



Differences between female suicidal patients with family history of suicide attempt and family history of completed suicide

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Abstract

Background: Family history of suicidal behavior and suicide are both risk factors for suicide. However, the effects of family history of suicide versus suicide attempts on patient suicidal behavior remain unclear. The aim of the present study was to understand if family history of suicide as compared to family history of suicide attempts or no family history of suicidal behavior evidences different associations with suicidal behavior among psychiatric patients.

Method: Participants included 157 female patients between the ages of 18 and 65 years admitted at the Dr. Braulio A. Moyano Neuropsychiatric Women's Hospital.

Results: Seventy-nine patients (50.3%) reported no family history of suicidal behavior (NFHSB), while 78 patients (49.7%) reported a family history of suicidal behavior. Specifically, 41 patients (26.1%) reported a family history of suicide attempt (FHSA) and 37 patients (23.6%) reported a family history of suicide (FHS). These groups showed significant differences between family history of psychopathology and number of previous suicide attempts. Patients with an FHSA were more likely to present with a greater number of previous suicide attempts as compared to patients with NFHSB and FHS.

Conclusion: There is an association between the number of suicide attempts and family history of suicide attempts in female patients hospitalized for suicidal behavior.

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1. Introduction

Several studies have shown that family history of suicidal behavior (FHSB) increases the risk for suicide [2,4–7] and patient suicide attempts [8–11], regardless of psychopathology [7,8,12,13]. The specific risk associated with FHSB may involve social learning following exposure to the event. In

fact, suicide attempters report more memories related to suicidal behavior and expressed more normal attitudes toward suicidal behavior as compared to non-attempters [14].

Family history of completed suicide (FHS) is a significant risk factor for suicidal behavior [6,15]. It has been estimated that patients with FHS are three times more likely to have attempted suicide than those without family history of suicide regardless of psychiatric illness [16]. Exposure to a family member's suicide attempt appears to be associated with increased risk of suicidal behavior as well [17–19]. Nonetheless, the different influence of FHS versus family history of suicide attempts (FHSA) remains unclear.

The present study compared characteristics of suicidal female patients exposed to different types FHSB and no family history of suicidal behavior (NFHSB). It was hypothesized that different types of FHSB would evidence a different impact on the patient's suicidal behavior in terms

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of suicide attempt lethality, age of first suicide attempt, number of hospitalizations, and number of prior suicide attempts.

2. Material and methods

2.1. Participants

Participants were 157 female patients admitted to the Emergency Department of Braulio A. Moyano Neuropsychiatric Hospital for current suicidal ideation or a recent suicide attempt. The Dr. Braulio A. Moyano is a women's neuropsychiatric hospital which cares for patients between 18 and 65 years old, and serves a large, urban catchment area in Buenos Aires, Argentina. The hospital predominantly treats lower-income, uninsured patients.

The average age of the sample was 37.69 years old ($SD = \pm 11.95$). Patients were included in the current study if all relevant measures were completed at the baseline assessment. One patient who had been adopted was not included since she was unable to report about FHSA. The majority of the sample identified as Argentine (90.4%). Overall, patients reported an average of 11.03 years ($SD \pm 3.02$) of completed education and 61 patients (38.9%) reported some degree of religious practice. Over one third of the sample was married ($N = 50$, 31.8%) and currently employed ($N = 56$, 35.7%). Participants were recruited between August 2012 and September 2014.

2.2. Measures

A well-established battery of measures that have been validated for use with a Spanish-speaking sample was employed as reported previously [20].

2.2.1. Patient history of suicidal behavior

Each patient underwent a semi-structured interview with a psychiatrist from the research team, which included questions specific to clinical and demographic variables. Patient history of suicide attempts, age of first attempt, and hospitalizations due to suicidal behavior were assessed during this interview. The Columbia-Suicide Severity Rating Scale (C-SSRS) [21] was used to obtain further details related to patient's lifetime and most recent suicidal behavior.

2.2.2. Patient history of childhood sexual abuse

The presence of childhood sexual abuse was assessed through different screening questions (e.g., *Have you been a victim of sexual abuse?; At what age did you experience sexual abuse?*) administered as part of the semi-structured interview.

