

Early interpersonal violence mediates the effect of family history of mental disorder on suicide attempts in a non-clinical sample

La violenza interpersonale precoce media l'effetto della storia familiare di disturbo mentale sui tentativi di suicidio in un campione non clinico

RODOLFO ROSSI^{1,2*}, DALILA TALEVI¹, ELEONORA GREGORI¹, ELEONORA QUARTA¹,
ALESSIA LUCASELLI¹, FRANCESCA PACITTI¹

*E-mail:rudy86.rossi@gmail.com

¹Department of Biotechnological and Applied Clinical Sciences, Section of Psychiatry, University of L'Aquila, Italy

²Department of Systems Medicine, Chair of Psychiatry, Tor Vergata University of Rome, Italy

SUMMARY. Background. Suicide is a leading cause of death worldwide, with several risk factors, including a family history of mental disorders (FHMD) and interpersonal violence. The relationship between these risk factors needs further investigation. **Aim.** Addressing the impact of interpersonal violence on suicide attempts, and its interaction with FHMD. **Methods.** 192 participants completed an online questionnaire, including the Psychological Maltreatment Review and the Karolinska Interpersonal Violence Scale (putative mediating variables), questions about previous suicide attempts and FHMD. Logistic regression and mediation analysis were performed. **Results.** FHMD (OR=7.09, 95%CI [2.20,22.81]), expressed violence in childhood (OR=2.55, 95%CI [1.26,5.18]) and exposure to violence in childhood (OR=2.80, 95%CI [1.80,4.34]) predicted attempted suicide. Exposure to, and expression of violence in childhood mediated 15.23% and 9.63% respectively of the total effect of FHPD on attempted suicide. **Limitations.** Small sample size, reporting bias on FHMD an attempted suicide, self-selection bias due to sampling technique. **Conclusions.** The familial load on adult suicidal behavior is partially mediated by exposure to violence in childhood, suggesting that the presence of a relative affected by any psychiatric condition may contribute to exposure to violence in childhood, which eventually enhances the risk of suicide in adulthood.

KEY WORDS: suicide, interpersonal violence, adverse childhood experiences.

RIASSUNTO. Introduzione. Il suicidio è una delle principali cause di mortalità a livello globale, ed è associata a diversi fattori di rischio, tra cui la familiarità per patologia psichiatrica (FHMD) e l'esposizione alla violenza interpersonale. La relazione tra questi due fattori di rischio merita ulteriori approfondimenti. **Scopo.** Indagare l'impatto della violenza interpersonale sulla suicidalità e la sua eventuale interazione con la familiarità per patologia mentale. **Metodi.** Centonovantadue partecipanti hanno completato un questionario online che comprendeva la Psychological Maltreatment Review e la Karolinska Interpersonal Violence Scale, oltre a domande su precedenti tentativi di suicidio e sulla presenza di familiarità per patologia psichiatrica. Sono state condotte analisi di regressione e di mediazione. **Risultati.** La familiarità per patologia psichiatrica (OR=7,09, 95%CI [2,20;22,81]), la manifestazione di violenza interpersonale durante l'infanzia (OR=2,55, 95%CI [1,26;5,18]) e l'esposizione alla violenza interpersonale durante l'infanzia (OR=2,80, 95%CI [1,80;4,34]) sono associati ai tentativi di suicidio. L'esposizione a, e la manifestazione di violenza interpersonale mediano il 15,23% e il 9,63% rispettivamente dell'effetto totale che la familiarità per patologie psichiatriche ha sui tentativi di suicidio. **Limiti.** Scarsa numerosità campionaria, reporting bias circa la familiarità per patologia psichiatrica e i pregressi tentativi di suicidio, bias di autoselezione legato al campionamento online. **Conclusioni.** Il carico che la familiarità per patologia psichiatrica ha sui comportamenti suicidari è parzialmente mediato dall'esposizione a comportamenti violenti durante l'infanzia, il che suggerisce che la presenza di un parente affetto da una qualsiasi condizione psichiatrica possa contribuire al coinvolgimento in episodi di violenza durante l'infanzia, che a sua volta aumenta il rischio suicidario in età adulta.

PAROLE CHIAVE: suicidio, violenza interpersonale, esperienze infantili avverse.

BACKGROUND

Suicide is a leading cause of death worldwide, with more than one million people dying by suicide every year^{1,2}. Several personal and interpersonal risk factors for suicide have been investigated in scientific research³, however their mutual relationships need further investigation².

Among personal risk factors, a family history of a mental disorder (FHMD) is a strong predictor of suicidal behavior⁴, acting through different potential pathways, including the transmission of biological risk factors, as suggested by genetic studies⁵, as well as interfering with psychological protective factors such as resilience^{6,7}. However, FHMD may also interfere with the relational environment in which an indi-

vidual develops as a child by several mechanisms⁸, including exposure to violence⁹. These two mechanisms are separated though interacting each other¹⁰.

