


## Review Article

# Prevalence of self-harm among children and adolescents in the Republic of Ireland: a systematic review

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### Abstract

**Objectives:** Youth self-harm (SH) is viewed as a public health concern and one of the main reasons for urgent psychiatry assessment. This systematic review sought to establish prevalence of SH among youth in Ireland.

**Methods:** A systematic review using pre-defined search terms was conducted (Jan 1980–March 2024).

**Results:** From a total of 204 papers identified, 18 were included. Significant variation in rates of SH was found. Limiting data to adolescent years (15–18), best estimates for overall lifetime rates of SH ranged from 1.5% (when rates of SH were reported based on a two-stage study design), to 23% (where SH was limited to non-suicidal SH). SH was typically higher in females, impulsive in nature, and occurred in the home setting. Whilst almost half of youth sought help before (43.7%) or after (49.8%) the SH episode, this was most often to a friend or family member. Overall rates of professional help seeking were low.

**Conclusions:** Robust studies using clear definitions of terms, separately capturing SH with and without suicidal intent, and distinguishing SH in the context of a mental illness, are required to inform service developments. Given the frequent occurrence of SH among youth accompanied by predominance of help seeking via friends and family, it is imperative that psychoeducation is delivered to families and peers. Out of hours community and specialist mental health services are essential to address this important issue.

**Keywords:** Ireland; self-harm; suicidal ideation; systematic review youth

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### Background

There have been dramatic increases in incidence and prevalence of self-harm (SH) in youth over time (King, 2020). Suicide is one of the main causes of death in this age group (UNICEF, 2021), and SH is one of the main risk factors (King, 2020). National (HSE, 2020) and international (WHO, 2021) policies have highlighted the importance of addressing this problem. Internationally, research has suggested SH behaviours occur in some 23% of adolescents (Gillies et al., 2018), and when co-occurring suicidal intent is considered, rates reduce to 6–8% (Lim et al., 2019). Ireland continues to have high rates of youth suicide (3.94/100 000) (Suicide Statistics 2019, 2022) internationally (Glenn et al., 2019), and it is associated with adverse psychological consequences for family, friends and communities as well as far-reaching social and economic costs (Doran and Kinchin, 2020).

The Child and Adolescent Mental Health Services (CAMHS) are statutory publicly funded services overseen by the Health Service Executive (HSE) to provide treatment of individuals aged from five to 18 with moderate to severe mental health disorders. Although SH is not always associated with a mental illness, it is often a reason for referral to CAMHS. Therefore, understanding rates of adolescent SH and suicidal behaviour (and potential increases over times), and the extent to which these occur in the context of a mental illness, is of crucial importance to service planning. This is even more important, given the implications of demands on already overstretched specialist mental health (MH) services. However, data in Ireland is limited, and quantifying rates of SH can be challenging, an issue that is exacerbated by variations in reporting and terminology (Wilson and Ougrin, 2021). Gathering accurate information on SH is more difficult, due to its transient nature and lack of a definitive behavioural correlate. Despite these challenges, for the purpose of service, accurately identifying the prevalence of youth self-harming behaviour is vital. The research team reflected on the considerations and implications of the use of a narrow *versus* broad search term to capture SH and whether to include suicidal ideation. A broad search term was used, Self-harm, to reflect a discrete or definitive behaviour, but without

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classification by presence or degree of intent, or without regard to motive to allow the fullest possible capture of relevant self-harm data. This facilitated a focus on any act of self-harm irrespective of intent or method as outlined below.

## Aims

The aim of this systematic review is to present robust data on rates of SH in children and adolescents in the Republic of Ireland.

## Methods

This study followed a similar methodology to a prior systematic review examining prevalence rates of any mental health difficulties in youth under 18 living in Ireland (Lynch et al., 2023). Whilst the original search identified papers with SH, differences in terminology, definition and timeframes made it very difficult to combine data, and a decision was made to conduct a separate review.

This review adopted search terms relating to SH used in a Cochrane Review of interventions for SH in children and adolescents (Witt et al., 2021). The search date for this study was 1980 to March 2024.

A systematic search was conducted using the following databases, Embase, PubMed, PsycInfo and CINAHL, to retrieve literature on prevalence of SH in children and adolescents in Ireland. Search terminology is presented in Table 1.

### Word searches restricted to title and abstracts

Past issues of Irish peer-reviewed publications (*Irish Medical Journal*, *Irish Journal of Psychological Medicine*, *Irish Journal of Medical Science*) were hand-checked from January 1980 to March 2024, and references of included studies were also checked to identify any additional relevant studies. A search of grey literature was conducted, focusing on studies on the wellbeing of children and adolescents in Ireland which may have included data on SH. The CoCoPop Framework (Condition, Context, Population) assisted in the search methodology, and a PRISMA Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flow diagram documented study selection process, with inclusion and exclusion details listed. The Joanna Briggs Institute (JBI) criteria were independently applied to evaluate the study risk of bias.

