understanding of these dynamics and the possibility of generalizing the findings across subsamples.

Based on theorizing, we hypothesize that need frustration will show a significant association with suicidal ideation, whereas the link between need satisfaction and suicidal ideation is more explorative (Hypothesis 1). Further, experiences of need frustration would be primarily related to anxious-depressive symptoms, while need satisfaction would be primarily related to positive cognitions (Hypothesis 2). Besides, we hypothesize that anxious-depressive symptoms would mediate the association between need frustration and suicidal ideation, while positive cognitions would mediate the association between need satisfaction and suicidal ideation (Hypothesis 3). Finally, considering the universal role of basic psychological needs, the clinical status is not expected to moderate the association between need-based experiences and any outcome in the proposed model (Hypothesis 4).

Method

Participants and procedure

Participants in the study included a matched sample of referred ($n = 210$) and non-referred ($n = 210$) adolescents. The referred group was recruited through 12 Mental Health Centers in the southern region of Spain. Participants in this group were selected based on gender (boys or girls), age range (12–14 or 15–17 years old), referral problem (internalizing problems, externalizing problems, or other problems, such as thoughts, attentional, or social problems), and

the educational level of the main caregiver (basic education, including primary, secondary, and medium vocational training degree; higher education, including high school, high vocational training degree, and university). Participants completed the questionnaire at the mental health facilities. The original sample included 230 adolescents. Of these, 20 were excluded because they did not complete one or more measures.

The non-referred group was comprised of 1405 adolescents recruited from 12 High Secondary schools located in the same municipalities as the Mental Health Centers. The schools were chosen based on the type of school (private or public), the population of the municipality (small municipalities: < 30 000 inhabitants; or big municipalities: ≥ 30 000 inhabitants), and the school district's annual average income (low-income districts: < 21 966 €; or high-income districts: ≥ 21 966 €). Participants filled out the questionnaires during school hours. To match the referred and non-referred groups, a matching procedure based on gender, age range, family structure, and family socioeconomic status (SES; measured by the Family Affluence Scale; Boyce et al., 2006) was followed, yielding a subgroup of 210 non-referred participants. Both groups do not differ in terms of the matching criteria (gender, $\chi^2(1)=0.00$, $p>.05$; age range, $\chi^2(1)=0.00$, $p>.05$; family structure, $\chi^2(3)=0.00$, $p>.05$; SES, $\chi^2(2)=0.00$, $p>.05$). Table 1 summarizes the main sociodemographic characteristics of the referred and the non-referred groups.

This study was approved by the Biomedical Research Ethics Review Board of Andalusia (Spain). Consent was obtained from adolescents and caregivers. On the consent form, information about the study objective, the procedure, and the confidentiality of the data was provided. The data collection was supervised by trained team members.

Table 1 Main Sociodemographic Characteristics of the Referred and the Non-Referred Groups

	Referred group ($N=210$)	Non-referred group ($N=210$)
Gender	90 boys, 120 girls	90 boys, 120 girls
Age	12–17 ($M=14.42$, $SD=1.64$)	12–17 ($M=14.60$, $SD=1.55$)
Spanish nationality	97.1%	96.2%
Family structure		
Two-parent families	70.0%	70.0%
Single-parent families	17.1%	17.1%
Reconstituted families	10.0%	10.0%
With other relatives	2.9%	2.9%
Family SES		
Low	21.9%	20.5%
Middle	52.9%	54.3%
High	25.2%	25.2%

Measures

Basic psychological need satisfaction and frustration

The 24-item Basic Psychological Need Satisfaction and Frustration Scale – child version (Chen et al., 2015; validated by Rodríguez-Meirinhos et al., 2020) was administrated to measure experiences of need satisfaction (12 items; four items per need, e.g., "I choose to do the things I do because I want to do them") and need frustration (12 items; four items per need, e.g., "I feel excluded from the group I want to be a part of"). Items were answered on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). Cronbach's alpha for need satisfaction and need frustration were 0.82 and 0.81, respectively.