In recent years, research has focused on adverse childhood interpersonal risk factors for suicide, including interpersonal violence¹¹⁻¹³, maltreatment and neglect¹⁴, being suicide the final common outcome of different psychopathological pathways. Exposure to violence during childhood seems to have the most relevant impact on suicide, with an OR of 2.5¹⁵; neglect and maltreatment have important pathoplastic effects on dissociative-spectrum disorders¹⁶, which are strictly linked with self-harm¹⁷ and suicidal risk.

With the present paper, we explore the impact on suicide attempts of different interpersonal risk factors, including interpersonal violence and maltreatment, and their interaction with FHMD in a community sample.

METHODS

For the purpose of this study, we designed an online survey in Italian (using the software Google Forms®) followed by a snowball sampling technique (e-mail and social networks), by asking participants to re-share the survey link on their social networks.

The following instruments were included:

- The Psychological Maltreatment Review¹⁸ (PMR) is a self-report 30 items questionnaire that retrospectively investigates psychological abuse, neglect and psychological support during childhood and adolescence from the two parents separately, on a 7-point Likert scale. We calculated the total score for each dimension summing the scores for the two parents. The validation study for the Italian version is ongoing: PMR was translated from English to Italian with a back translation processes; the version used in this study was authorized by the original authors.
- The Karolinska Interpersonal Violence Scale (KIVS)^{11,19} investigates exposition to violence or the enactment of violent behavior in childhood (from 6 to 14 years of age) and adulthood (from 15 years of age on). It is filled-in through a semi-structured interview, although a self-report version has been previously utilized by the authors²⁰. Within each subscale a score from 0 to 5 is assigned. The validation study for the Italian version is ongoing: KIVS was translated from English to Italian with a back translation processes; the version used in this study was authorized by the original authors.
- Previous suicide attempts (SA): were investigated using a single question phrased as follows: "have you ever deliberately acted in order to end your life?".
- FHMD was assessed with a single question phrased as follows: "is anyone of your first degree relatives (parents, siblings, grandparents, cousins) affected by any psychiatric disorder?" with dichotomous response *yes/no*.

A consent form to the study was presented at the beginning of the questionnaire, providing consent was required to proceed with the questionnaire. The study protocol was approved by the local ethical committee.

Data analysis

Descriptive statistics were calculated for each variable of interest as appropriate. In a first wave of analysis, a logistic regression was performed in order to test the association of PMR and KIVS scores with SA. Secondly, we performed a mediation analysis

in order to assess the proportion of the effect of FHMD (independent variable) on SA (dependent variable) being mediated only by those interpersonal variables (interpersonal violence, maltreatment, neglect; candidate mediating variables) that showed a substantial effect on SA. All analysis were performed using STATA® 13. Mediation analysis was performed using the binary mediation command. Standard errors and bias-corrected confidence interval were estimated using a bootstrapping technique.

RESULTS

Hundred and ninety questionnaires were collected. In our sample, 105 (54.7%) participants were female. Mean age was 37.38 years, 95% CI [35.87-38.88]. Seventeen (8.85%) participants reported previous SA. Summary statistics for PMR and KIVS and FHMD scores are reported in Table 1. Logistic regression analysis showed that the most relevant risk factors for attempted suicide were FHMD (OR=7.09, 95% CI [2.20,22.81]), expressed violence in childhood (OR=2.55, 95% CI [1.26,5.18]) and exposure to violence in childhood (OR=2.80, 95% CI [1.80,4.34]) (Table 1). The latter two variables were selected for the mediation analysis. Although the three PMR subscales were statistically significant, their OR were too small to be considered substantially significant, and were not included in the mediation analysis. Total effect of FHMD mediated by exposure to violence in childhood and expression of violence in childhood were 15.23% and 9.63% respectively (Table 2). Taking into account that FHMD maintained significance in both mediated models, this is a case of partial mediation.

DISCUSSION

In the present paper we assessed the role of different types of adverse interpersonal experiences, including interpersonal violence and psychological maltreatment, as mediators of the effect of FMHD on suicide attempts. In order to do so, we recruited a community sample using an online questionnaire.

