Suicide risk in the young:
what, how and who to study

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Suicide is the second leading cause of death in children and adolescents and occurs at a higher rate in this population than in any other age group. In their latest Annual Research Review published in the Journal of Child Psychology and Psychiatry, Christine B. Cha and colleagues outline the epidemiology and potential etiology of suicide, indicate possible therapeutic and preventative strategies and highlight the areas that remain for future research.

Suicide is a global, leading cause of death, but it is most prevalent in adolescents and young adults. A wealth of studies has identified potential risk factors to help explain how and why suicidal behaviours emerge during adolescence. But despite vast progress, a full understanding of the etiology is lacking, thus hindering the development of effective therapeutic and preventative measures.

Definitions: Cha et al. first note that there is a lack of consistent definitions and classifications throughout the suicide literature. As such, they encourage that sufficient detail be provided when defining study variables in future studies, to avoid misclassification. Cha et al. define suicidal ideation as "the consideration of or desire to end one's own life". Such desire may range from passive (wanting to be dead) to active ideation (wanting to kill oneself), and may occur as frequently as once per week. Suicide attempt differs from ideation as with an attempt, an action intended to deliberately end one's own life is made. Suicide death is defined as "a fatal action to deliberately end one's own life", and the method that is used seems to vary geographically.

Epidemiology: The prevalence of suicidal ideation in adolescents ranges from 19.8 to 24.0%, starting after the age of 10 years and rapidly increasing up to age 17 years. Those who experience suicidal ideation during adolescence are ~12 times more likely to attempt suicide by the age of 30 years. Suicide attempts have a lifetime prevalence of 3.1% to 8.8%: they typically occur after the age of 12 years and increase in prevalence in mid-to-late adolescence. Suicide-associated death accounts for 8.5% of all deaths in adolescents and young adults aged 15 to 29 years, and increases in prevalence from ages 15 to 19 years.

The developmental nature of suicide risk across adolescence is under-reported. Interestingly, the timing of puberty has been shown to have an effect on suicidal behaviours, but how or why this is the case is unknown. Cha et al. suggest, therefore, that more longitudinal studies that include wide age ranges and encompass developmental shifts during adolescence would be valuable.

Gender differences can be observed in suicidal behaviour: adolescent girls are more likely to experience suicidal ideation and attempt suicide than boys, yet boys are up to three times more likely to die by suicide. Gender identity and sexual orientation also impacts on the prevalence of suicide ideation and attempt. Adolescents who relate to a sexual minority status show an

elevated risk of suicidal behaviours than their heterosexual counterparts. Risk of suicide death is also higher in indigenous American Indian, Alaska Native and Aboriginal youths in the USA and Canada compared to other ethnicities. However, these high-risk socio-demographic populations are under-represented in the suicide literature and thus Cha et al. encourage more attention be paid to these high-risk populations in future studies.

Etiology: Many risk factors for suicidal behaviours have been described, but a clear understanding of the pathways through which suicidal behaviours develop has not yet been reached. In terms of environmental risk factors, childhood maltreatment/bullying is one of the strongest factors influencing suicidal thoughts and behaviours in adolescents. Twin studies have shown that sexual abuse in childhood can predict future suicidal ideation and suicide attempt. Long periods of exposure to bullying also increase the likelihood of suicidal ideation and attempt, in both the victim and offender. Cyber bullying and the impact of social media is an important consideration in today's digital revolution, but Cha et al. find that the data thus far are mixed: some have proposed that the Internet provides a forum of help and social support, while others highlight that it can offer sources of suicide-related information.

Psychological factors that correlate with suicidal behaviours have mostly been measured by self-report, behaviour and physiology. The researchers describe that affective processes, such as worthlessness, low self-esteem and negative self-referential thinking, can strongly predict future suicidal ideation and suicide attempt. In terms of cognitive factors that correlate with suicidal behaviours, impulsivity has received moderate support as a risk factor for suicidal behaviour, particularly when in combination with aggression. Others have reported that deficits in sustained attention and vigilance correlate with suicidal thoughts and behaviours. Interpersonal connectedness (loneliness) has been widely assessed in longitudinal studies, but the evidence in support of loneliness as a direct risk factor for suicidal behaviours is only moderate.

Biological correlates: Several biological correlates with suicidal thoughts have been described. For example, researchers identified lower functional connectivity between several neural regions in those who are suicidal compared to controls. Specifically, structural abnormalities have been detected in the hippocampus, dorsolateral prefrontal cortex and highly interconnected brain neural networks involved in regulating the resting brain state.

At the molecular level, serotonin is the most widely studied molecule in terms of suicidal behaviours, with studies dating back to the 1970's showing low serotonin levels in those who have died by suicide compared to controls. Preliminary studies have also implicated abnormal TNFα, IL-β and BDNF levels in suicidal behaviours. Finally, although preliminary studies support that there is a heritable component to suicidal behaviour, the genetic basis is currently unknown. Cha et al. consider that genetic studies are lacking in this field, in particular genome wide association studies.

Although these biological findings are, on the most part, only preliminary, research in this area is rapidly evolving. Cha et al highlight that the biological factors identified thus far have corroborated behavioural and self-reported data but there remains disconnect between biological mechanisms and overt behaviours.

Full article is available to be viewed online at https://bit.ly/2l325Mz

Original paper:

Vella, S., Gardner, L., Swann, C. and Allen, M. (2018). Trajectories and predictors of risk for mental health problems throughout childhood. Child and Adolescent Mental Health. doi: https://doi.org/10.1111/camh.12279

Referring to:

Cha, C.B., Franz, P.J., Guzman, E.M., Glenn, C.R., Kleiman, E.M. & Nock, M.K. (2018), Annual Research Review: Suicide among youth – epidemiology, (potential) etiology, and treatment. J Child Psychol Psychiatr, 59: 460-482. doi:10.1111/jcpp.12831

Further reading:

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Dunlop, S.M. et al. (2011). Where do youth learn about suicides on the Internet, and what influence does this have on suicidal ideation? Journal of Child Psychology and Psychiatry, 52, 1073–1080.

Fergusson, D.M et al. (2008). Exposure to childhood sexual and physical abuse and adjustment in early adulthood. Child Abuse and Neglect, 32, 607–619.

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