Suicidal ideation and positive cognitions

The Positive and Negative Suicide Ideation Inventory (PANSI; Osman et al., 1998; validated by Villalobos-Galvis 2010) was administered to evaluate both suicidal ideation and positive cognitions. The 14-item scale included eight items measuring suicidal ideation (e.g., "During the past two weeks, including today, how often have you thought about killing yourself because you felt like a failure in life?") and six items measuring positive cognitions (e.g., "During the past two weeks, including today, how often have you felt hopeful about the future because things were working out well for you?"). All items were answered on a five-point Likert scale from 1 (none of the time) to 5 (most of the time). Cronbach's alpha for suicidal ideation and positive cognitions were, respectively, 0.95 and 0.84.

Anxious-depressive symptoms

Anxious-depressive symptoms were assessed using the Anxious/Depressed scale of the Youth Self Report (YSR; Achenbach & Rescorla, 2001). The scale includes 13 items (e.g., "I feel that no one loves me") answered on a Likert scale ranging from 0 (not true) to 2 (very true or often true). However, only 12 items were applied in this study, as we removed one item for methodological reasons as it measures suicidal ideation (i.e., "I think about killing myself"). Cronbach's alpha was 0.83.

Data management and model fit adjustment

Preliminary analyses were performed with SPSS version 26. SEM models were tested with Mplus 8.3. Little's (1988) missing completely at random (MCAR) test was not significant for the referred, $\chi^2/df=0.83$, $p>.05$, and the non-referred group, $\chi^2/df=1.45$, $p>.05$, indicating that the

Table 2 Means, Standard Deviations, and Correlations among Study Variables

	M	*SD*	1	2	3	4	5
1. Need satisfaction	4.03	0.60	-				
2. Need frustration	2.63	0.75	−0.52***	-			
3. Positive cognitions	3.46	0.94	0.60***	−0.49***	-		
4. Anxious-depressive symptoms	0.66	0.42	−0.39***	0.61***	−0.45***	-	
5. Suicidal ideation	1.56	1.00	−0.38***	0.50***	−0.47***	0.65***	-

***$p < .001$

Table 3 Means by Clinical Status, Gender, and Family Socioeconomic Status (SES)

	Clinical status		Gender		Family SES		
	Referred *M* (*SD*)	Non-Referred *M* (*SD*)	Boys *M* (*SD*)	Girls *M* (*SD*)	Low SES *M* (*SD*)	Medium SES *M* (*SD*)	High SES *M* (*SD*)
Need satisfaction	3.91 (0.66)	4.14 (0.52)	4.06 (0.61)	4.00 (0.60)	3.87 (0.72)	4.03 (0.57)	4.14 (0.54)
Need frustration	2.79 (0.78)	2.46 (0.68)	2.51 (0.70)	2.71 (0.77)	2.86 (0.82)	2.64 (0.74)	2.40 (0.62)
Positive cognitions	3.32 (0.98)	3.60 (0.87)	3.63 (0.90)	3.33 (0.94)	3.11 (0.87)	3.42 (0.94)	3.80 (0.88)
Anxious-depressive symptoms	0.77 (0.46)	0.55 (0.35)	0.56 (0.40)	0.73 (0.43)	0.77 (0.46)	0.65 (0.43)	0.59 (0.37)
Suicidal ideation	1.77 (1.15)	1.35 (0.77)	1.37 (0.80)	1.71 (1.11)	1.80 (1.12)	1.58 (1.04)	1.32 (0.70)

missing data were totally random. Therefore, full information maximum likelihood (FIML) was used.

Model fit was assessed with the χ^2/df ratio, the Root-Mean-Square-Residual (RMSEA), the Comparative Fit Index (CFI), and the Standardized Root Mean Square Residual (SRMR). An adequate fit was suggested by χ^2/df of 3 or less (Schermelleh-Engel et al., 2003), RMSEA of ≤ 0.06, CFI of ≥ 0.90, and SRMR of ≤ 0.08 (Kline, 2010). To test the invariance, we examined the chi-square difference test ($\Delta\chi^2$) and the change in CFI values of the nested model. Clinical status invariance was indicated by a non-significant $\Delta\chi^2$ or a $\Delta CFI < 0.01$ (Cheung & Rensvold, 2002).