Using Covidence™, two independent researchers screened titles, abstracts and full text articles with any disagreements mediated through a third team member. The systematic review was further developed from the original review registered in PROSPERO (the International Prospective Register of Systematic Reviews). For this paper, only studies with empirical data for youth under 18, conducted in ROI, and documenting rates of SH were included. Duplicates were excluded using Covidence™. Similar to the previous study (Lynch et al., 2023), reasons for exclusion at full text review were documented as either no quantitative data for ROI (reason 1) or population drawn from a specific vulnerable group or clinical setting and not the general population (reason 2) (Figure 1). Given the existence of a National Self-Harm Registry Ireland (NSHRI) for youth presenting to hospital settings with SH, reports from this register were scanned for the most up to date data. Additional publications based on data from the NSHRI were therefore not included unless providing additional relevant sub-analysis. The following data were extracted: study author(s), publication year, study population, sample size, prevalence/incidence, study design, year of publication and of data collection,

**Table 1.** Search strategy

Category 1: 'child*', 'adolescen*', 'pediatric', 'youth', 'teen*', 'young'
Category 2: 'Ireland', 'Irish'
Category 3: 'self-harm*', selfharm*, suicid*, parasuicid*, 'auto mutilat*', automutilat*, 'self destruct*' selfdestruct*, 'self immolat*', selfimmolat*, 'self inflict*', selfinflict*, 'self injur*', selfinjur*, selfmutilat*, 'self mutilat*', 'self poison*', selfpoison*, 'head bang*', headbang*, NSSI*, nonsuicid*, non-suicid*, overdose*
Proximity search for 'self' appearing within 2 words of the following: cut, cuts, cutting, cutter, burn, burns, burning, bite, bites, biting, hit, hits, hitting
Category 4: 'incidence', 'prevalence', 'epidemiology'

sample size and age of cohort. Definition of SH and prevalence rates found are reported. Although, not specifically searched, when rates of SI were given alongside rates of SH, these were also reported. A narrative approach was utilised to summarise the findings grouped according to main cohorts examined.

## Results

A total of 13 studies met study inclusion from a systematic search of identified databases, two were identified from manual searches, with a further three reports from the grey literature. As some papers reported on the same study population, the data were therefore grouped according to the main cohorts examined (e.g. National Self-Harm Registry Ireland (one paper and the most recent annual report), Child and Adolescent Self Harm in Europe (CASE) Study (four papers), Saving and Empowering Young Lives in Europe (SEYLE) Study (two papers), My World Survey 2 (one report), Growing Up in Ireland Cohort (one report), Challenging Times (two) and six other regional studies, including one of a 1-year follow-up). Where there were multiple papers from the same cohort, papers were included only if they provided new material not already supplied by a previous paper. Table 5 details a summary of all included studies ( $N=18$ ) and the quality assessment score.

### Self-harm presentations at hospitals

While data based on hospital attendance do not capture prevalence rates of SH in youth, they do provide some insight into trends over time and the nature of SH. The National Self-Harm Registry Ireland (NSHRI) (Joyce et al., 2020), funded by the HSE's National office for suicide prevention, represents the world's first national registry on intentional SH hospital presentations for all ages. Yearly reports are published giving insight into changing patterns for SH and rates of presentation to hospital emergency departments in ROI. Data on youth under 16 have been captured since 2006.

The definition of SH used by the registry accords with that of the World Health Organization (WHO) (see Table 2) and frequently used by other countries' register and cohort studies. Reasons for engagement in SH are not required as part of the definition and reflect SH both with and without suicidal intent.

