Scotland's Suicide Prevention Action Plan

National Suicide Prevention Leadership Group
Every Life Matters Suicide Prevention Action Plan
Academic Advisory Group

Distinguishing between types of suicidality in young people and predicting escalation of suicidality in adulthood

(Action 7)

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Contents

1. Introduction

Scotland's National Suicide Prevention Leadership Group (NSPLG) was established in September 2018 by the Scottish Government to support the delivery of the Suicide Prevention Action Plan (SPAP; Scottish Government, 2018). Two of the ten Actions within the SPAP are to develop effective suicide prevent methods for at risk groups (Action 7) and to consider the needs of children and young people (Action 8). In July 2021, NSPLG Delivery Leads for Actions 7 and 8 submitted a request for research support to the Academic Advisory Group. As reformulated on 22 October 2021, the research questions were as follows:

1. What differentiates suicidal ideation, suicidal behaviours, suicidal self-harm and non-suicidal self harm in young people (15-25 years old)?
2. What factors may influence escalation of these experiences into adulthood? (i.e., increased severity of self-harm or suicide death)?

2. Methods

The search strategy and search terms can be found in appendix 1. All types of 'suicidality' were included within the search, including suicidal ideation, suicidal behaviour, suicide attempt and suicide death. Included articles were those which: i) were either a review or a primary study using a longitudinal or cohort design; ii) were published since 2020 (restricted to the most recent years due to the vast number of studies to screen); iii) addressed any type of suicidality; and iv) included participants aged 15-25 years old. Excluded papers were those which: i) explored use or possession of firearms (as they are not widely accessible in Scotland); ii) did not permit the extraction of age-relevant data; or iii) either did not explore at least two forms of suicidality at 15-25 years of age (thereby addressing research question one) or did not explore characteristics present at 15-25 years of age in relation to at least one form of suicidality in adulthood (to address the second research question).

3. Results

Studies included in this report are summarised in appendix 2. Most studies were excluded during the full-text screening stage because they did not contain extractable data relating to young people aged 15-25 years (average age). Research data are reported as presented in the original articles (e.g., hazard ratio, HR; odds ratio, OR) with 95% confidence intervals (95% CI), where reported. The findings of the report are presented for each research question separately. Within each sub-heading, traits and characteristics explored in relation to suicidality were grouped by overarching characteristics.

3.1. Factors which differentiate between types of suicidality in young people

To address the first research question, findings from studies exploring at least two types of suicidality in young people are presented. Two characteristics were identified and are summarised below.

3.1.1. Family and socio-economic status

A cross-sectional study by Kim et al. (2020), exploring suicidality in 12–18-year-olds in South Korea, found low socio-economic status was significantly associated with experiencing suicidal ideation (OR= 2.13) and suicide attempt (OR= 1.77) compared to mid- or high-socio-economic status.

3.1.2. Academic attendance

A meta-analysis (based on nine studies, mostly relating to Africa or Asia) by Epstein et al. (2020) showed that school absenteeism was associated with an increased instance of self-injury (including suicide death; OR= 1.37, 95% CI: 1.20–1.57) and suicidal ideation (including suicide planning; OR 1.20, 95% CI 1.02–1.42) in students aged between 11 to 21 years old. However, there was no statistically significant difference between the prevalence of suicidal ideation compared to self-harm.

3.2. Factors which may influence escalation of suicidality in young people

To address the second research question, findings from longitudinal studies and reviews which investigated associations between characteristics in young people and suicidality at a future date are summarised below. Overall, nine characteristics were identified.

3.2.1. Demographics

A Spanish study conducted by Sánchez-Teruel et al. (2020) found that women (OR= 6.22, 95% CI: 6.03-7.11) and those aged 21-22 years old (OR= 4.71, 95% CI: 4.29- 5.73) were more likely to engage in self-injury within 12-months of self-injury at baseline than men or those aged 15-20 or 23-24 years old. Epstein et al. (2020) conducted a review of 32 studies (mostly based in the US and Europe). This review identified a cohort study where Hispanic or White females aged 14–17-year-olds were significantly more likely to engage in a suicide attempt in adulthood (<46 years old) than black, ethnic minority or male populations.

