




RESEARCH ARTICLE

# From Family Conflicts to Suicide Risk Through Deliberate Self-Harm Online Content in Adolescents and Young Adults

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**Introduction:** Family conflicts are considered a risk factor for deliberate self-harm (DSH) and even suicidal thoughts and behaviors. Research also shows that adolescents are increasingly engaging in online DSH activities. However, studies on this topic are scarce.

**Aims:** This study's first goal is to replicate the effect of family conflicts on suicidal ideation (SI) and, according to the gateway theory, include DSH diversity as a step preceding SI. Second, we aim to consider online activities in understanding suicidal risk. We start by describing online DSH activities, and propose a sequential mediation model in which family conflicts predict DSH and SI through online DSH activities.

**Methods:** The convenience sample of this cross-sectional study consisted of 357 adolescents and young adults between 12 and 22 years old who completed a self-report questionnaire measuring family conflicts, online DSH activities, identification with DSH-related content creators, DSH, and suicidal ideation.

**Results:** The results showed that 85.3% of our community sample used the internet for DSH-related purposes. Results also revealed an independent mediation effect of DSH diversity on the relationship between family conflicts and SI, and a sequential mediation effect of online DSH activities, identification, and DSH diversity.

**Conclusions:** Engaging in online DSH activities is only predictive of DSH or SI if adolescents perceive a shared identity with this community of creators. The findings might yield implications regarding the design of prevention strategies that include a further supervision of online platforms and psychological interventions that incorporate the family system and peers.

**Keywords:** adolescents, deliberate self-harm, suicidal ideation, family conflicts, online

## Introduction

### Deliberate Self-Harm, Family Conflicts, and Online DSH Activities

Deliberate self-harm (DSH) has become more prevalent in adolescents over the last decades (e.g., Gaspar et al., 2022; Hawton et al., 2012; Zetterqvist et al., 2021). Nationally, the prevalence of these behaviors among adolescents ranges between 7% and 40.8% (Duarte et al., 2020; Gaspar et al., 2022; Guerreiro et al., 2017; Nobre-Lima et al., 2017). DSH are non-fatal and self-aggressive behaviors, regardless of suicidal intent (Duarte et al., 2019; Gouveia-Pereira et al., 2022; Madge et al., 2008). These behaviors are often understood as part of a spectrum, arranged according to their severity (i.e., level of physical harm caused by each method of DSH), and according to the Gateway Theory, they might be an entry point to a wider spectrum of suicidal thoughts and behaviors (STBs)

(Grandclerc et al., 2016; Hamza et al., 2012). The diversity of these behaviors (i.e., number of DSH methods) and suicidal ideation (SI) (i.e., thoughts or willingness to commit suicide) is also a predictor of suicide attempts (SA) (Duarte et al., 2019; Duarte et al., 2020; Gouveia-Pereira et al., 2022; Hawton et al., 2012).

Regarding the predictors of these STBs, higher family conflict is one of the risk factors and major reasons, presented by young people, to engage in DSH (Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Nicolopoulos et al., 2018; O'Brien et al., 2021; Simes et al., 2022; Syed & Khan, 2008). Indeed, it is known that parent-adolescent disagreements and conflicts are a normal part of family relationships during the stage of adolescence, as they are necessary for the development of new boundaries within the family system, facilitating the adolescent's individuation, autonomy, and differentiation processes (Blos, 1979; Branje, 2018; Steinberg, 2001; Weymouth et al., 2016). However, when this disagreement is marked by fighting and aggression, or when too many conflicts arise, it may affect an adolescent's psychosocial adjustment and well-being (Branje, 2018; Weymouth et al., 2016). Indeed, some adolescents tend to internalize familial conflicts, leading to feelings of being guilty, unloved, and rejected, as well as beliefs of thwarted belongingness and perceived burdensomeness, contributing to considering engaging in DSH and STBs to escape these painful feelings (Kalpakci et al., 2014; Sands & Dixon, 1986).

