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LOCATION OF PRESENTING AUTHOR: Europe

TIME ZONE OF PRESENTING AUTHOR: British Summer Time (GMT + 1)

TYPE OF SUBMISSION: Oral paper

MEMBER STATUS: Associate

ELIGIBLE FOR THOMPSON AWARD: Yes
ELIGIBLE FOR ROWEWARD: No

TITLE: *Genetic and environmental aetiologies of suicidal and non-suicidal self-harm*

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KEYWORDS: self-harm; mental health; suicidal self-harm; non-suicidal self-harm

ABSTRACT:

Introduction: Self-harm can be further refined into suicidal self-harm (SSH) and non-suicidal self-harm (NSSH). Using a twin design, we aimed to: (1) investigate to what extent SSH and NSSH share the same or distinct genetic and environmental aetiologies; and (2) investigate the shared genetic and environmental overlap between a range of psychiatric symptoms with both SSH and NSSH.

Methods: We analysed data from the Twins Early Development Study (TEDS). A total of 9,085 twins (62.4% female) answered questions related to lifetime presence of self-harm at age 21. Parent-reported and self-reported mental health measures were collected at age 16. Genetic SEM analyses were performed using raw maximum likelihood estimation in OpenMx [1].

Results: Heritability estimates for NSSH (0.54, 95% CI: 0.35-0.60) and SSH (0.49, 95%

CI: 0.22-0.58) are similar. There were no effects of shared environmental influences. Additive genetic factors explain 56.3% of the phenotypic correlation (r = 0.87) between NSSH and SSH. The genetic and environmental correlations between NSSH or SSH with the mental health measures show no statistically significant difference.

Conclusion: This study shows that there is genetic influence on NSSH and SSH, with over half of their correlation explained by shared genetic factors. No distinct pattern of associations between mental health measures and either NSSH or SSH was observed. Together, the evidence suggests no aetiological difference between NSSH and SSH.

[1]   S. Boker *et al*., "OpenMx: An Open Source Extended Structural Equation Modeling Framework," *Psychometrik*a, vol. 76, no. 2, pp. 306–317, Apr. 2011.