3.2.2. Socio-economic status

Using self-report measures, a Danish study by Carr et al. (2020) found that 11% of 15-year-old participants who reported parental unemployment self-harmed between the ages of 15- and 35 years. In comparison, only 3.7% of age- and gender-matched controls with no self-harm history at 35 years old reported parental unemployment at 15 years.

3.2.3. Academic ability and student status

Sörberg Wallin et al. (2020) followed up two Swedish cohorts (born in either 1950 or 1970) from age 13 to age 26 years. Grade Point Average (GPA), a measure of academic ability, was lower in participants who were admitted to overnight hospitalisation following first suicide attempts (captured via the National Inpatient Register) when aged 26-46 years than those with a higher GPA (HR= 0.85, 95% CI 0.73 - 0.99). Sánchez-Teruel et al. (2020) found that students in Spain (mean = 20.3 years, *sd.* 4.56) were more likely to report a new episode of self-injury within 12 months of baseline self-injury (OR= 2.99, 95% CI: 1.58-6.01) compared to non-student age peers.

3.2.4. Mental health

Various aspects of mental health were investigated across several papers included in this report.

Findings are summarised under three subheadings: 'trauma', 'other personal mental health', and 'family mental health'.

3.2.4.1. Trauma

Several articles investigated trauma in relation to later suicidality (Angelakis et al. 2020; Miché et al., 2020; Valencia-Agudo et al., 2020). Using semi-structured interviews, Miché et al. (2020) explored trauma (physical attack, sexual assault, serious accident or witnessing a trauma) in relation to suicide attempt in young people aged 14-24 years in Germany. All forms of trauma measured by Miche et al. were significantly associated with suicide attempt 7.3-10.6 years later, with sexual abuse being associated with the greatest increased risk overall (rape or sexual abuse, HR= 9.6, 95% CI: 4.7–19.3; physically attacked, HR= 3.8, 95% CI: 2.3–6.2; serious accident, HR= 3.1, 95% CI: 1.7–5.7; witnessed trauma, HR= 2.3, 95% CI: 1.1–4.5). A study included in the review by Epstein et al. (2020) identified a significant increase in the likelihood of suicide attempt by age of 21 in participants who reported a history of trauma between the ages of 14 and 17 compared to controls with no trauma history (OR= 4.07, 95% CI: 2.45–6.74) . A worldwide meta-analysis of 79 studies by Angelakis et al. (2020) found that, compared to those with no history of trauma, all forms of trauma assessed (sexual, physical, emotional; baseline age, mean= 15.67, *sd.* 2.11) were associated with suicide attempt (OR= 3.38, 95% CI: 2.09 – 5.47) and suicidal ideation (OR= 4.12, 95% CI: 2.44-6.95) in adults at least 24 years of age. Similar to Miché et al. (2020), of all the forms of trauma explored by Angelakis et al. (2020), sexual abuse was the most predictive of later suicide attempt (OR= 3.41, 95% CI: 2.9 - 4.0), suicide planning (OR= 4.12, 95% CI: 2.44-6.95) and suicidal ideation (2.46, 95% CI: 2.08 – 2.90).

A prospective study by Valencia-Agudo et al. (2020) found that the prevalence of self-harm in England during the 12 months prior to sexual assault in young people (13-17 years old, median: 15.6 years) was similar to the prevalence in the 12 months following assault. The associated risk of post-trauma self-harm did not vary between ethnicity or socio-economic groups. However, if there was more than one assailant, the likelihood of self-harm increased substantially (χ^2 (1,97) = 7.56, p<0.01). Among participants who engaged in self-harm following sexual assault, the main reasons given for doing so were to ease emotional pain (58%) and wishing to die (37%).