Besides, when young people feel a lack of social and parental support and are unable to rely on the family system, a sense of belongingness can be searched for and supplemented in the online context (Gámez-Guadix, 2022). Moreover, the internet is a space where individuals can express thoughts, emotions and psychological distress that they have difficulty expressing in the real world (Adams et al., 2005; Bargh et al., 2002; Margherita & Gargiulo, 2018). Concerning DSH, research shows that some adolescents feel isolated, non-accepted, stigmatized, and ashamed of their behaviors, navigating online to find similar others to fulfill their support needs (Dyson et al., 2016; Lavis & Winter, 2020; Seko et al., 2015; Simone & Hamza, 2020). Online representations of these behaviors have been growing (e.g., Biernesser et al., 2020; Duggan et al., 2012; Dyson et al., 2016; Frost et al., 2016; Lee et al., 2022; Lewis et al., 2012; Marchant et al., 2017), and there are several possible online activities connected with DSH (i.e., viewing, creating, and sharing content related to DSH; talking online about these behaviors with online or offline peers). These activities can occur on different platforms, such as social media (e.g., Instagram), messaging applications (e.g., WhatsApp), video platforms (e.g., TikTok), and discussion forums (e.g., Reddit) (Adler & Adler, 2008; Baker & Fortune, 2008; Brown et al., 2018, 2020; Giordano et al., 2022; Lavis & Winter, 2020; Lewis & Seko, 2016; Logrieco et al., 2021; Nesi et al., 2021; Rodham et al., 2007; Whitlock et al., 2006). Worldwide, research has only recently started to highlight online DSH activities on contemporary and adolescents' popular social media (e.g., Instagram) (Arendt et al., 2019; Brown et al., 2018, 2020; Giordano et al., 2022; Nesi et al., 2021), and we found no national studies that focused on DSH-related internet use.

## Online DSH Activities, Identification with DSH-Related Content Creators, DSH Diversity, and Suicidal Ideation

A growing body of evidence has been showing that DSH online representations sometimes lead to imitation, contagion, social comparisons and competitions, normalization, triggering effects, reinforcement, DSH maintenance, and increased SI risk (Arendt et al., 2019; Baker & Lewis, 2013; Biernesser et al., 2020; Brown et al., 2020; Campaioli et al., 2017; Dyson et al., 2016; Jacob et al., 2017; Lewis & Baker, 2011; Lewis & Seko, 2016; Marchant et al., 2017; Nesi et al., 2021; Rodham et al., 2007; Seong et al., 2021; Zhu et al., 2016). Previous studies also indicate higher levels of suicidality in those who use the internet for suicide and DSH-related reasons (e.g., Bell et al., 2018; Frost & Casey, 2016; Lee et al., 2022; Seong et al., 2021).

Research has also suggested that sometimes online DSH activities or a DSH community culture resource integrate adolescents' identity, which can increase the risk of DSH, contribute to its maintenance and higher severity, as well as the risk of STBs (Adler & Adler, 2008; Campaioli et al., 2017; Jacob et al., 2017; Nesi et al., 2021; Sternudd, 2012). Indeed, adolescence is considered a critical period for identity development, which is formed through the process of belonging to and identifying with social groups (Tajfel & Turner, 1979). Therefore, some adolescents and young adults feel the need to increase the severity of their behaviors to gain the right to claim the self-injurer identity; otherwise, feelings of being rejected might emerge (Jacob et al., 2017; Sternudd, 2012). Prior studies have not addressed quantitatively the degree of young people's identification with DSH-related content creators, which might have a considerable impact on the relationship between online DSH activities, DSH, and SI in vulnerable adolescents and young adults. This seems particularly important since past studies have found differences in suicidality risk between those who only view DSH content and those who post their DSH content online, where posting content can be associated with an increased risk of suicide, while just passively viewing is not related to suicide risk - after considering other variables (Seong et al., 2021). Similarly, it is possible that those

who also identify themselves with DSH content creators, in search for a sense of belongingness, are at a higher risk on the continuum of suicidality than those who simply engage in online DSH activities, particularly when having a conflictual familial environment that does not satisfy these belongingness needs.