Our findings show a relatively higher lifetime prevalence of SA compared to previous reports that estimate lifetime prevalence of suicide attempts around 5%²¹. This difference could be due to self-selection bias. On the other hand, online sampling may have counteracted a stigma-induced avoidance bias of the addressed topic, resulting in a more realistic estimate of attempted suicide prevalence. A second finding is that the effects of psychological abuse and neglect during childhood on suicide attempts are smaller than expected, compared to the relevant effect of exposure to and expression of violence during childhood. In recent meta-analyses, emotional abuse and neglect showed an OR for suicidal behavior of 3.08 and 1.85 respectively¹⁴. Such difference may be due to the reduced impact of incident psychopathology in our sample, which could mediate the effect of neglect and childhood maltreatment towards suicide. On the other hand, this result suggests that exposure to psychological maltreatment alone, without a direct exposure to physical violence, could be insufficient to determine an extreme psychological outcome such as SA, as if psychological and physical abuse were on a dose-response continuum.

Early interpersonal violence mediates the effect of family history of mental disorder on suicide attempts in a non-clinical sample

Table 1. Descriptive statistics and logistic regression.

	Total Sample (Mean / %)	TS+ (Mean / %)	TS – (Mean / %)	OR for Suicide Attempt	95% CI
FHMD	35.42%	76.47%	31.43%	7.09**	[2.20,22.81]
PMR Abuse	20.18 (16.72)	33.70 (20.14)	18.86 (15.81)	1.04***	[1.02,1.06]
PMR Neglect	14.80 (20.44)	33.76 (30.00)	12.96 (18.37)	1.03***	[1.02,1.05]
PMR Support	77.13 (27.78)	60.64 (26.87)	78.73 (27.42)	0.98**	[0.96,0.99]
KIVSV expressed violence childhood	0.24 (0.59)	0.76 (0.97)	0.18 (0.51)	2.55**	[1.26,5.18]
KIVSV expressed violence adulthood	0.14 (0.52)	0.35 (0.60)	0.12 (0.51)	1.63	[0.84,3.16]
KIVSV Exposed to violence childhood	0.45 (0.84)	1.47 (1.46)	0.35 (0.68)	2.80***	[1.80,4.34]
KIVSV Exposed to violence adulthood	0.39 (0.70)	0.70 (1.04)	0.36 (0.66)	1.67	[0.94,2.97]

* p<0.05, ** p<0.01, *** p<0.001. FHMD: Family history of psychiatric disorder; PMR: psychological maltreatment review; KIVS: Karolinska Interpersonal Violence Scale.

Table 2. Mediation analysis.

Dependent variable: attempted suicide			
Independent variable: FHMD	Coef.	Bootstrap Std. Err.	[95% bias-corrected CI]
<i>KIVSV Exposed to violence in childhood</i>			
total indirect	0.07	0.03	[0.02, 0.14]
direct effect	0.38	0.12	[0.07, 0.60]
total effect	0.45	0.12	[0.18, 0.66]
proportion of total effect mediated	15.23%		
<i>KIVSV Expressed violence in childhood</i>			
total indirect	0.04	0.02	[0.00, 0.11]
direct effect	0.40	0.12	[0.15, 0.63]
total effect	0.45	0.12	[0.20, 0.67]
proportion of total effect mediated	9.63%		

KIVS: Karolinska Interpersonal Violence Scale; FHMD: family history of mental disorder.

Our main finding is that the familial load on adult SA, is partially mediated by exposure to violence in childhood. In our community sample, the predictive value of FHMD for suicide was large, compared to previous reports in the literature. However, a significant part of the risk effect was carried by exposure to violence. This result suggests that the presence of a first degree relative affected by any psychiatric condition contributes to a more violent environment, that ultimately enhances the risk of suicide in adulthood. This result is coherent with previous evidence of an association between mental disorders and violent behaviors²². This putative pathway towards suicide requires further investigation, given its potentially preventable impact on adult psychopathology²³. Further studies should address the presence of any “diagnosis-specific” effect, as in our sample we could not assess the exact diagnosis in the family nor in the subjects.

Strengths and limitations

The main limitations of our study are:

- small sample size, which may have contributed to the large std. errors and 95% CIs estimates in our analysis;
- poor characterization of psychopathological features in FHMD and in participants. However, we chose not to collect data on these aspects as online collection may have returned incorrect data due to reporting bias;
- biased estimates of attempted suicide prevalence due to self-selection bias;

The main strengths in our study are:

- exploring variables relevant to an “hot-topic” such as suicide in a non-clinical sample;
- potential reduction of stigma-related participation bias.

CONCLUSIONS

This is the first paper to the best of our knowledge to address the mediating role of different aspects of interpersonal violence in the relation between family history of psychiatric disorders and suicide attempts. Our results suggest a potentially critical role of intervention on mental health in the general population as a prevention strategy for the following generation.

Acknowledgment: the authors have no acknowledgment to mention for this paper.

Role of funding source: no funding was received for this study.

Conflict of interests: the authors have no conflict of interests to declare.