3.2.4.2. Other personal mental health

Sánchez-Teruel et al. (2020) investigated young people aged 15-25 years old who presented to hospital triage nurses with self-harm. According to medical records, young people who reported a history of anxiety (OR= 6.12, 95% CI: 5.43-7.21), being a victim of bullying (OR= 7.76, 95% CI: 5.69 - 8.89), self-injury via cutting (OR= 2.18, 95% CI: 1.62 -.45) or being discharged from a hospital emergency room (OR= 4.53, 95% CI: 4.11 -.23) during their initial hospital presentation were significantly more likely to re-present to hospital with new self-harm injuries within the following 12 months.

3.2.5. Family mental health

A review of 34 studies (most were based in North America) by Hill et al. (2020) indicated that, compared to controls with no exposure of suicide at baseline, exposure to a suicide death (of a friend, family member or acquaintance) was linked with higher risk of suicide death (OR = 3.23, 95% CI: 2.32 - 4.51) or attempt (OR = 2.91, 95% CI: 2.01 - 4.23) but not suicidal ideation in young people aged <25 years. Hill et al. (2020) also found that exposure the suicide attempt of both parents among young people was associated with suicide attempt before turning 25 years old (five-year follow-up; OR = 3.53, 95% CI: 2.63 - 4.73). The odds ratios among youths who had been exposed to

the suicide attempt of one parent were 2.89 and 3.89 (for paternal and maternal exposures, respectively). A longitudinal study by Miché et al. (2020) found that, among 14–24-year-olds, any parental mental health diagnosis (past or present) was significantly associated with suicide attempt at follow-up (10-12 years later, OR= 1.32)

3.2.6. Drug use

A Swedish cohort study (Hengartner et al. 2020) investigated the association between adolescent cannabis use and suicidality during the subsequent 35 years (until the age of 50 years). Based on life-time cannabis use at 19-20 years old, the odds ratio of suicidality (intense suicidal ideation, suicide planning and/or suicide attempt) before 50 years old was significantly greater in those who used cannabis at baseline compared to those who did not (OR= 1.64, 95% CI: 1.09; 2.48), with cannabis use at baseline significantly correlated with suicidality at 20-21, 22-23 and 34-35 years old. Age differences were related to this association: whereas odds ratios (adjusted for demographics, education, social support, financial status and other substance use) revealed that adolescent cannabis use in those up to age <16 years was not significantly associated with later suicidality, cannabis use between 16-20 years old was associated with later suicidality (OR=1.84, 95% CI: 1.1-3.08). There was an association between cannabis use between 1 and 10 times during adolescence and later suicidality (OR= 1.72, 95% CI:1.03; 2.87), but not among those who used cannabis during adolescence more than 10 times (OR= 1.39, 95% CI: 0.77; 2.50).

3.2.7. Social Support

Scardera et al. (2020) found the greater the extent of self-reported social support (10-item Social Provision) at 19 years, the lower the prevalence of self-reported suicidal ideation (OR= 0.59, 95% CI:0.50 - 0.70) and suicide attempt (OR: 0.60, 95% CI: 0.46 - 0.79) at 20 years (after controlling for gender, mental health history, personality traits and family factors).

3.2.8. Social media use

Based on self-reports from Chinese school students (14.59 years, *sd.* 1.45), Wang et al. (2020) found significant associations between over two hours of daily internet use (OR = 1.86, 95% CI = 1.25-2.76) or mobile phone use (OR = 1.46, 95% CI: 1.02-2.10) and more than one episode of self-harm during the subsequent 12 months. A German online study by Brailovskaia et al. (2020) found that 'Facebook Addiction Disorder' (assessed using the Bergen Facebook Addiction Scale) was significantly associated with suicide attempt one year later.