### The Current Study

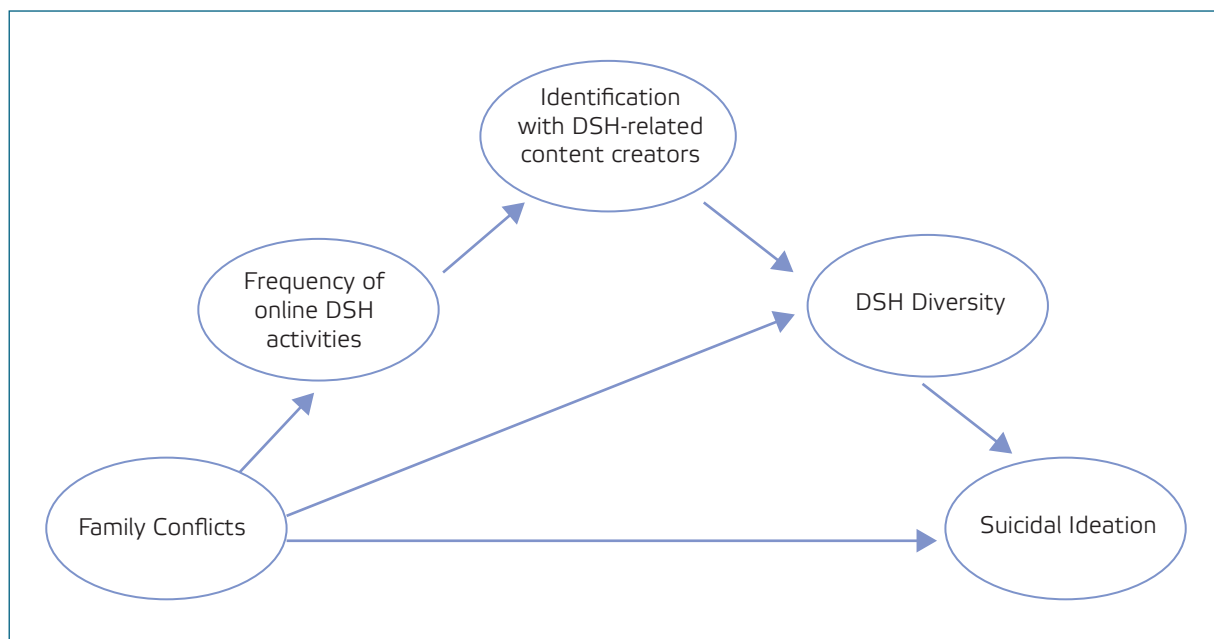
In line with the aforementioned, since the studies that focused on this topic are still scarce, particularly in Portugal, our first goal is to describe online DSH activities (viewing, creating, and sharing DSH online content; communicating online about DSH with people known online or offline) regarding their frequencies and the platforms used in a sample of adolescents and young adults (Objective 1).

Two more goals were defined and are further discussed. It is well established that family conflicts are a major predisposing risk factor, and underlying reason for engaging in DSH and STBs (e.g., Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Pelkonen & Marttunen, 2003; Syed & Khan, 2008). Furthermore, research has proved associations between DSH and SI (e.g., Andover & Gibb, 2010; Duarte et al., 2020; Grandclerc et al., 2016; Guan et al., 2012), with a greater number of DSH methods (DSH diversity) being associated with an increased likelihood of lifetime suicidality (Duarte et al., 2020; Seong et al., 2021). However, some authors suggest that these behaviors might be protective against suicide, proposing an anti-suicide model (Suyemoto, 1998). As this theoretical framework still exists, we intend to replicate the effect of family conflicts on SI through the mediating role of DSH diversity, testing the Gateway Theory (Objective 2).

Research shows that the family also has an important role in young people's online risks and internet use, as these people may rely on the internet to satisfy support and emotion regulation needs that may not be met within the family (Lin, 2020; Mesch, 2006; Sela et al., 2020; Wright et al., 2021). Likewise, adolescents missing family support may use DSH-related content to increase their perceived group belongingness (Gámez-Guadix et al., 2022). It has also been shown that online DSH activities are associated with an increased risk of suicidality, including SI (Arendt et al., 2019; Nesi et al., 2021; Seong et al., 2021), and sometimes may contribute to the development of a self-harmer identity, which can lead to an amplification of the behaviors (e.g., Jacob et al., 2017). Finally, previous findings show that DSH diversity is a strong predictor of SI (e.g., Duarte et al., 2020; Gouveia-Pereira et al., 2022). Hence, our third objective is to test the previously mentioned mediation model by adding the role of online DSH activities and identification with DSH-related content creators (Objective 3, see Figure 1).

While the literature is consensual about the family risk factors that influence suicidality, including family conflicts, this is the first study, as far as we know, that tests a model that encompasses the role of online DSH activities, identification with DSH-related content creators, and DSH diversity in this relationship.

Figure 1. The Proposed Mediation Model



## Method

### Participants

A total of 366 students from public and professional schools participated in this study. After removing incomplete and repetitive answers ( $n = 8$ ), and one participant who did not accept to participate, we composed our final sample including 357 adolescents and young adults (54.1% male;  $M_{\text{age}} = 16.61$ ,  $SD = 1.83$ ), mostly nationals (93.6%), who studied between the 7<sup>th</sup> and 12<sup>th</sup> grade, of whom 41.5% ( $n = 147$ ) reported at least one school retention. Most participants had a history of DSH: 50.9%, with a range from one to 13 DSH methods ( $M = 4.12$ ,  $SD = 3.14$ ). Despite being higher, the prevalence of young people in our sample reporting a previous history of DSH appears to be similar compared to community samples of other national studies using ICAL (e.g., 40.8%, Duarte et al., 2020; 33.9%, Gouveia-Pereira et al., 2022).