2.2.3. Family history of suicidal behavior

Family history of suicidal behavior was self-reported by each participant during the semi-structured interview. Semi-structured interviews used to elicit information about family history of psychopathology and suicidal behavior is a common method used across multiple studies [11,22–26]. Family history of suicide attempts (FHSA) was defined as suicide attempts among first and/or second-degree relatives

of the patients. Family history of suicide (FHS) was defined as a suicide among first and/or second-degree relatives of the patients. Patients reporting FHSA and FHS for different relatives were included in the group specific to suicidal behavior of their first-degree relative. If a patient described a relative as having a history of both suicide attempts and suicide the patient was included in the FHS group. Patients reporting no family history of suicidal behavior were included in the analyses as no family history of suicidal behavior (NFHSB).

2.2.4. Psychopathology

The Mini International Neuropsychiatric Interview (MINI) [27] and the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) [28] were used for diagnostic purposes. Self-report questionnaires included Beck's Hopelessness Scale (BHS) [29], Barratt Impulsiveness Scales (BIS-11) [30], Buss-Durkee Hostility Inventory (BDHI) [31], Hamilton Depression Rating Scale (HDRS) [32], and the Social Adaptation Self-evaluation Scale (SASS) [33].

2.3. Procedure

The Neuropsychiatric Hospital's Ethics Committee approved all study procedures. All patients included in the study received a full description of the study procedures and provided written informed consent. Eligibility criteria included meeting the age requirement of 18 to 65 years old, having the ability to read and write in Spanish, and being admitted to the emergency department due to a recent suicide attempt or current suicidal ideation. During a clinical interview, the psychiatrist interviewer determined whether the patient had suicidal ideation or had made a recent suicide attempt. Suicidal ideation was defined as any current self-reported thought of engaging in suicide-related behavior, and suicide attempt as a potentially self-injurious behavior with a nonfatal outcome, for which there is evidence (either explicit or implicit) that the person intended at some (non-zero) level to kill herself [34]. Patients were excluded from the study if they were unable to respond autonomously due to sedative effects of medication or language limitations, if they were transferred to another institution, or if they had a profession related to mental health (in an effort to limit potential response biases). Patients completed all interviews with a group of psychiatric researchers and all self-report questionnaires were completed within the emergency department.

2.4. Data Analytic Approach

Chi-square analyses were used to compare categorical clinical variables among patients with different family histories of suicidal behavior (i.e., NFHSB, FHSA, FHS). Independent samples *t*-tests were used to compare groups in terms of continuous clinical and demographic variables, while Wilcoxon rank-sum tests (Mann–Whitney U-statistic) were used for non-normally distributed continuous data. A

univariate analysis of covariance (ANCOVA) was conducted to examine associations between family histories of suicidal behavior and patient history of suicide attempts. Relevant variables, patient age, and family history of psychopathology were included as covariates to increase confidence that observed associations were not better accounted for by these theoretically-relevant factors. Pairwise comparisons were performed to further examine differences across the three groups. The threshold for statistical significance was set at $p < 0.05$. Finally, all statistical analyses were conducted using SPSS 20 software.

3. Results

Among the 157 female patients included in the study, diagnostic criteria for affective disorders (66.2%) were the

Table 1
Clinical and demographic characteristics of the patients included in the study (n = 157).

Demographic characteristics	
	Mean (SD)
Age	37.69 (11.95)
Education (years)	11.03 (3.02)
	N (%)
Employed	56 (35.70)
Religious practice	61 (38.90)
Marital status (married/cohabiting)	50 (31.80)
Social network	138 (87.90)
Children	107 (68.20)
Clinical characteristics	
	N (%)
Axis I	
Affective disorder	104 (66.20)
Schizophrenia and related disorders	29 (18.50)
Other	24 (15.30)
Axis II	
Without diagnosis	91 (58.00)
Borderline personality disorder	65 (41.40)
History of sexual abuse	75 (47.80)
Family history of psychiatric illness	131 (83.40)
Family history of completed suicide	37 (23.60)
Family history of suicide attempts	41 (26.10)
Lethality of most recent suicide attempt (indexed via C-SSRS) ⁺	
Low lethality	87 (74.40)
High lethality	30 (25.60)
	Mean (SD)
Age of first suicide attempt	25.92 (14.54)
Number of previous suicide attempts	3.68 (6.45)
Number of hospitalizations for suicide attempts	2.54 (4.67)
Impulsiveness (BIS)	59.85 (15.16)
Hostility (BDHI)	44.22 (9.47)
Hopelessness (BHS)	9.09 (4.62)
Social adaptation	27.08 (8.19)