3.2.9. Suicidality history

A meta-review of predictors of suicide attempt by Paris (2021) reported that the estimated rate of suicide death is approximately 9% across a nine-year follow-up in those aged <30 years old who engage in self-harm. A review by Borschmann et al. (2020) cited Hawton et al. (2020), who concluded that self-injury in 10–18-year-olds was significantly associated with later suicide death in adulthood (OR= 2·11, 95% CI: 1·17–3·81). The same review also found that the incidence of suicide in the 12 months following emergency department presentation of self-harm was 31 times higher (95% CI 18·2–30·9) than that expected in the general population of 10–18-year-olds residing in the UK without self-harm presentations.

4. Discussion

This report addresses two research questions. The first question aimed to identify personal characteristics which differentiate between types of suicidality (e, g., ideation, non-suicidal self-harm, suicide attempt) among young people. This report has identified two such characteristics: socio-economic status and academic attendance. The results showed that low socio-economic status was more commonly associated with suicidal ideation and suicide attempt, while school absenteeism was associated with self-injury and suicidal ideation.

The second research question aimed to identify factors which might escalate lethality of suicidality in young people as they move into adulthood. Nine potential factors were identified, although only three of the included papers measured more than one form of suicidality. Social support was the only factor found to be protective of subsequent suicidal ideation and suicide attempt.

The most commonly investigated factor was trauma in young people. The nature of the trauma was associated with varying likelihood of self-harm and suicide attempt in adulthood. However, one study investigated suicidality 12 months before and after sexual trauma, with the results showing no significant difference in prevalence of self-harm, while another found sexual trauma was far more predictive of later self-harm than of suicidal ideation. A number of other aspects of mental health were also associated with later self-harm and suicide attempt, with both parents attempting suicide being associated with the greater likelihood of later suicide attempt, while discharge from hospital emergency departments was most predictive of later self-harm in young people.

The research here suggests that those who engage in self-injurious behaviour are likely to have already done so in the past and, compared to the general population, those who engage in self-injurious behaviours are at increased risk of suicide death. There may be key ages when self-injury is most likely to occur, specifically, the early 20s and mid-30s. Age-specific cannabis use and frequency was also found to be associated with later suicidal behaviours. Other prospective risk factors included social media use, academic ability and student status, and socio-economic status, where elevated social media use, and disadvantaged economic status and academic ability were associated with later suicidal behaviour.

4.1. Limitations

Several limitations should be considered when applying these findings to the development and implementation of suicide prevention strategies. First, cross-sectional studies, and studies which only investigated one form of suicidality in young people were excluded, as these would have been identified as risk factors which were investigated in a separate report produced by the AAG in October 2021 (NSPLG, unpublished). Second, most of the studies included here were not reviews, and the reliability of the findings has not been established. Third, very few of the included studies explored existing suicidality in young people and how this developed over time. This may be due to the volume of participants (and research resources) needed in order to capture robust data for analysis. Fourth, no studies explored volitional factors of suicide behaviour, apart from suicidal ideation, planning, attempt or self-harm history. There is research evidence, however, that other factors can increase the likelihood of suicidal ideation developing into suicidal behaviour, including impulsivity and risk-taking behaviour, but these factors were not present in the studies included here. Fifth, many studies were excluded during abstract screening because they assessed characteristics in childhood (typically ≤16 years old) in relation to suicidality in middle adulthood or older, thereby bypassing the target average age of participants for the current report. Sixth, this report was developed for the purposes of informing possible suicide prevention approaches in the

Scottish population. However, no studies included here specifically focused on Scottish populations, and very few studies or reviews included UK participants. Finally, longitudinal studies did not explore age groups beyond the age of 50 years.

4.2. Future research

More research is needed which explores suicidality in young people, especially using UK-based populations. Furthermore, it would be helpful to assess links between risk factors in young people across the life-course, including different types of suicidality in older adulthood.