### Measures

#### *Family Conflict*

We used the national version of the Family Climate Inventory (FCI, Teodoro et al., 2009) to evaluate whether the relationship between parents and their children is aggressive, critical, or conflictual. Items (sample item: "People often criticize each other") were answered from 1 = *Totally disagree* to 7 = *Totally agree*. The Portuguese version (Teodoro et al., 2009) showed good levels of internal consistency ( $\alpha = .84$ ). In the current study, the measurement also presents good internal consistency ( $\alpha = .82$ ), and we computed a mean score by averaging the six items of the scale ( $M = 2.53$ ,  $SD = 0.89$ ).

#### *Online DSH Activities*

We developed the Online DSH Activities Questionnaire, a self-report measurement to test the frequency of the different online DSH activities. We started with a literature review (Lewis et al., 2012; Nesi et al., 2021) as well as consulting clinicians and researchers with expertise in working with adolescents with DSH. Five items questioned the frequency of viewing, sharing, and creating DSH-related content; talking online about DSH with peers also known offline, and talking online about DSH with peers only known online, which were answered on a five-point rating scale (from 1 = *Never* to 5 = *Everyday*). We carried out an exploratory factor analysis using the Maximum Likelihood factoring method with Promax rotation, and applying the Kaiser criteria to determine the number of factors. The analysis revealed a one-factor structure accounting for 41.7% of the variance, in which all items saturated (with all factor loadings greater than .52). The Kaiser-Meyer-Olkin test indicated sampling adequacy ( $KMO = .80$ ), and Barlett's test of sphericity corroborated the data's suitability for this analysis ( $p < .001$ ). We computed the online DSH activities index by means of averaging the five items ( $\alpha = .76$ ;  $M = 1.74$ ,  $SD = 0.64$ ). For each of the five items we asked the respondent which platforms they used for each activity (Instagram; TikTok; Facebook; Tumblr; Blogs; Forums; Reddit; WhatsApp; Telegram; Others), allowing the selection of more than one platform.

#### *Identification with DSH-Related Content Creators*

The Identification with DSH-related Content Creators Questionnaire is an adaptation based on the social identification scale developed by Palmonari et al. (1991) aimed at adolescents. Palmonari et al. (1991) used four identification scales, with five items each (answered from 1 = *Completely disagree* to 5 = *Completely agree*), measuring adolescents' identification with the peer group (sample item: "I feel close to my peer group"), the family (sample item: "I feel close to my family"), with the school mates (sample item: "I feel close to my school mates), and with the best friend (sample item: "I feel close to my best friend"). In the present study, we have modified these scales, using only a scale related to identifying with DSH-related content creators. For that purpose, we asked the respondents to answer five items regarding the people who create online DSH-related content they consume (sample item: "I feel close to these people"), changing the items used by Palmonari et al. (1991), so that our items could refer to the people who create online DSH content. The participants answered on a five-point rating scale

(from 1 = *Completely disagree* to 5 = *Completely agree*). We computed a final index from the mean of the five items ( $\alpha = .93$ ;  $M = 2.42$ ;  $SD = 1.07$ ).

### *Deliberate Self-Harm (DSH)*

The Inventory of Deliberate Self-Harm Behaviors (ICAL) is a self-report measure that was previously validated for Portuguese adolescents and indicated acceptable psychometric properties (Duarte et al., 2019). The participants were asked to indicate the lifetime frequency of 14 DSH behaviors (e.g., cutting, biting), with a four-option response format (“No”, “Yes – 1 time”, “Yes, 2–10 times”, “Yes, more than 10 times”). DSH diversity was ascertained after dichotomizing each DSH behavior (“0” for the absence of a lifetime history of the DSH method, “1” for the presence of a history of the DSH method) and summing all items.

### *Suicidal Ideation*

The Suicidal Ideation Questionnaire (SIQ, Ferreira & Castela, 1999; Reynolds, 1988) is a 30-item self-report measure that assesses the frequency of suicidal thoughts (from 0 = *I never had the thought* to 6 = *Almost every day*). The original version (Reynolds, 1988) revealed a very good level of internal consistency ( $\alpha = .97$ ), and good construct validity. The Portuguese version (Ferreira & Castela, 1999) showed a very good internal consistency ( $\alpha = .96$ ) and an alpha of .76 in the test-retest reliability. In the current study, this measurement has also presented an excellent level of internal consistency ( $\alpha = .98$ ). We computed an index with the sum of all items revealing a mean of 34.50 ( $SD = 43.45$ ), similar to the mean scores found in other studies using both a community and a clinical sample (e.g.,  $M = 34.35$ ,  $SD = 42.75$ , Duarte et al., 2020;  $M = 55.13$ ,  $SD = 48.18$ , Gouveia-Pereira et al., 2022).

### *Socio-Demographic Questionnaire*

The socio-demographic variables included sex, age, nationality, education (school year and the number of possible academic retentions), and others.