SD = standard deviation; BIS = Barratt Impulsiveness Scale; BDHI = Buss–Durkee Hostility Inventory; BHS = Beck Hopelessness Scale; C-SSRS = Columbia Suicide Severity Rating Scale. ⁺ Lethality of most recent suicide attempt was assessed only for patients that were admitted to the hospital for a suicide attempt as compared to patients admitted for ideation (n = 117).

most commonly met, followed by schizophrenia and related psychotic disorders (18.5%). Regarding personality disorders, 41.40% of the sample was diagnosed with borderline personality disorder (BPD). One hundred and thirty-one patients (83.4%) reported a family history of psychopathology. Seventy-nine patients (50.3%) reported NFHSB, while 78 patients (49.7%) reported an FHSB. Among participants with an FHSB, 37 patients (23.6%) reported an FHS and 41 patients (26.1%) reported an FHSA (Table 1). Table 2 includes group comparisons in terms of clinically-relevant variables. Groups significantly differed as a function of family history of psychopathology and frequency of previous suicide attempts. The remaining variables related to suicidal behavior (i.e., age at first suicide attempt, number of prior hospitalizations due to suicidal behavior, and lethality of the index episode) did not differ across groups. Groups also did not differ in terms of diagnoses.

Table 3 shows the results from ANCOVAs examining prior suicide attempts. After controlling for patient age and family history of psychopathology, there was a significant association between FHSB and frequency of past suicide attempts [$F(2,152) = 5.06, p = .007, \eta^2 = .062$]. Follow-up pairwise comparisons revealed a significant effect of FHSB, suggesting that patients with an FHS reported a greater number of previous suicide attempts ($M = 6.44, SD = \pm$

Table 2
Comparison of clinical and demographic variables between patients with different family histories of suicidal behavior.

	NFHSB	FHSA	FHS
	(n = 79)	(n = 41)	(n = 37)
	N (%)	N (%)	N (%)
History of sexual abuse ¹	38 (48.10)	21 (51.20)	16 (43.20)
Axis I disorders ¹			
Affective disorder	50 (63.30)	29 (70.70)	25 (67.60)
Schizophrenia and related disorders	16 (20.30)	4 (9.80)	9 (24.30)
Other	13 (16.40)	8 (19.50)	3 (8.10)
Axis II disorders ¹			
Borderline personality disorder	27 (34.20)	23 (56.10)	15 (40.50)
*Family history of psychopathology	58 (73.40)	44 (95.7)	32 (86.50)
High lethality SA ¹	16 (27.10)	7 (17.10)	7 (26.90)
	Mean (SD)	Mean (SD)	Mean (SD)
Age ²	36.94(11.79)	36.76 (12.32)	40.32 (11.83)
Age of first SA ²	26.37 (14.14)	22.05 (12.94)	29.27 (16.40)
*Previous SA ²	2.91 (4.57)	6.44 (10.28)	2.02 (2.11)
Hospitalizations for SA ²	2.53 (5.16)	3.15 (5.13)	1.86 (2.68)
Impulsiveness (BIS) ²	60.96 (14.84)	63.86 (15.24)	53.86 (14.28)
Hopelessness (BHS) ²	8.77 (4.48)	9.89 (4.70)	8.89 (4.82)
Hostility (BDHI) ²	43.70 (9.08)	44.86 (10.57)	44.58 (9.30)
Social adaptation	27.91 (8.19)	28.06 (8.77)	24.50 (7.19)

NFHSB = no family history of suicidal behavior; FHSA = family history of suicide attempt; FHS = family history of suicide; SA = suicide attempt; SD = standard deviation.

* $p < .01$.

¹ Chi-squared statistic.

² ANOVA.

Table 3

Results from analysis of covariance examining the number of suicide attempts among patients with different family histories of suicidal behavior.

		<i>df</i>	<i>F</i>	<i>p</i>	<i>n</i> ²
Covariates					
FHP		1	.00	.98	.00
Age		1	.038	.85	.00
Primary predictor					
FHSB		2	5.06	.007	.06
	<i>M</i>	<i>SD</i>			
NFHSB	2.91	4.57			
FHSA	6.44	10.29			
FHS	2.27	2.38			

FHSB = family history of suicidal behavior; FHP = family history of psychopathology; NFHSB = no family history of suicidal behavior; FHSA = family history of suicide attempt; FHS = family history of suicide.