Results

Preliminary analyses

Descriptive statistics and correlations among the study variables can be found in Table 2. The correlation between need satisfaction and need frustration was negative and significant. Further, need satisfaction was positively associated with positive cognitions and negatively with anxious-depressive symptoms and suicidal ideation. Need frustration yielded an opposing pattern of correlates. Finally, the association of positive cognitions with suicidal ideation was negative, whereas anxious-depressive symptoms were positively correlated with suicidal ideation.

Next, a MANOVA with clinical status, gender, age range, and family socioeconomic status (SES) as fixed factors was conducted to explore differences in the study variables. Results showed that referred adolescents scored higher on need frustration, $F(1, 378) = 17.10$, $p < .001$, $\eta^2 = 0.04$, anxious-depressive symptoms, $F(1, 378) = 24.52$, $p < .001$, $\eta^2 = 0.06$, and suicidal ideation, $F(1, 378) = 14.64$, $p < .001$, $\eta^2 = 0.04$, and scored lower on need satisfaction, $F(1, 378) = 14.57$, $p < .001$, $\eta^2 = 0.04$, relative to non-referred adolescents. Furthermore, girls scored higher on anxious-depressive symptoms, $F(1, 378) = 14.78$, $p < .001$, $\eta^2 = 0.04$, compared to boys. Finally, participants in the low SES group reported more need frustration, $F(2, 378) = 6.22$, $p = .002$, $\eta^2 = 0.03$, whereas those with higher SES reported more positive cognitions, $F(2, 378) = 12.09$, $p < .001$, $\eta^2 = 0.06$. No interaction effects were found. Table 3 shows the means and standard deviations of all the study variables by clinical status, gender, and SES. Based on these results, clinical status, gender, and SES were controlled in the main analyses.

Primary analyses

Measurement model

Study variables were modeled as latent variables using item parceling (Matsunaga, 2008). To guarantee model identification, three parcels of items per latent variable were created. The latent variables of need satisfaction and need frustration were modeled by three indicators that represent the satisfaction/frustration of each of the three needs. The latent variables of positive cognitions, anxious-depressive symptoms, and suicidal ideation were created through a random selection of items. Thus, the estimated measurement model included five latent variables and 15 indicators. This model fitted the data adequately, $\chi^2(80) = 182.98$, $p < .001$, RMSEA = 0.05, CFI = 0.96, SRMR = 0.04. All factor loadings ranged between 0.42 and 0.94 ($M = 0.75$) and were statistically significant ($p < .001$).

Direct effects model

We tested a SEM model including the association between need-based experiences and suicidal ideation. The covariation between need satisfaction and need frustration was modeled in this and all models because this relationship has been extensively documented in previous studies (e.g., Rodriguez-Meirinhos et al., 2020). The model (see Fig. 1) fitted the data well, $\chi^2(23) = 77.26$, $p < .001$, RMSEA = 0.07, CFI = 0.96, SRMR = 0.04. A positive association between need frustration and suicidal ideation was found, whereas the association between need satisfaction and suicidal ideation was not significant.

Mediation model

Before including positive cognitions and anxious-depressive symptoms as mediators, we conducted a model to investigate the association between need-based experiences and both proposed mediators. Model fit was adequate, $\chi^2(83) = 265.37$, $p < .001$, RMSEA = 0.07, CFI = 0.91, SRMR = 0.08. In the model, need satisfaction was related to positive cognitions ($\beta = 0.69$, $p < .001$), but unrelated to anxious-depressive symptoms ($\beta = -0.09$, $p = .48$). Contrary, need frustration was related to anxious-depressive symptoms ($\beta = 0.69$, $p < .001$), but unrelated to positive cognitions ($\beta = -0.11$, $p = .18$).

Next, we ran the mediation model by including positive cognitions and anxious-depressive symptoms as mediators in the relationship between need-based experiences and suicidal ideation. The data fit was good, $\chi^2(125) = 296.61$, $p < .001$, RMSEA = 0.05, CFI = 0.94, SRMR = 0.07. As shown in Fig. 2, both positive cognitions and anxious-depressive symptoms were associated with suicidal ideation, yet in opposite ways. Direct association of need satisfaction and need frustration with suicidal ideation turned out non-significant when adding the mediating variables. Further, the indirect associations between need satisfaction and suicidal ideation via positive cognitions ($\beta = -0.18$, $p = .01$) and between need frustration and suicidal ideation via anxious-depressive symptoms ($\beta = 0.49$, $p < .001$) were significant.