### *Procedure*

This study was approved by the ISPA-Instituto Universitário Ethics Committee in Lisbon, Portugal (Registry number: I-081-5-22). Before collecting the data, we did a qualitative pre-test with six adolescents in order to verify if the questionnaire was easily understood and if further issues were mentioned by these six respondents. After this moment, the team established contact with the schools, and the principals selected different classes by convenience. After the consent forms were signed by both legal guardians and students, the researchers carried out the data collection. Questionnaires were completed during school time (approximately 30 minutes). Considering the sensitive nature of the topic and since the Investigators did not have a protocol for intervening in cases of high scores on the SIQ measure, a final section was added to the survey with various helplines and community support contacts in Portugal for suicide and DSH.

### *Statistical Analysis*

Statistical analyses were performed using SPSS statistics and PROCESS macro for SPSS (version 4.1) (Hayes, 2022). To answer our first objective, descriptive statistics were carried out to explore the online DSH activities variables.

To test the mediation effects proposed in our second and third objectives, we started with conducting *Pearson* correlations between the variables of interest. We have checked the assumption of normal distribution using the Kolmogorov-Smirnov test, and the results revealed a non-normal distribution of all the variables ( $p < .001$ ). However, the results did not grossly violate the normality assumption as the absolute values for skewness and kurtosis did not exceed the recommended values of two and seven respectively (Kim, 2013; Kline, 2005), thus justifying the use of the analysis. We used Model 6 in the SPSS PROCESS Macro with bootstrapping 5000 simulations to examine the significance of the indirect effects, and 95%  $CI_{Boot}$  were provided. Importantly, a given effect was considered statistically significant if both the upper and lower bond of the CI were positive (entirely above zero) or negative (entirely below zero).



## Results

### Describing the Frequencies of Online DSH Activities

The results revealed that viewing DSH online content was the activity that most participants stated having engaged in, with only 20.9% of all participants reporting never viewing online DSH content (see Table 1). In Table 1 it is possible to see the average frequency with which participants engaged in each online DSH activity.

Table 1. Descriptive Statistics of Online DSH Activities

			Frequency				
			% selecting option 1	% selecting option 2	% selecting option 3	% selecting option 4	% selecting option 5
Online DSH activities	<i>M</i>	<i>SD</i>	%	%	%	%	%
Viewing DSH content	2.58	1.12	20.9	25.1	35.7	11.1	7.1
Talking online with people also known offline	2.12	1.06	41.1	27.8	24.1	4.5	2.5
Talking online with people only known online	1.65	0.90	66.2	17.3	13.4	2.0	1.1
Sharing DSH content	1.47	0.83	72.0	14.2	12.2	0.3	1.4
Creating DSH content	1.20	0.59	89.0	6.2	3.7	0.3	0.8

Note. DSH: Deliberate self-harm.

% selecting option 1, 2, 3, 4, or 5 refers to the percentage of participants selecting one of the given response options.

The presented numbers pertain to the frequency of engagement in each online DSH activity, where 1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Almost every day*, 5 = *Everyday*.

Adolescents and young adults who had engaged in at least one of the online DSH activities (85.3%) used various platforms (see Table 2). For all the online DSH activities, Instagram was the most used platform, except for communication with people also known offline, for which the preponderant platform was WhatsApp.

Table 2. Platforms Used to Engage in Online DSH Activities

Online DSH activities	<i>n</i> (%)										
	Instagram	Tiktok	Facebook	Tumblr	Blogs	Forums	Reddit	Whats-App	Telegram	Discord	Outras
Viewed content	225 (81.2)	187 (67.5)	51 (18.4)	7 (2.5)	15 (5.4)	19 (6.9)	33 (11.9)	100 (36.1)	22 (7.9)	55 (19.9)	46 (16.6)
Talked with peers also known offline about DSH	115 (55.3)	23 (11.1)	13 (6.3)	1 (0.5)	2 (1)	2 (1)	3 (1.4)	162 (77.9)	7 (3.4)	48 (23.1)	5 (2.4)
Talked with peers only known online about DSH	69 (58)	18 (15.1)	7 (5.9)	2 (1.7)	3 (2.5)	4 (3.4)	6 (5.0)	68 (57.1)	6 (5.0)	41 (34.5)	3 (2.5)
Shared content	83 (83.8)	14 (14.1)	9 (9.1)	2 (2.0)	1 (1.0)	1 (1.0)	2 (2.0)	41 (41.4)	2 (2.0)	8 (8.1)	7 (7.1)
Created content	24 (61.5)	14 (35.9)	3 (7.7)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.6)	14 (35.9)	2 (5.1)	6 (15.4)	1 (2.6)

Note. DSH: Deliberate self-harm.