10.29) compared to patients with NFHSB ($M = 2.91$, $SD = \pm 4.57$; $p = .019$) and patients with an FHS ($M = 2.27$, $SD = \pm 2.38$; $p = .015$) (Table 4). There was no significant difference in history of suicide attempts between patients with an FHS and those with NFHSB. Notably, findings remained significant when family history of psychopathology was not included as a covariate [$F(2,153) = 5.38$, $p = .005$, $n^2 = .066$]. Also, given the high percentage of patients diagnosed with BPD, a separate analysis was run among only patients meeting criteria for BPD. There was not a significant relation between FHSB and frequency of past suicide attempts among female patients diagnosed with BPD [$F(2, 60) = 1.99$, $p = .144$, $n^2 = .062$].

4. Discussion

FHSB may include family history of suicidal thoughts, plans, and attempts, as well as completed suicide. Most previous work has examined the impact of FHSB broadly defined. To our knowledge, this is the first study to examine the possible differential risk for suicidal behavior across different types of family histories of suicidal behavior. When comparing the family history rates among our patient sample with previous work (between 24 to 35%) [1,22,26,35–37] the present sample reported a higher prevalence. One possible explanation for this difference is that our study was not limited to first-degree relatives, but also included

Table 4

Results from pairwise comparisons examining the main effects of family history of suicidal behavior in terms of patient suicide attempts.

	Mean difference	<i>S.E.</i>	Bonferroni adjusted 95% CI
1. NFHSB vs. FHS	.609	1.28	–2.49 to 3.71
2. NFHSB vs. FHSA	–3.534*	1.27	–6.617 to –.452
3. FHS vs. FHSA	–4.143*	1.45	–7.66 to –.617

NFHSB = no family history of suicidal behavior; FHSA = family history of suicide attempt; FHS = family history of suicide.

* $p < .01$, where p values are adjusted using the Bonferroni method.

second-degree relatives. Importantly, when compared to a study defining FHSB to include first and second degree relatives of suicide attempters, a similar prevalence (42%) was observed [9]. Our findings indicate that among patients reporting an FHSB, 26.1% reported an FHSA and 23.6% reported an FHS. These findings are in accordance with previous work suggesting a prevalence between 5.5 and 20% among people with a family history of suicide [1,25,37,38] and 18 to 24% among people with a family history of a suicide attempt [1,37,38].

Suicidal patients who reported an FHSA reported an increased number of suicide attempts in comparison with the patients who reported NFHSB or an FHS. The other suicide-related variables did not differ across groups. In part, these results are consistent with results previously reported by Lizardi et al. (2009), which suggested that individuals with an FHSB exhibited a greater number of suicide attempts; however, this previous study did not assess the differences between FHSA and FHS [39]. Nonetheless, substantial previous work has demonstrated a positive correlation of FHS and increased suicide risk among patients [37,40]. Given that suicide attempts are a robust predictor of future suicidal behavior, the current findings extend the current literature to suggest that an FHSA is significantly associated with a higher frequency of suicide attempts among suicidal patients as compared to an FHS.

There were no differences in frequency of previous suicide attempts between the FHS and NFHSB groups. Nonetheless, it is possible that the FHS group may be at risk for more lethal suicide attempts as compared to patients with NFHSB. Differences in frequency of previous (non-lethal) suicide attempts may not be the best indicator of this risk. Examination of suicide attempt lethality and completed suicides as a function of family history of suicide would be helpful for examining this possibility.

It is important to consider that confounding factors may account for these differences. For example, previous work suggests that familial transmission of suicidal behavior is partly mediated by, and partly independent of, the transmission of psychiatric disorders [8,16,36,41–48]. However, in the present study, the statistical significance of familial transmission of suicidal behavior was independent of age and history of family psychiatric illness, suggesting that FHSB is uniquely related to patient suicide attempt history. Other work suggests that patients with an FHSB made their first suicide attempt at an earlier age than those patients reporting NHSB [22], suggesting that an FHSB may influence the age of onset of suicidal behavior among offspring [12]. However, age of first attempt was not related to family history of suicidal behavior in the current study. Future work may benefit from exploring age of exposure to FHSA and FHS to determine if the impact of family history of suicidal behavior varies as a function of age of exposure to the suicidal behavior.

According to the diathesis stress model of suicidal behavior [49], the impact of environmental stressors should

be considered when explaining suicidal behavior. For example, sexual abuse is a robust stressor strongly associated with suicidal behavior [50] that may increase the likelihood of expressing traits related to suicide risk [4,12,51,52]. However, in the present study, no group differences were observed in personal history of sexual abuse or stressful life events. It also is important to consider trait-like components of the diathesis for suicidal behavior. Impulsivity and aggression are thought of as intermediate behavioral phenotypes proposed to mediate the transmission of suicidal behavior [12] and increase risk for suicide attempts [3]. In the current study, however, impulsivity and hostility did not differ across groups. It is possible that because all participants in the current study were included due to significant current suicidal behavior, links between these other risk factors and FHSA were masked. Accordingly, future work that included a wider range of suicidal behavior would help to further elucidate links between FHSA and other risk factors for suicidal behavior.