REFERENCES

1. Sinyor M, Tse R, Pirkis J. Global trends in suicide epidemiology. *Curr Opin Psychiatry* 2017; 30: 1-6.
2. Biondi M, Iannitelli A, Ferracuti S. [On the Unpredictability of Suicide]. *Riv Psichiatri* 2016; 51: 167-71.
3. Rossi R, Succi V, Collazzoni A, Lucaselli A, Di Lorenzo G, Pacitti F. Psychotic-like experiences interaction with common risk factors for suicidal ideation. *J Psychopathol* 2019; 25: 205-11.
4. Hawton K, Casañas I, Comabella C, Haw C, Saunders K. Risk factors for suicide in individuals with depression: a systematic review. *J Affect Disord* 2013; 147: 17-28.
5. Johansson C, Jansson M, Linnér L, et al. Genetics of affective disorders. *Eur Neuropsychopharmacol* 2001; 11: 385-94.
6. Rossetti MC, Tosone A, Stratta P, et al. Different roles of resilience in depressive patients with history of suicide attempt and no history of suicide attempt. *Rev Bras Psiquiatr* 2017; 39: 216-9.
7. Rossi A, Talevi D, Collazzoni A, Parnanzone S, Stratta P, Rossi R. From basic human values to interpersonal violence: a mental illness sample. *J Aggress Maltreatment Trauma* 2019; 1-13.
8. Quartini A, Pacitti F, Bersani G, Iannitelli A. From adolescent neurogenesis to schizophrenia: opportunities, challenges and promising interventions. *Biomed Rev* 2017; 28: 62-9.
9. Talevi D, Pacitti F, Costa M, et al. Further exploration of personal and social functioning: the role of interpersonal violence, service engagement, and social network. *J Nerv Ment Dis* 2019; 207: 832-7.
10. Wilcox HC, Kuramoto SJ, Brent D, Runeson B. The interaction of parental history of suicidal behavior and exposure to adoptive parents' psychiatric disorders on adoptee suicide attempt hospitalizations. *Am J Psychiatry* 2012; 169: 309-15.
11. Jokinen J, Forslund K, Ahnemark E, Gustavsson JP, Nordström P, Åsberg M. Karolinska interpersonal violence scale predicts suicide in suicide attempters. *J Clin Psychiatry* 2010; 71: 1025-32.
12. Stefansson J, Nordström P, Runeson B, Åsberg M, Jokinen J. Combining the Suicide Intent Scale and the Karolinska Interpersonal Violence Scale in suicide risk assessments. *BMC Psychiatry* 2015; 15: 1-8.
13. Talevi D, Imburgia L, Luperini C, et al. Interpersonal violence: identification of associated features in a clinical sample. *Child Abus Negl* 2018; 86: 349-57.
14. Norman RE, Byambaa M, De R, Butchart A, Scott J, Vos T. The long-term health consequences of child physical abuse, emotional abuse, and neglect: a systematic review and meta-analysis. *PLoS Med* 2012; 9: e1001349.
15. Rajalin M, Hirvikoski T, Jokinen J. Family history of suicide and exposure to interpersonal violence in childhood predict suicide in male suicide attempters. *J Affect Disord* 2013; 148: 92-7.
16. Rossi R, Longo L, Fiore D, et al. Dissociation in stress-related disorders and self-harm: a review of the literature and a systematic review of mediation models. *J Psychopathol* 2019; 25: 162-71.
17. Liotti G. Trauma, dissociation, and disorganized attachment: three strands of a single braid. *Psychotherapy* 2004; 41: 472-86.
18. Briere J, Godbout N, Runtz M. Research on assessment and intervention. The psychological maltreatment review (PMR): initial reliability and association with insecure attachment in adults. *J Aggress Maltreatment Trauma* 2012; 21: 300-20.
19. Talevi D, Pacitti F, Parnanzone S, et al. The Karolinska Interpersonal Violence Scale, Italian version. *J Psychopathol* 2019; 25: 115-9.
20. Khemiri L, Jokinen J, Runeson B, Jayaram-Lindström N. Suicide risk associated with experience of violence and impulsivity in alcohol dependent patients. *Sci Rep* 2016; 6: 19373.
21. Nock MK, Borges G, Bromet EJ, Cha CB, Kessler RC, Lee S. Suicide and suicidal behavior. *Epidemiol Rev* 2008; 30: 133-54.
22. Elbogen EB, Johnson SC. The intricate link between violence and mental disorder. *Arch Gen Psychiatry* 2009; 66: 152.
23. Bersani G, Rinaldi R, Iannitelli A. Il suicidio assistito degli italiani in Svizzera e il silenzio della psichiatria. *Riv Psichiatri* 2018; 53: 173-6.