## Testing the Mediation Models

Firstly, the correlation analysis (see Table 3) showed that family conflicts were moderately positively correlated with DSH diversity and SI. Likewise, the findings proved a significant strong positive correlation between DSH diversity and SI. The results also revealed a significant weak positive correlation between family conflicts and the frequency of online DSH activities; a moderate positive correlation between the frequency of online DSH activities and identification with DSH-related content creators; and a weak positive relationship between identification and DSH diversity. See Table 4 for other significant and non-significant correlations.

Table 3. Descriptive Statistics and Pearson Correlations Between Variables

Variables	<i>M (SD)</i>	1	2	3	4	5	Skewness	Kurtosis
(1) Family conflicts	2.53 (0.89)	-					0.33	-0.58
(2) Freq. online DSH	1.74 (0.64)	.19**	-				1.53	3.82
(3) Identification	2.42 (1.07)	.13*	.44**	-			0.21	-0.74
(4) DSH diversity	2.10 (3.04)	.33**	.10	.14**	-		1.71	2.34
(5) Suicidal ideation	34.5 (43.45)	.38**	.14*	.15**	.72**	-	1.37	0.76

Note. Freq.online DSH: Frequency of online DSH activities; Identification: Identification with DSH-related content creators; DSH diversity: Deliberate self-harm diversity  
\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

Overall, the results of the regression analysis (Table 4) revealed that family conflicts were significantly positively associated with DSH diversity, which was significantly positively associated with SI. Also, the direct effect of family conflicts on SI was significant.

Furthermore, the findings showed that: (1) family conflicts were significantly positively associated with the frequency of online DSH activities; (2) the frequency of online DSH activities was significantly positively associated with the identification with DSH-related content creators; (3) the identification with DSH-related content creators was significantly positively associated with DSH diversity, bringing forth a sequential mediation pathway. No other associations between the variables were significant.

Table 4. Regression Analysis of Variable Relationship in Sequential Mediation Model

Result variable	Predictor variable	B	<i>t</i>	<i>p</i>
Freq. of online DSH	Family conflicts	.14	3.60	<.001***
Identification	Family conflicts	.06	1.01	.315
	Freq. of online DSH	.71	8.61	<.001***
DSH diversity	Family conflicts	1.09	6.12	<.001***
	Freq. of online DSH	-.05	-.17	.864
	Identification	.32	1.98	.048*
Suicidal ideation	Family conflicts	6.21	3.25	<.001***
	Freq. of online DSH	2.58	.94	.350
	Identification	.68	.41	.681
	DSH diversity	9.71	17.49	<.001***

Note. DSH: Deliberate self-harm; Freq. of online DSH: Frequency of online DSH activities; Identification: Identification with DSH-related content creators; DSH diversity: Deliberate self-harm diversity. B refers to the unstandardized regression coefficients. Due to missing data, the total sample size for the sequential mediation analysis was  $N = 342$ .

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

The bootstrap test results, detailed in Table 5, revealed that both the pathways we propose in Figure 1 are significant. Specifically, the third indirect effect (i.e., the specific indirect effect of family conflicts on SI through DSH diversity) was significant, fulfilling our second objective. Furthermore, a significant indirect effect (Ind 7) of family conflicts on SI through the frequency of online DSH activities, as well as the identification with DSH-related content creators, and DSH diversity was also indicated, further satisfying the third objective. Thus, the frequency of online DSH activities, identification with DSH-related content creators, and DSH diversity partially and sequentially mediate the relationship between family conflicts and SI. No other indirect paths of influence were statistically significant.

Table 5. The Direct and Indirect Effect of Family Conflicts on Suicidal ideation

	Effects	Boot SE	Boot LLCI	Boot ULCI
<b>Direct effect</b>	<b>6.205</b>	<b>1.910</b>	<b>2.448</b>	<b>9.962</b>
<b>Total indirect effect</b>	<b>11.442</b>	<b>2.120</b>	<b>7.494</b>	<b>15.884</b>
Indirect effect 1	0.358	0.473	-0.430	1.460
Indirect effect 2	0.041	0.140	-0.236	0.362
<b>Indirect effect 3</b>	<b>10.545</b>	<b>2.092</b>	<b>6.633</b>	<b>14.902</b>
Indirect effect 4	0.067	0.169	-0.261	0.440
Indirect effect 5	-0.062	0.438	-0.975	0.818
Indirect effect 6	0.187	0.221	-0.217	0.665
<b>Indirect effect 7</b>	<b>0.306</b>	<b>0.194</b>	<b>0.006</b>	<b>0.754</b>

Note. All reported coefficients are unstandardized. Boot SE, Boot LLCI, and Boot ULCI denote the standard error, lower limit, and upper limit of the 95% confidence intervals for the indirect effects calculated using the bootstrap technique.