Invariance model

Finally, we analyzed the moderating role of clinical status in the proposed mediation model using multi-group SEM. Results showed that the constrained model (i.e., structural parameters of factor loadings, factor variances and covariances, and regression paths fixed) yielded an adequate fit, $\chi^2(185) = 354.04$, $p < .001$, RMSEA = 0.06, CFI = 0.94, SRMR = 0.12. However, the fit of the constrained model varied significantly from the fit of the unconstrained model (i.e., all parameters are freely estimated), $\Delta\chi^2(25) = 56.05$, $p < .001$, ΔCFI = 0.011. Therefore, the model was revisited in a stepwise fashion to find out which paths vary across both groups. No significant differences were found between the models (all $ps > 0.05$) except for the path from positive cognitions to suicidal ideation. Consequently, this constrained path was removed and the model was re-estimated. This final model showed that whereas positive cognitions were found to have a negative and significant association with suicidal ideation in the referred group ($\beta = -0.28$, $p < .01$), this relationship failed to be significant in the non-referred group ($\beta = -0.25$, $p > .05$). The fit of this model was not significantly different from the fit of the configural model, $\Delta\chi^2(19) = 25.68$, $p > .05$, ΔCFI = 0.02.

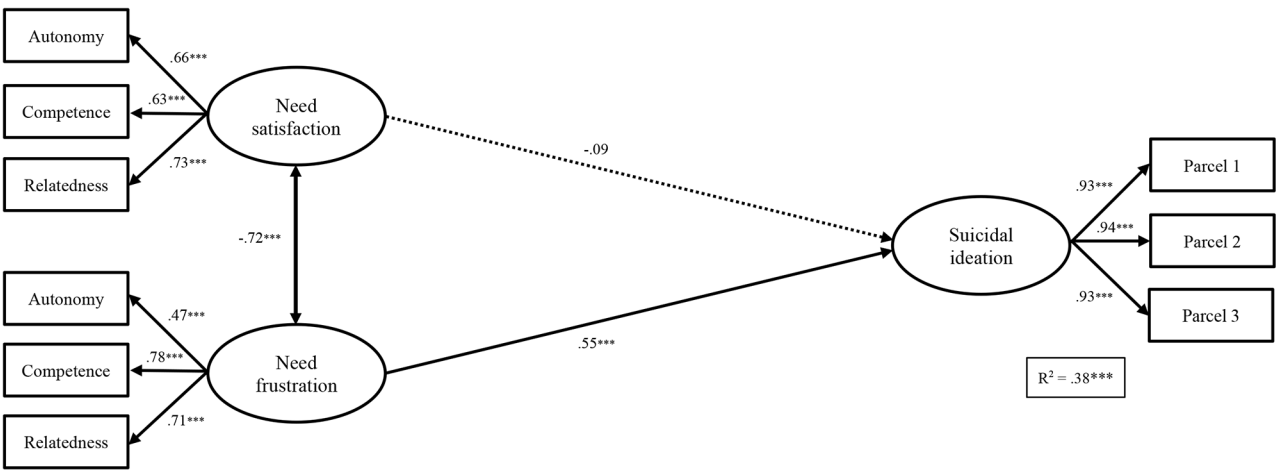

Fig. 1 Standardized path coefficients for the direct effects model. The dotted lines represent non-significant paths. ***$p < .001$