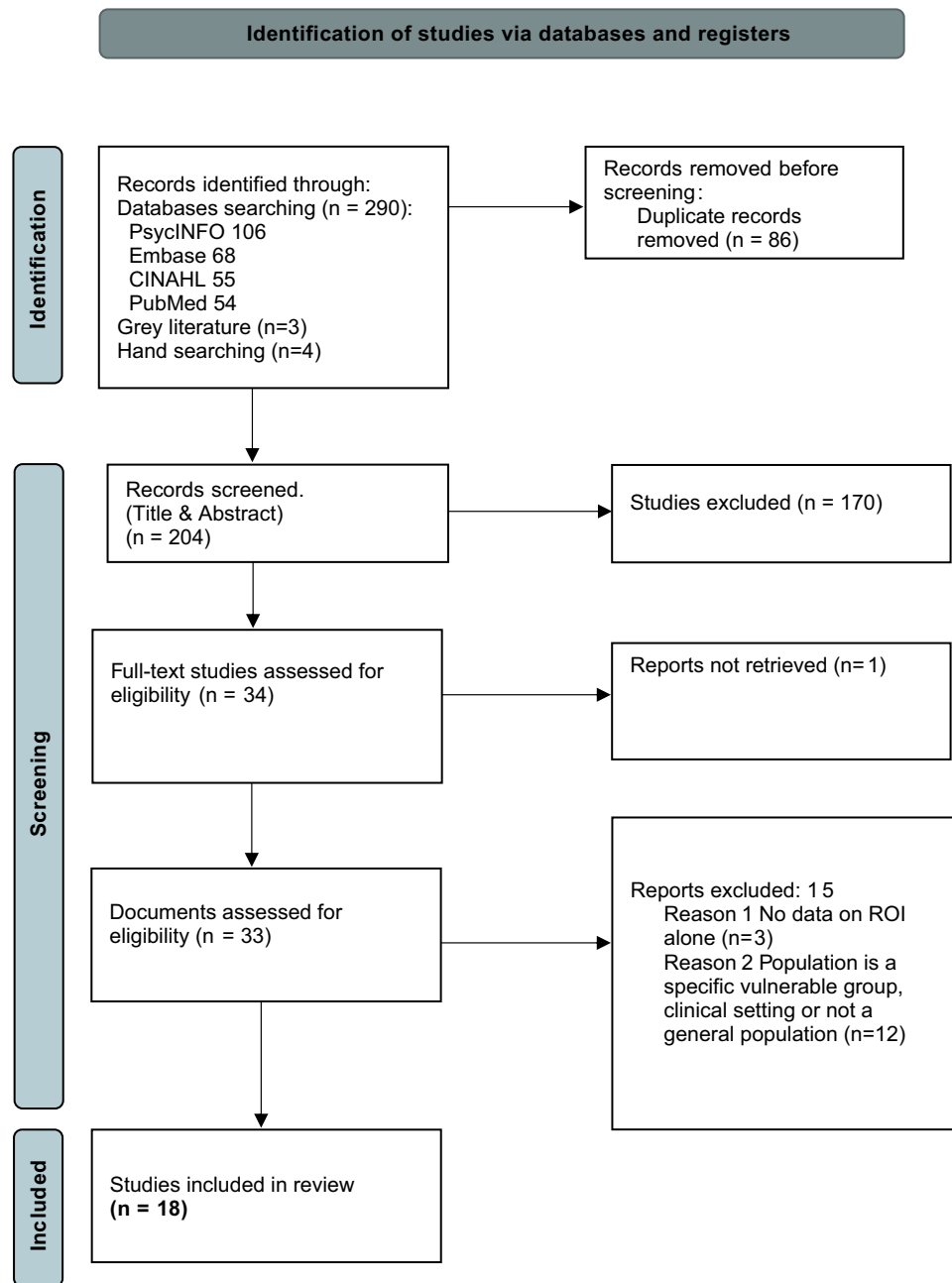
Cases presenting with SH to the hospital are carefully recorded to allow for deduplication. To calculate up-to-date rates, the Central Statistics Office population estimates are used. Crude and age-specific rates per 100 000 populations are provided. At the time of writing, the most recent published report that has included data on youth is for 2020 (Joyce et al., 2022). This is the NSRF's 19<sup>th</sup>