Indirect effect 1: F. conflicts → Freq. of online DSH → SI; indirect effect 2: F. conflicts → Identification → SI; indirect effect 3: F. conflicts → DSH diversity → SI; indirect effect 4: F. conflicts → Freq. of online DSH → Identification → SI; indirect effect 5: F. conflicts → Freq. of online DSH → DSH diversity → SI; indirect effect 6: F. conflicts → identification → DSH diversity → SI; indirect effect 7: F. conflicts → Freq. of online DSH → identification → DSH diversity → SI

## Discussion

### Description of DSH Online Activities

A considerable proportion of the community sample reported having practiced at least one of the online DSH activities. The participants engaged frequently in viewing online DSH content, followed by communicating online with people also known offline and with people only known online. Similarly, Nesi et al. (2021) found that talking online with offline peers was the predominant activity, followed by viewing content, talking online with online peers, and, finally, sharing online DSH content. The online nature of these interactions might be appealing because adolescents probably feel free to share their suffering without the weight of inhibitions inherent in face-to-face encounters (Adams et al., 2005).

Young people mostly used Instagram and WhatsApp for DSH-related online activities. Despite some important work on Instagram (e.g., Arendt et al., 2019; Brown et al., 2018, 2020; Giordano et al., 2021) a large body of research focused on forums or websites specifically developed to address these behaviors (e.g., Lewis & Seko, 2016; Whitlock et al., 2006). Only a small number of participants in this study endorsed using those sites. Thus, research that explores online DSH representations in more modern and popular social media (e.g., Instagram, WhatsApp, TikTok) is needed, as already suggested by Nesi et al. (2021).



## The Role of DSH Diversity in the Relationship Between Family Conflicts and SI

The links we found between family conflicts, DSH diversity, and SI, are in accordance with past findings demonstrating that family conflict is a predictive and explanatory variable of DSH and STBs (Aggarwal et al., 2017; Dieserud et al., 2010; Gulbas et al., 2015; Naz et al., 2021; Nicolopoulos et al., 2018; O'Brien et al., 2021; Pelkonen & Marttunen, 2003; Simes et al., 2022; Syed & Khan, 2008). Also, consistent with previous research, DSH diversity is positively associated with an increased SI (e.g., Duarte et al., 2020; Gouveia-Pereira et al., 2022). Overall, the findings examine and can be contextualized through the Gateway Theory, suggesting that DSH precedes a broader spectrum of STBs (Grandclerc et al., 2016; Hamza et al., 2012). By including family conflicts, our results also contribute to the literature and advance the knowledge regarding the Gateway Theory, illuminating the contextual factors that precede the association between DSH and SI. Indeed, the mediation analysis confirmed a significant path of influence between these variables (i.e., family conflicts → DSH diversity → SI).

## The Role of Online DSH Activities, Identification with DSH-Related Content Creators, and DSH Diversity in the Relationship Between Family Conflicts and SI

Concerning our third objective, the frequency of online DSH activities, the level of identification with DSH-related content creators, and DSH diversity partially mediated the effects of family conflicts on SI, as a result. Thus, our results present us with an innovative path of influence, namely the indirect effect related to the frequency of online DSH activities, identification, and DSH diversity on the relationship between family conflicts and SI (i.e., family conflicts → frequency of online DSH activities → identification with DSH-related content creators → DSH diversity → SI). To further discuss these findings, we will provide a framework in relation to previous research.

Literature has shown that poor family functioning and family conflicts are positively related to adolescents' internet use and internet addiction since a negative family environment becomes a source of stress (Lin, 2020); and might not fulfill adolescents' social support needs (Mesch, 2006); or because it hinders young people capabilities to regulate negative emotions, contributing to the development of risky behaviors, including a problematic internet use (Sela et al., 2020). Focusing specifically on online DSH activities, young people who view DSH content, intentionally or accidentally, are more likely to engage in DSH or suicide due to the exposure itself or because they are more vulnerable and at an increased risk, to begin with, and thus being more likely to stumble upon problematic content (Arendt et al., 2019). Previous studies also suggest that some adolescents, lacking family support and feeling incapable of speaking with their family about their DSH, turn to the internet to find social support, a sense of belonging, peers with similar sufferings, and an opportunity to disclose their DSH (Brown et al., 2020; Gámez-Guadix et al., 2022). Thus, it is comprehensible that, in our model, higher levels of family conflicts predict a higher frequency of online DSH activities.