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Wang, L., Liu, X., Liu, Z. Z., & Jia, C. X. (2020). Digital media use and subsequent self-harm during a 1-year follow-up of Chinese adolescents. *Journal of affective disorders*, *277*, 279-286.

Appendix 1. Search strategy

Database(s) accessed		Medline
Date of search		27th October 2021
S1	(MH "Suicidal Ideation") OR (MH "Suicide, Completed") OR (MH "Suicide, Attempted") OR (MH "Self-Injurious Behavior+") OR (MH "Suicide+") OR (MH "Self Mutilation")	76,016
S2	(MH "Cohort Studies+") OR (MH "Controlled Before-After Studies") OR (MH "Prospective Studies") OR (MH "Longitudinal Studies+") OR (MH "Follow-Up Studies") OR (MH "Case-Control Studies+") OR (MH "Retrospective Studies") OR (MH "National Longitudinal Study of Adolescent Health")	2,760,025
S3	Systematic review OR meta-analysis OR review	2,080,661
S4	S2 OR S3	4,622,322
S5	S1 AND S4	18,905
L1	English	17,618
L2	Major subject heading: self mutilation poisoning self-injurious behavior suicidal ideation suicide, attempted suicide	13,344
L3	Date published: 2020- present	1,162
Total titles screened		1,162
Total abstracts screened		166
Total full-text articles screened		77
Total included in report		13

S= search term; L= limitation; MH= Medline subject heading

Appendix 2. Study summaries

Author	Year	Study design/ Article type (no. studies)	Location	Participant age (years) at baseline	Follow-up	Outcome variable	Outcome assessment method
Angelakis et al.	2020	Meta-analysis (n= 79)	Worldwide	Mean= 15.67 (sd. 2.11)	NA	Suicidal ideation, attempt and self-harm	Various
Borschmann et al.	2020	Editorial	Worldwide	NA	NA	Suicide death	Hospital records
Brailovskaia et al.	2020	Longitudinal	Germany	Mean= 23.01 (sd. 4.45, range: 12 – 18)	1 year	Suicidal ideation and attempt	Online survey
Carr et al.	2020	Cohort	Denmark	15	20 years	Self-harm	National Patient Register
Epstein et al.	2020	Review Meta-analysis (n=12)	Worldwide	11 - 21	NA	Suicidal ideation and self-harm	Various
Hengartner et al.	2020	Cohort	Switzerland	19 - 20 (based on characteristics at 15-16 years old)	30 years	Suicide ideation, planning and attempt	DSM-III-R
Hill et al.	2020	Review and meta-analysis (n= 34)	Worldwide	<25 years	1-5 years	Suicide attempt/ death	Hospital records/ death certificate

Kim et al.	2020	Cross-sectional	South Korea	Mean= 15.46 (sd. 1.72, range 12 - 18)	NA	Suicidal ideation and attempt	
Miché et al.	2020	Longitudinal	Germany	14 - 24	10-12 years	Suicide attempt	M-CIDI/ DIA-X (semi-structred interview)
Paris	2021	Meta-review	Worldwide	NA	NA	Suicide attempt and death	Various
Sánchez-Teruel et al.	2020	Longitudinal	Spain	19-20	1 year	Self-harm	Hospital records
Scardera et al.	2020	Longitudinal	Quebec, Canada	15 - 17	At 20 years	Suicidal ideation and attempt	Two single-items
Sörberg Wallin et al.	2020	Longitudinal	Sweden	Median= 15.60 (range 13 - 17)	< 21years	Suicide attempt	National Inpatient Register
Valencia-Agudo et al.	2020	Longitudinal	London, UK	Mean= 14.59 years (SD = 1.45)	< 5 months	Self-harm	Hospital records
Wang et al.	2020	Longitudinal	China	23.01 (4.45)	1 year	Self-harm	Single item question

Recommended citation:
McClelland, H. (2021). *Distinguishing between types of suicidality in young people and predicting escalation of suicidality in adulthood*. Unpublished manuscript.

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