**Table 2.** Definition of definition of SH used in NSHRI

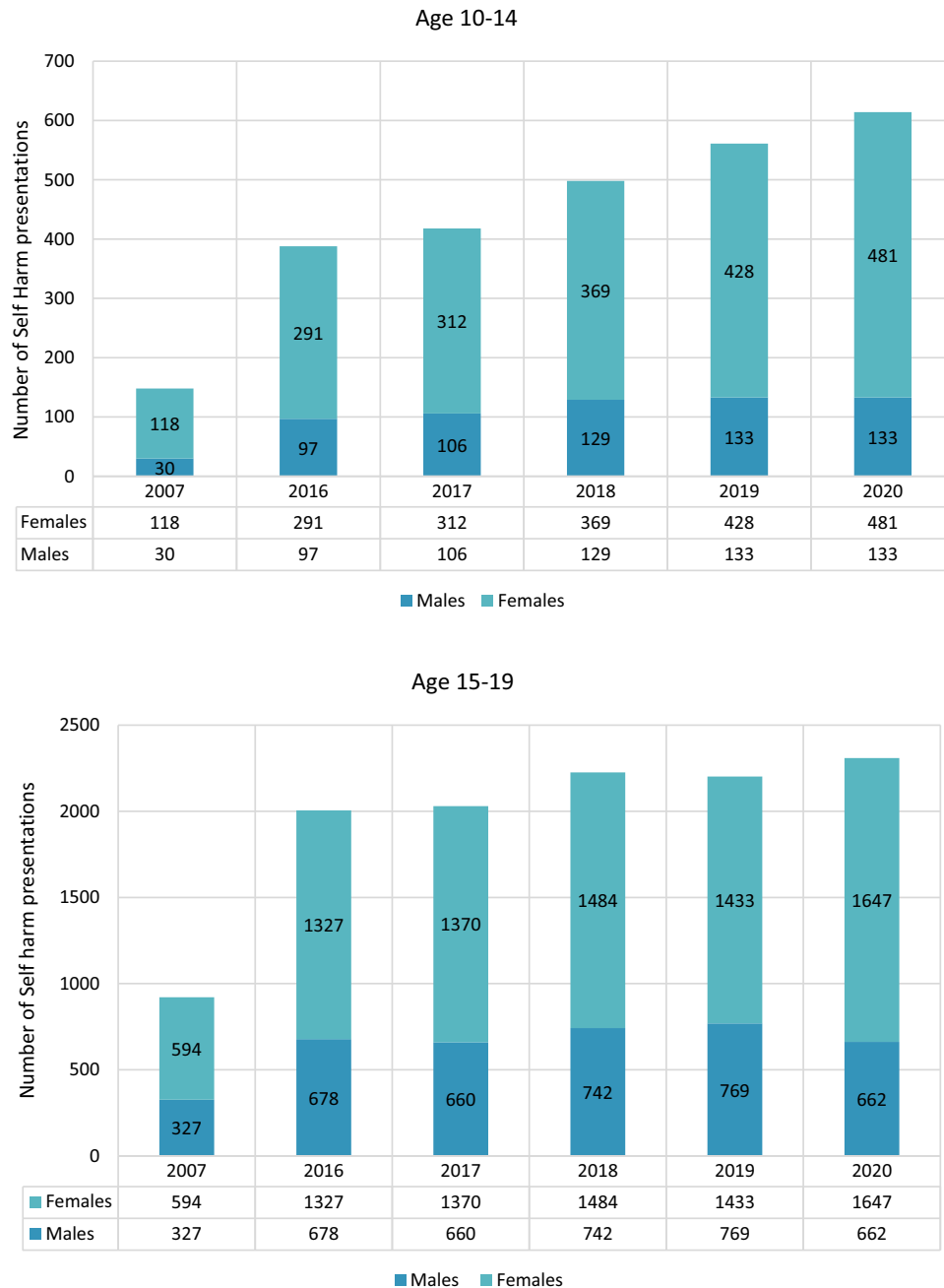
An act deliberately initiated by the individual, with non-fatal outcome, designed to cause self-harm, unless intervention is offered by others.
Includes the deliberate ingestion of a substance more than prescribed levels or known to be likely to result in harm.
Methods also include cutting, attempted drowning, or hangings.
Although alcohol overdoses are included, recreational use of alcohol or other substances, even if to excess is not considered as SH under the definition applied.
There is no presumption about the motives or intent or whether suicidal ideation is present or not.

report and covered 31 of the 33 hospital emergency departments (EDs) including the three national paediatric hospitals. As mentioned, the primary limitation of the NSRF data is that only those who attend a public hospital setting are captured. A time delay exists due to delay in data capture and report publication linked to difficulties accessing hospital sites during the Covid-19 pandemic and further compounded by the cyberattack on the HSE in May 2021.

In 2020, rates of SH among 10–14-year-olds were 614/100 000 and 2309/100 000 for 15–19-year-olds. In 2020, the peak age was 16 years compared to aged 19 in 2019. Adolescent females aged 15–19 years were twice as likely as males to present to hospital



**Figure 1.** PRISMA; reasons for exclusion: 1=Population not ROI or can't separate; 2= population is a specific vulnerable group, clinical setting or not a general population.



**Figure 2.** NSRF gender and age profile of SH presentations to emergency department (data taken from NSRF reports 2007–2020).

following SH (779 *v.* 316 per 100 000) occurring at a frequency of one in every 128 females. The female preponderance among 10–14-year-olds was even more extreme, at three times the male rate (234 *vs* 71 per 100 000).

In addition to the published NSRF annual reports, the systematic review identified one published paper reporting on rates and methods of hospital treated SH in the paediatric population over a 10-year period (2007–2016) (Griffin *et al.*, 2018). Over the study period, rates of SH increased by 22%, most evident in females and those aged 10–14 years (Griffin *et al.*, 2018). Extending these rates to 2020 (Joyce *et al.*, 2020) shows only a marginal and non-significant increase among the age group 16–19 (rates of 2005/100 000 in 2016 compared and 2309/100 000 in 2020). However, there was a significant increase in rates of SH in

younger children, 10–14 (rates of 388/100 000 in 2016 compared to 615/100 000 in 2020) (Figure 2). Rates in 2020 were also 8% higher than in 2019, again driven mainly by an increase among the 10–14-year-old group (Joyce *et al.*, 2020).

The various methods of SH were also explored. Drug overdose was the commonest method in both age groups; 58.6% of the 10–14-year-old cohort and 66.6% of the 15–19-year-old group. Cutting occurred in 31.6% and 29.6%, respectively.