Prior research has stated that online DSH activities can be triggering, lead to a greater risk of a history of DSH and SI, increases in DSH frequency, severity, and SI levels, and may foster imitative behaviors, which in turn may include the discovery and practice of new DSH methods and techniques (e.g., Arendt et al., 2019; Brown et al., 2020; Frost & Casey, 2016; Lee et al., 2022; Lewis & Baker, 2011; Lewis & Seko, 2016; Memon et al., 2018; Nesi et al., 2021; Sternudd, 2012; Zhu et al., 2016). However, our findings showed that using DSH-related internet content and interacting online with peers regarding these behaviors is not enough to increase DSH diversity and SI, as we did not find significant effects between online DSH activities and the clinical variables in our model. Indeed, the results indicated that this effect only happens when young people possessing a background of family conflicts identify with the group of DSH-related content creators and view them as important (i.e., family conflicts → frequency of online DSH activities → identification with DSH-related content creators → DSH diversity → SI) (indirect effect 7).

These findings can be contextualized through Social Identity Theory (Tajfel & Turner, 1979), as it argues that the group only influences the individuals when they identify with the group (Jetten et al., 2017), i.e. when group members are recognized as significant and important. Thus, this study's results seem to be consistent with qualitative findings (Adler & Adler, 2008; Jacob et al., 2017; Sternudd, 2012) pointing that online DSH activities contribute to the development of a self-harm identity through the identification with an online community with whom adolescents share similar sufferings and symptoms, sometimes leading to more severe behaviors.

Overall, we suggest that the ability to predict SI is higher when the frequency of online activities, identification with DSH-related content creators, and, in sequence, DSH diversity, along with a background of family conflicts, are regarded. These results seem very interesting but also concerning since both DSH diversity and SI have a strong impact on suicide risk (e.g., Gouveia-Pereira et al., 2022).

## Strengths and Limitations

A major strength of this study is its innovative character regarding online DSH content representations and use. It not only describes online DSH engagement, as done in previous international studies (e.g., Nesi et al., 2021), but also brings additional understanding concerning the relationship between family conflicts and SI, highlighting a novel model where online DSH activities, identification with DSH-related content creators and DSH diversity have a role in this association. Indeed, worldwide, we found no studies on this topic. However, the current study is not free from limitations. Firstly, the cross-sectional design and the use of self-reported measures do not allow us to infer causality effects and might lead to social desirability and recall biases. The results should be treated with caution, as the Kolmogorov-Smirnov tests revealed a violation of the normality assumption. However, the absolute values of skewness and kurtosis ensured that this violation was not severe (e.g., Kline, 2005). Using a convenience sample also brings further limitations due to the homogeneity and size of the sample. Another limitation pertains to the sample's representativeness and generalizability. For instance, 42% of the participants reported at least one academic retention. Even though in Portugal schools retentions are higher than the mean for other OECD countries (European Commission, 2020), in the current study the number of participants who reported being retained academically seems to be higher compared to samples of other Portuguese studies (e.g., Gouveia-Pereira et al., 2022; Santos et al., 2023). Moreover, the prevalence of adolescents and young adults reporting a previous history of DSH, and the presented mean scores of the SIQ measure, are similar to those found in national studies analyzing both a community and a clinical sample (Duarte et al., 2020; Gouveia-Pereira et al., 2022). Future work should use longitudinal designs to address wider questions of causality and comprise a larger and randomized representative sample of the Portuguese population.

## Conclusion, Implications, and Future Directions

This study highlights both the large proportion of national adolescents using DSH-related online content and interacting online regarding these behaviors with offline and online peers. Besides, it grants further support to past findings, demonstrating that family conflicts are a risk factor for SI, with DSH diversity having a role in this relationship. Furthermore, the most significant contribution of the current study is its novel path of influence that encompasses the frequency of online DSH activities and identification with DSH-related content creators in the previously mentioned model. This knowledge is relevant to developing prevention strategies and interventions that encompass the creation of online content or further supervision of online platforms and interactions, bringing implications for parents, clinicians and policymakers, who need to be aware of this phenomenon and its possible harms. It also contributes to affirming the importance of attending to family factors regarding its role in suicidality and DSH-related internet use, thus making it relevant to incorporate the family system in prevention programs and adolescent therapy, as suggested by Cruz et al. (2014) and Gouveia-Pereira et al. (2014).

Regarding future directions, it would be relevant to replicate these findings in a clinical sample, enabling a better identification of vulnerable adolescents and further contributing to the development of preventive and clinical interventions. Future studies should also focus on deepening the knowledge regarding the relationship between online DSH activities and identity construction, which could improve not only the knowledge in this field but also the clinical practice.

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### Author contribution

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### Declaration of interest statement

The authors have no conflicts of interest to disclose.

### Ethical statement

This manuscript is the authors' original work.

All participants engaged in the research voluntarily and anonymously.

Their data are stored in coded materials and databases without personal data.

The studies involving human participants were reviewed and approved by ISPA-Instituto Universitário Ethics Committee in Lisbon, Portugal (Registry number: I-081-5-22).

### Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

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