The familial transmission of suicidal behavior may be partly explained by modeling of suicidal behavior and imitation [50,53]. In the current study, FHSA was associated with higher frequency of patient suicide attempts, which is consistent with evidence suggesting that exposure to suicidal behavior increases risk for suicidal behavior [54]. Importantly, previous work suggests that youth exposed to a sibling's suicide do not evidence subsequent imitation [55], while exposure to a friend's suicide attempt, but not to a friend's completed suicide, appears to be associated with increased risk of suicidal behavior [17–19]. Knowing a person who has attempted suicide, whether a biological relative or not, is thought to be a risk factor for suicidal behavior [56]. Nevertheless, some authors suggest that imitation alone is not a clinically significant contributor to the familial transmission of suicidal behavior [4,50,53,57]. It is also important to consider the increased social support that arises following a suicide in the family [58]. Social support is indeed a buffer against suicidal behavior and may help explain why FHS does not relate to patients' history of suicide attempts above and beyond FHSA.

Family history of suicide attempts may habituate family members to suicidal behavior, potentially increasing the likelihood of future attempts. It also has been postulated that suicidal behavior is modeled and vicariously learned from family members as potential coping strategies and problem solving skills [59]. Negative problem solving orientation, that is cognitions and emotions that impede effective problem solving, are associated with suicide risk [60], and evidence suggests that inpatient suicide attempters use less effective coping strategies compared to non-suicidal inpatients [61]. In fact, it has been suggested that FHSA among suicide attempters may lead to the development of a negative problem solving orientation [26], and in turn lead to a higher likelihood of multiple patient suicide attempts. However, in the current study we were able to separate patients according to FHSA and FHS, leading to the finding that an FHSA

increased the likelihood of previous suicide attempts compared to FHS and NFHSB. Accordingly, individuals that live in family environments where suicidal behavior is modeled as a solution when problems arise may be more likely to attempt suicide as a problem solving strategy [26].

4.1. Limitations

Limitations should be considered when interpreting these findings. First, the presence or absence of FHSA was determined by a semi-structured interview, which included assessment of other demographic data. Indeed, this method is similar to methods used across multiple studies [11,22–26]. Nonetheless, when possible, large population registries of suicide attempts and suicides are the most compelling for understanding family history of suicide and suicidal behavior [50]. Second, Dr. Braulio A. Moyano Hospital is a women's neuropsychiatric hospital where only female patients are treated; thus, results are not generalizable to male patients. Future work should examine these patterns among men, given men are at highest risk for suicide. Importantly, many suicide attempts may pose low lethality and not result in hospitalization. As a result, these findings are only generalizable to individuals who engage in suicidal behavior that leads to hospitalization. In addition, results may not generalize to populations presenting without recent suicidal behavior or experiencing less severe risk for future suicidal behavior. Indeed, the current sample reported a mean of almost 4 previous suicide attempts. The high rate of previous suicide attempts may partly be explained by the relatively impaired nature of this sample. All patients were hospitalized in a neuropsychiatric hospital due to recent suicide-related behavior. Taking this into account, the results may not be representative of less severe/ambulatory patients. Replication across a wider range of patient samples is now needed. Also, information specific to the nature of the family member's suicide attempt was not collected (e.g., patient age when the family member engaged in the suicidal behavior, lethality of the suicide attempt, frequency of suicide attempts, did the patient witness the event). Examining these factors will help in developing a more complete picture of how FHSA relates to patient suicidal behavior. Finally, the cross-sectional nature of the study is helpful in understanding risk for suicide, but longitudinal work will be necessary for establishing FHSA as a risk factor for attempting suicide.

Current limitations notwithstanding, the results of this study have important clinical implications. For example, it is important to recognize that suicidal patients with an FHSA exhibited an increased number of suicide attempts in comparison with suicidal patients with NFHSB or FHS. The seriousness attributed to suicide, and the support provided for family members who suffered a loss from suicide should also be provided to people with family members who attempted suicide. It is important to acknowledge the seriousness for both behaviors and may be particularly important to consider as a target of early assessment strategies.

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