#### *Child and adolescent self-harm in Europe (case) study*

The Child and Adolescent Self-Harm in Europe (CASE) study was a large cross-sectional study carried out in Australia and six European countries: Belgium, England, Hungary, the Netherlands,

Norway and Ireland (Madge et al., 2008). Datasets were age weighted to take account of differing age profiles in national samples. A total of 30 477 young people aged 15–16 completed the Lifestyle and Coping Questionnaire, with 3804 youth (1873 male and 1931 female) from schools in Cork and Kerry (85% response rate) (Madge et al., 2008). Youth were asked to report if they had ever self-harmed and if so, to provide a description of the act, allowing the researchers to categorise them by act. The researchers then applied a pre-determined study definition for SH similar to that used by the NSRF (see Table 2), therefore including SH with and without suicidal ideation (SI). Rates of SH are presented based on lifetime rates, past year and past month and repeat attempts. In addition, thoughts of self-harm (TSH) were also recorded. Motives for SH were captured, and the young person was asked if they had informed any one before/after the event and whether they attended hospital or other services. Four papers were identified in the systematic review detailing prevalence rates of SH/SI in Ireland (Madge et al., 2008, McMahon et al., 2010, 2014; Morey et al., 2008.), with Madge et al. (2008) providing the most granular prevalence rates for Ireland by gender, whilst Morey et al. (2008) provide total rates and motives.

Morey and colleagues (2008) outline the methodological aspects of the CASE study as applied to Ireland. Thirty-nine of a possible 54 schools in Cork and Kerry took part. A total of 4583 students aged 15–17 years were eligible of whom 3881 participated (85% response rate). Some cases were excluded due to incomplete or spoilt questionnaires, so the final sample for most analyses was:  $N = 3830$  (Morey et al., 2008). Two groups of SH were identified, a broad SH concept, based on any self-report endorsement of SH, and another using a predetermined classification for SH. Prevalence data are provided for each group.

For the 458 respondents who self-reported any SH, lifetime rates were 11.95% (458/3747), past year SH 7.1% (266/3747), and past month 2.2% (83/3747). Using the standardised study definition of SH, these rates reduced somewhat to a lifetime rate of 9.1% (333/3646), past year SH prevalence 5.7% (208/3646) and past month 1.8% (65/3646). Questions were also asked about thoughts of SH (TSH) in the past year and month. 21.6% (807/3732) endorsed past year TSH and 8.4% (313/3732) past month. Rates of TSH were twice as likely (relative risk 2.3) to occur in girls (29.9%) compared to boys (13.2%). Morey and colleague reported that of those who harmed themselves, 45.9% had harmed more than once (Morey et al., 2008).

Gender-specific prevalence CASE study data are also presented by Madge et al. (2008). This highlights the increased rate among females (13.9%) compared to males (4.4%) for lifetime rate. 8.8% of females and 2.4% of males reported they had engaged in SH in the past year, and 2.3% of females and 1.3% of males in the last month (Table 3) (Madge et al., 2008). Prevalence of thoughts of SH were present among 21.9% of females and 11.8% males, respectively. Madge and colleagues also reported on methods, with cutting being the commonest method of SH overall (55.9%). Almost half (45.5%) of SH episodes were considered impulsive (where the decision was made within an hour) (Madge et al., 2008).

Although somebody else was most likely to be aware of the SH episode (80.1%), and home was most often the setting (91.8%), Madge and colleagues highlighted that only 8.5% of all SH acts resulted in a hospital presentation. Among Irish youth, alcohol was found to be involved in 18.9% of the time and illicit drugs in 11.8% (Madge et al., 2008).

Reasons for SH were examined and presented for the Irish sample in Morey et al. (2008) and for the entire CASE sample in

**Table 3.** CASE prevalence rates split by gender and country

	Lifetime SH	Past year SH	Past month SH	Past year TSH	Repetition SH
Total	9.22% <sup>1</sup> 9.1% <sup>2</sup> 8.78% (C)*	5.66% <sup>1</sup> 5.7% <sup>2</sup> 5.67% (C)*	1.81% <sup>1</sup> 1.8% <sup>2</sup> 1.78% (C)*	16.54%* 21.6% <sup>2</sup> 15.58% (C)*	60.2% <sup>1</sup> 45.9% <sup>2</sup> Range given 44.4%–62.4% (C)
Female	13.9% <sup>1</sup> 13.5% (C)	8.8% <sup>1</sup> 8.9% (C)	2.3% <sup>1</sup> 2.6% (C)	21.9% <sup>1</sup> 29.9% <sup>2</sup> 21.5% (C)	
Male	4.4% <sup>1</sup> 4.3% (C)	2.4% <sup>1</sup> 2.6% (C)	1.3% <sup>1</sup> 1.0% (C)	11.8% <sup>1</sup> 13.2% <sup>2</sup> 9.9% (C)	

Notes: Data extracted from CASE study. (Madge et al., 2008). Full sample  $N = 30,476$ , 49% F ( $n = 14,848$ ) and 51% M ( $n = 15,628$ ), of which Republic of Ireland (ROI) data:  $N = 3,804$  51% F ( $n = 1,931$ ) and 49% M ( $n = 1,873$ ), CASE average rates where available, are presented in (C). <sup>2</sup>Additional data extracted from Morey et al., 2008 ( $N = 3646$ ), based on ROI CASE SH categorisation. \*Weighted calculations made by the research team to generate total rates given different rates/population size by gender; males ( $N = 1873$ ) and females ( $N = 1931$ ).