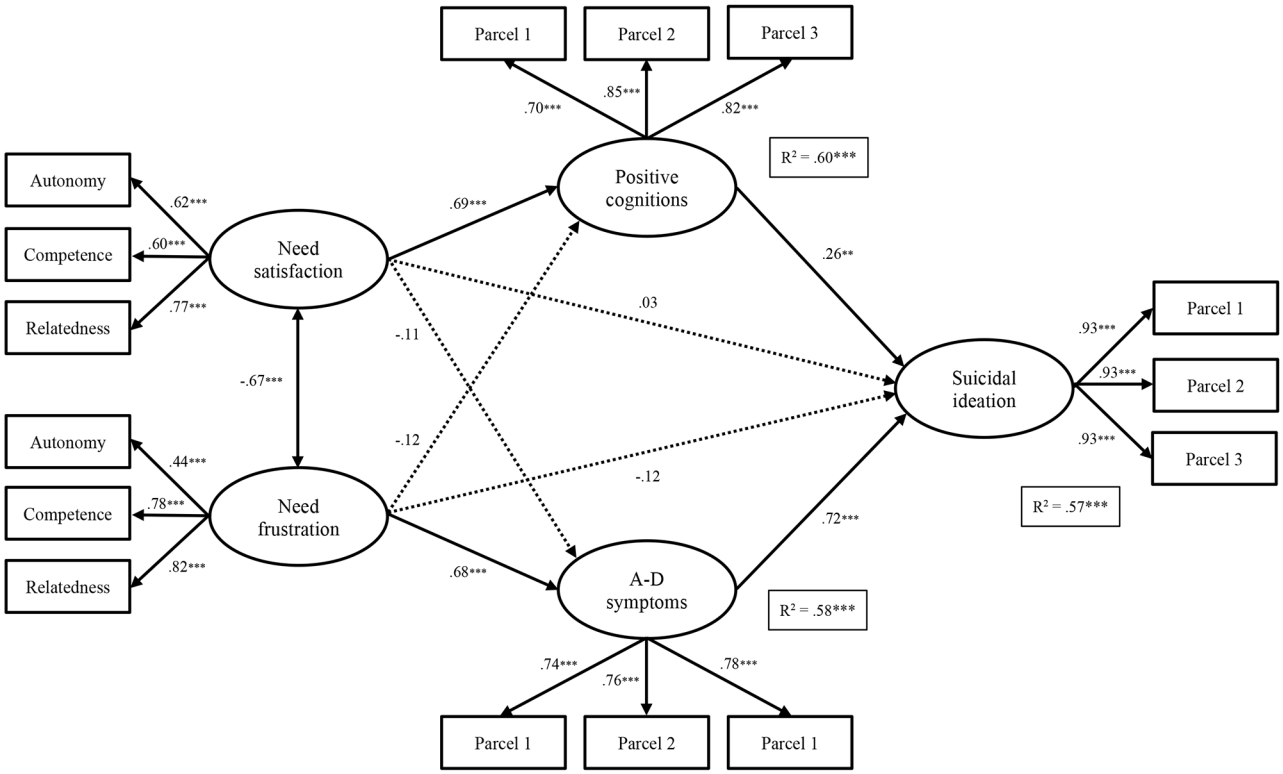

Fig. 2 Standardized path coefficients for the mediation model. The dotted lines represent non-significant paths. Note: A-D symptoms = Anxious-depressive symptoms. $^{**}p < .01$, $^{***}p < .001$

Discussion

Built on previous SDT and suicide research, the present study sought to test an integrative model that links psychological need-based experiences with suicidal ideation while considering the mediating role of anxious-depressive symptoms and positive cognitions. This work also explored the generalizability of the proposed integrative model across the clinical status of the participants using a matched sample of referred and non-referred adolescents.

Need-based experiences and suicidal ideation

The main contribution of this work was to examine the association between need-based experiences and suicidal ideation. According to Hypothesis 1, when experiences of need satisfaction and need frustration were allowed to compete in predicting suicidal ideation, only need frustration was found to matter. That is, when individuals had their basic psychological needs for autonomy, competence, and relatedness obstructed and undermined, they also experienced more thoughts about suicide. Although this is the first study that has explicitly explored the association between need frustration and suicidal ideation, several theoretical and empirical pieces of evidence have equally emphasized the role of frustrated needs in the occurrence of suicidal ideation across diverse populations (e.g., limited autonomy; Bodner et al., 2006; McClelland et al., 2020; Van Orden et al., 2010).