Madge et al. (2008). The most common reason given for engagement in SH was to get 'relief from a terrible situation' (78.9%) (Morey et al., 2008). Although a significant number (60.9%) also endorsed a wish to 'die', this was never given as the sole reason for SH. Specific risk factors were examined. There was no significant difference in rates of SH by age, but girls were three times as likely ( $RR = 3.2$ ) to harm themselves than boys (Morey et al., 2008). Living in either a single parent family ( $RR = 1.8$ ) or with one parent and a partner/step-parent ( $RR = 2.2$ ) was also more likely than those living with both parents. The most common form of SH was by cutting (66%) followed by an overdose (35.2%). Whilst almost half of youth sought help before (43.7%) or after (49.8%) the SH episode, this was most often to a non-professional. 11.3% (36) were reported to have attended the hospital at some point following an episode of SH. This reduced to 8.3% when examining SH that occurred in the last year (Morey et al., 2008).

As Madge et al. (2008) delineated prevalence rates of SH in six other European countries and Australia, this allows comparative rates to be presented in Table 3. There were some geographical variations in rates and methods between some countries; Ireland was typically intermediate and did not differ significantly from other countries on either prevalence rate, method or motive. However, with regard to thoughts of SH, Madge et al. reported that boys in Ireland had a much higher rate (11.8%) compared to the total CASE sample (9.9%) (2008). Rates reported by Morey et al. with regard to boys were even higher (13.2%) (Morey et al., 2008). Rates of repetition in Ireland (60.2%) were considered high (along with Norway, 62.4%), compared to Hungary (44.4%), and higher than the EU average (54.21%). This rate (60.2%) as reported by Madge et al. is also higher than the rate of 45.9% reported by Morey et al. (2008). Ireland also differed to other countries in terms of lower rate of premeditation (45.4% Ireland compared to 48% total sample) and SH more often occurring at home (91.8% compared to 83.3%) (Madge et al., 2008). Ireland was also intermediate in terms of involvement of alcohol with the SH (18.9% compared to a lower rate in the Netherlands 12.1% and highest on Hungary 26.8%). Attendance at hospital post SH was also lowest in ROI compared to other countries; 8.5% of the Irish sample reported attendance at hospital compared to the average of 12.4% (Madge et al., 2008).

McMahon et al. (2010) also utilised the CASE dataset ( $n = 3808$ ) and examined risk factors associated with lifetime

SH. Risk factors shared between genders were of drug use and knowing a friend who had engaged in SH. Females had a higher risk if there was a family history of SH, family or peer difficulties, low self-esteem and past forced sexual activity. Risk factors for males included presence of anxiety, impulsivity, school-related academic difficulties and being a victim of bullying.

A further paper by McMahon et al. (2014) utilised the CASE dataset ( $n = 3881$ ) and presented community rates of SH in Cork and Kerry alongside incident rates of hospital-treated cases with data drawn from the NSRF. This was based on the number of persons 15 – 17 resident in the study region according to the 2006 census. Annual community SH rates per 100 000 were subsequently calculated with a 95% confidence interval. Using this method, the total incidence community past year SH rate was much higher at 5,551/100 000 (8,900 female, 2,400 male) compared to the annual incident hospital-treated SH as reported by the NSRF of 344.4/100 000 (438.1 female, 256.2 male).

### *Saving and empowering young lives in Europe (SEYLE)*

A later study, the SEYLE project was funded by the European Union and gathered data on health and wellbeing about European adolescents between Oct 2009 and Dec 2010 (Wasserman et al., 2015). Its primary aim was to evaluate the efficacy, cost-effectiveness, and cultural adaptability of various suicide-preventive interventions in schools. As part of this, it gathered baseline data which provide insightful prevalence data. This study comprised 11 000 adolescents (mean age  $14.5 \pm 0.9$ ) from randomised schools in 11 European countries: Austria, Estonia, France, Germany, Hungary, Ireland, Israel, Italy, Romania, Slovenia, Spain and Sweden. A total of 1,054 youth were recruited from Ireland. The study included a six-item questionnaire on SH, referred to as deliberate self-injurious behaviour (D-SIB) and defined as the intentional self-inflicted damage of the surface of an individual's body by self-cutting, burning, hitting, biting and skin damage by other methods. Furthermore, it utilised the Paykel suicide items (Paykel et al., 1974) which consist of five items that evaluate the presence of passive and active SI and behaviours over the past year. Unlike other studies reported here, the SEYLE project did not include SH by overdoses. Occasional 'Deliberate-SIB' was defined as 1–4 reported lifetime acts; repetitive D-SIB was defined as  $\geq 5$  previous events during lifetime, in keeping with the proposed diagnostic entity of non-suicidal self-injury or NSSI in DSM-5 (American Psychiatric Association, 2013). Respondents were also asked about suicidal intent, and those who indicated affirmatively to 'have you ever made an attempt to take your own life?' in the previous 2 weeks were categorised as an 'acute suicide attempt'. Brunner et al. (2014) reported on D-SIB prevalence rates for all participating countries (Brunner et al., 2014). The cohort from ROI consisted of 1054 youth drawn from participating schools in Kerry and Cork. Among Irish youth, with a mean age of 14.9 years, the overall lifetime prevalence of D-SIB was 20.4%, 15.21% for occasional D-SIB and 5.23% repetitive D-SIB. Prevalence rates between countries differed significantly for all rates: for lifetime D-SIB (7.12–38.55%), occasional D-SIB (12.51–25.6%) and repetitive D-SIB (2.68–12.95%). Ireland was considered to have a low rate in comparison to other countries. However, at odds with most other countries studied, rates among females in Ireland were consistently lower than males for each category. There was a lower overall lifetime prevalence of D-SIB among females (18.7%), than males (21.9%), for occasional D-SIB (females 13.76 %, males