Unlike need frustration, need satisfaction was not found to have a significant relationship with suicidal ideation in our study. Although this finding may seem inconsistent with prior SDT-grounded work, which found need satisfaction to be inversely related to suicidal ideation (e.g., Rowe et al., 2013), none of these previous studies have considered the role of need frustration along with need satisfaction in the same explanatory model. According to SDT (Ryan et al., 2016) and in line with previous research (e.g., Vansteenkiste & Ryan, 2013), it is the active thwarting of basic needs rather than the unfulfillment of need satisfaction that is required for individuals' vulnerabilities, including their suicidal ideation, to come to the foreground. In sum, the current findings represent a new avenue to address suicidal ideation from the SDT framework, highlighting the relevance of exploring the role of need frustration on suicidal ideation more than the (dis)satisfaction of basic psychological needs.

The intervening role of anxious-depressive symptoms and positive cognitions

Another key question addressed in this study was to examine the role of anxious-depressive symptoms and positive cognitions as possible mediation variables in the association between need-based experiences and suicidal ideation. In line with Hypothesis 2, results showed that whereas need frustration was uniquely associated with anxious-depressive symptoms, need satisfaction was solely related to positive cognitions. These findings are in line with prior research that has stated that need satisfaction and need frustration should be studied as two distinct pathways (Chen et al., 2015; Verstuyf et al., 2013), with need frustration being the main predictor of maladjustment problems (Bartholomew et al., 2011) and need satisfaction being the primary predictor of more adaptative outcomes (Vansteenkiste & Ryan, 2013).

Congruent with Hypothesis 3, results showed that the association between need frustration and suicidal ideation was fully mediated by anxious-depressive symptoms. That is, need frustration did not directly predict suicidal ideation. Instead, this association was totally explained through the emotional cost (i.e., anxious-depressive symptoms, Ryan et al., 2016) associated with the frustration of basic needs. Consequently, these findings reveal the existence of a distal relationship between need frustration and suicidal ideation. This idea is congruent with past studies that have posited that need frustration not only has proximal relationships with maladjustment outcomes but could also maintain a more distal relationship through a sequence of intervening variables (Vansteenkiste et al., in press). Because this specific distal risk role of need frustration on suicidal ideation is novel in the literature, it is important to replicate the current findings in future research before drawing any firm conclusions.

Similarly, positive cognitions were found to completely mediate the relationship between need satisfaction and suicidal ideation. The intervening role of positive cognition suggests that, although need satisfaction did not have a direct association with suicidal ideation, it could play a buffering role. Apparently, those adolescents who have their basic psychological needs satisfied experience more hopeful thoughts about their abilities and personal situation. In turn, the equipment of this set of cognitions seems to confer protection against the emergence of suicidal ideation. Similar conclusions were drawn by previous studies that investigated the relationship between need satisfaction and suicidal ideation (Britton et al., 2014), which highlighted the buffer role of need satisfaction against these ideas through the promotion of positive outcomes (e.g., subjective well-being).

The role of clinical status

The last contribution of this work was to formally explore the generalization of the proposed integrative model in a matched sample of referred and non-referred adolescents. Considering the universality of basic psychological needs (e.g., Brenning et al., 2022), we hypothesized that the clinical status of the adolescents was not expected to moderate any of the previous associations (Hypothesis 4). Results showed that basic need experiences yielded a similar pattern of correlates in referred and non-referred youths, confirming the critical outcome of suicidal ideation and its precursors. By exception, the association between positive cognitions and suicidal ideation did vary across referred and non-referred adolescents. While positive cognitions were significant and negatively associated with suicidal ideation for referred youths, this relationship failed to be significant for non-referred. Accordingly, positive cognitions only explained the association between need satisfaction and suicidal ideation for referred adolescents.

A possible explanation for this non-significant pathway between positive cognitions and suicidal ideation in the non-referred group could be the protective nature of positive cognitions as such. According to Garmezy et al. (1984), protective factors can be defined as individual (or environmental) characteristics and behaviors that reduce the predictions of psychopathology based on an individual's at-risk status. Hence, protective factors only act as a buffer in the presence of risk sources. Considering that suffering from a mental health problem is a well-identified risk factor for suicidal ideation (Nock et al., 2012), it is possible that positive cognitions only have a protective role in the referred adolescents, as this is an especially at-risk population. However, given the speculative nature of this explanation, it is necessary to replicate this study to confirm these findings and their clinical implications.