**Table 4.** Prevalence rates of deliberate-self-injurious behaviour reported by Brunner et al., 2014, split by gender. EU averages given in ( ). D-SIB: deliberate-self-injurious behaviour

	Lifetime Prevalence D-SIB	Occasional D-SIB(SH)	Repetitive
Total	20.4% (27.6% Eu) ( $n = 215$ )	15.21% (19.73% Eu) ( $n = 160$ )	5.23% (7.83% Eu) ( $n = 55$ )
Females	18.7%	13.76%	4.93%
Males	21.9%	16.46%	5.49%

16.46%) and 5.23% repetitive D-SIB (females 4.93%, males 5.49%) (see Table 4).

For the whole SEYLE sample, access to medical treatment was low (1.96%) and occurred more often in boys than girls. This was also true with response to the ROI data. The overall rate of medical treatment for the ROI groups was 1.44%, higher among boys (2.32%) than girls (0.41%).

Kelleher and colleagues (2013a) reported on a prospective component to the Irish SEYLE cohort, giving measures at baseline ( $n = 1112$ ), 3 m ( $n = 1006$ ) and 12 m ( $n = 973$ ). They included additional questions on psychotic symptoms for respondents and reported on suicide attempts rather than D-SIB. Rates of a prior suicide attempt (SA), a response to Paykel question 5 ('Have you ever made an attempt to take your own life?') were reported as 2% at the 3-month assessment and 4% when assessed 12 months later. Rates of SA were much higher in those with baseline psychopathology (scoring in the top 20% of the Strengths and Difficulties Questionnaire, SDQ) and reported psychotic symptoms. 14% ( $n = 4$ ) of these adolescents had reported at least one suicide attempt at the 3-month follow-up, increasing to 34% ( $n = 11$ ) by 12 months. The authors estimated a 70-fold increased risk (OR 67.50, 95% CI 11.41–399.21) of suicidal attempts in the presence of both (Kelleher et al., 2013).

### *My world survey*

The grey literature identified two separate reports relevant to this systematic review. The My World Survey (MWS) examined risk and protective factors for youth mental health at two different time points. The first Report was published in 2012 collected data on the wellbeing of 14,000 youth, aged 12–25 (Dooley and Fitzgerald, 2012), but no data were collected on rates of SH or SI in the younger cohort, and so this data set was not included in this paper. A second study (MWS-2-SL) published in 2019 gathered data from school-going youth aged 12–19, mean age 14.86 (SD 1.67) and enquired about SH; hence, it is relevant to this systematic review. A total of 10,459 adolescents were recruited from 83 randomly selected post-primary schools, representing a 50% student response rate (Dooley et al, 2019 My\_World\_Survey\_2.pdf (myworldsurvey.ie)). Methodological rigour of this study included the inclusion of a nationally representative sample of schools with representations from disadvantaged and non-disadvantaged schools, gender balance and at least one school from each county in ROI.

Three questions on suicidal ideation, SH and suicide attempts were used to assess suicidality. These questions were: 'Have you ever deliberately hurt yourself without wanting to take your life?' (i) 'Have you ever thought about taking your life, even though you would not do it?' (ii) 'Have you ever made an attempt to take your life?' (iii) 'Have you ever made an attempt to take your life?' These equate to terminology of non-suicidal SH, SI and a

suicide attempt. Each question measured lifetime rate and frequency in the past year. Adolescents were also asked about whether they accessed help or support after a suicide attempt, if so, how easy it was to get, who they approached and whether they felt the support had helped.

Among the adolescents surveyed in MWS-2 ( $n = 10,459$ ), 23% ( $n = 2406$ ) reported SH with 42% ( $n = 1010$ , 9.7% total sample) having self-harmed in the last year. 23% ( $n = 553$ , or 5% total sample) had SH in the last 6 months and 19% ( $n = 457$  or 4.4% total sample) in the previous month. In general, females were found to be more likely to report SH in comparison to males (26% *v.* 18%). Rates of SH increased by school year, ranging from 15% of males and 17% of females in year 1, increasing to 18% of males and 31% of females by year 6. Individuals who reported SH were also more likely to be in the moderate, severe, or very severe categories for self-reported depression and anxiety, also measured.