Limitations and strengths

The present work has several limitations that must be highlighted. First, the cross-sectional design of the study data prevents one from drawing any conclusion about the direction of effects among the study variables. Furthermore, some studies have demonstrated that need-based experiences fluctuate on a daily basis, and that this variation is related to the daily fluctuation of certain pathologies (e.g., binge eating symptoms; Verstuyf et al., 2013). Given that levels of suicidal ideation also vary within short periods (Kyron et al., 2018), conducting longitudinal studies could confirm the direction of effects, thereby examining potential bidirectional relations between need-based experiences and suicidal ideation. Secondly, the assessment of the study

variables was based on self-report measures in both samples. While self-report measures can provide valuable information, they are subject to several potential biases that could affect the validity and reliability of the findings (e.g., social desirability or recall bias). Therefore, future research should include other measures for the outcome variables, such as external evaluations from parents or clinicians. Third, this work examines the contributory role of two well-recognized variables associated with suicidal ideation, specifically, anxious-depressive symptoms and positive cognitions. Yet, suicidal ideation is a complex and multifaceted disorder, influenced by numerous factors and resulting in a variety of outcomes. To better understand the association between need-based experiences and suicidal ideation, an important avenue for future research is to broaden the range of variables examined, particularly those with established connections to suicidal ideation as identified by previous studies, such as hopelessness (Wolfe et al., 2019) or immune system impairment (Serafini et al., 2020). Finally, another limitation of the study refers to the generalization of the data. More than children and adults, adolescents present higher rates of suicidal ideation (Franklin et al., 2017). However, it would also be relevant to replicate this study in other populations and age groups to confirm the generalizability of the findings.

Despite the aforementioned limitations, the study also has several strengths that should be noted. First, the present study offers a pioneering effort in examining the contribution of both need satisfaction and frustration on suicidal ideation. While previous studies have explored the specific role of need satisfaction, the incorporation of need frustration into our analysis represents a novel contribution to the literature. Second, the study builds on previous research claiming the importance of models that include both protective and risk factors to guide researchers and professionals toward a better understanding of suicidal ideation (e.g., Holman & Williams, 2022). Furthermore, the study sheds light on the underlying mechanisms that govern the relationships between need-based experiences and suicidal ideation. By identifying positive cognitions and anxious-depressive symptoms as mediating factors, we provide important insights that can inform future research and the development of evidence-based practices in the field of suicide prevention. Finally, the inclusion of a heterogeneous sample of referred and non-referred adolescents facilitates the generalizability of our findings by allowing a more nuanced application to diverse adolescent populations.

Conclusion

The evidence from the present study supports the value of the Self-Determination Theory (SDT) as a robust theoretical framework for improving our understanding of suicidal ideation in adolescents. The findings not only underscored the salience of need-based experiences in accounting for suicidal ideation but also revealed that these associations were mediated by well-established risk and protective factors for suicidal ideation. Specifically, the relationship between need frustration and suicidal ideation was mediated by anxious-depressive symptoms, whereas the association between need satisfaction and suicidal ideation was mediated by positive cognitions. These findings represent a significant contribution to the limited body of research on suicidal ideation from a SDT perspective and carry practical implications for clinicians. By designing interventions aimed at fostering need satisfaction and mitigating need frustration (i.e., need crafting interventions; Laporte et al., 2022), we could promote protective factors and reduce the emergence of risk factors in adolescents. Furthermore, the assessment of the study model in both referred and non-referred samples facilitates the applicability and generalizability of our findings, particularly in clinical settings where adolescents are at heightened risk for suicidal ideation. The results emphasize the importance of developing initiatives for the prevention of suicidal ideation in the general adolescent population but also of focusing on interventions targeted to clinically vulnerable individuals. These specific approaches can be integrated into comprehensive prevention strategies aimed at reducing the incidence of suicidal ideation in the adolescent population.

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Data Availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate All procedures involving human participants in this study were in accordance with the ethical standards of the Biomedical Research Ethics Review Board of Andalusia (Spain) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent to participate Informed consent was obtained from all participants included in the study and their parents.

Conflict of Interest The authors declare that they have no conflicts of interest.

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