With regard to suicidal ideation, 41% ( $n = 4287$ ) had SI, or thoughts about taking their own life at some point but would not do it. 45% of those (1929 or 18.4% total sample) had SI in the past year and 21% (900 or 8.6% total sample) in the previous 6 months. 7.8% of the total sample ( $n = 815$ ) reported having SI in the previous month. Similarly, to SH, females (46%) were more likely to report SI than males (34%).

The MWS also enquired whether at any point the young person had ever made 'an attempt to take (their) life?' 6% ( $n = 628$ ) of the respondents answered affirmatively, and of those, almost half (49%) were in the last year and 9% (or fewer than 1% total sample) in the last month.

MWS also enquired about help seeking, and 43% reported having received help post SH. However, this was experienced as 'difficult' or 'very difficult' in 40% cases. Most help was sought from family or friends (41%), followed by non-hospital professional groups (23%). Only 2% of the sample reported presentation at a hospital.

The study identified risk factors associated with increased risk of SH. These included self-reported harmful or hazardous drinking, possible alcohol dependence, or moderate, substantial, or severe drug use. Youth who engaged in SH were also more likely to report low support from a special adult, lower self-esteem, increased avoidant coping behaviour and lower levels of resilience than peers who did not engage in SH.

The Growing Up in Ireland (GUI) study collected salient data on youth mental health over a 9-year longitudinal period (McNamara et al., 2020 <https://www.growingup.ie/>). The data from the child cohort (8,570 of 9-year-olds) are pertinent to this analysis (<https://www.growingup.gov.ie/pubs/SUSTAT58.pdf>). When assessed (data collected between November 2015 and September 2016) at age 17/18, ( $n = 6,216$ ) respondents were asked whether they had ever self-harmed, defined as 'hurt themselves on purpose' to which 17% responded affirmatively. Two thirds (66%) reported SH by cutting, and 50% also reported SH by either 'banging, bruising or hitting', reflecting a rate of 11 and 9% in the total sample. SH was higher among females (23%) than males (12%). Higher depressive scores at age 13 were more likely to indicate having self-harmed (ever) at age 17/18 (32% compared to 14% with lower depression scores at age 13) (McNamara et al., 2020).

### Challenging times (CT) study

Two papers were identified from the Challenging Times (CT) study that report on suicidal ideation or behaviour (Lynch et al., 2004; Lynch et al., 2006). The CT study was a large ( $N = 212$ ) study

of youth aged 12–15 recruited from schools in North Dublin. A total of 742 youth completed two screening questionnaires, the Strengths and Difficulties Questionnaire (SDQ) (Goodman et al., 2000) and the Children's Depression Inventory (CDI) (Kovacs 1992). Question 9 on the CDI relates to suicidal thoughts: I do not think about killing myself, I think about killing myself, but I would not do it and I want to kill myself. Based on response to these questions, the authors report that 157 youth overall (21.7%) had suicidal thoughts, of which 17 (or 2.4% of total sample) reported suicidal thoughts with 'possible suicide intent' (Lynch et al., 2004). All of these youth ( $N = 17$ ) had scored above cut offs on the SDQ and CDI. Youth who scored above cut off on either of the two screening questionnaires or endorsed 'possible suicidal intent' (CDI-Question 9) were deemed to be 'at risk' ( $N = 140$ ) and invited for interview, of whom 101 attended. A control group ( $N = 174$ ) was also invited, with 94 consenting. Data pertaining to this group are reported in a second paper (Lynch et al., 2006). The term 'para-suicide' was used to refer to SH, with the authors using a definition similar to that used by both the CASE study and NSRF. The Suicidal Ideation Scale and Suicide Intent Scale (Beck et al., 1979) were given to report on passive or active SI. No respondent endorsed current 'significant suicidal ideation'. Only 10 participants in the 'at risk' group (1.9%) reported SI in the past, with 8 (1.5%) endorsing past SH. The authors provided a more conservative estimate of SH and SI using a weighted calculation with reference to the total sample. They report that the population prevalence rate for SI was 1.9% (as opposed to 21.7% in the screening stage), and the rate for para-suicide (or SH) was 1.5% (SH had not been asked about in the screening stage). Mills et al. (2004) reported on a significant relationship between bullying and suicidal thoughts among those 'at risk' and interviewed, although, linked to the CT study, this paper was not included in the systematic review, as no new prevalence data were provided.

### Other regional studies

Coughlan and colleagues (2014) examined SH in a methodologically robust fashion in a younger cohort of 11–13 years in two geographical areas in north Dublin city and county Kildare. This was a two-stage study, using SDQ screen ( $N = 1131$ ), followed up with a clinical interview using the Kiddie-SADS ( $N = 212$ ). SH was defined as 'non-suicidal physical self-damaging acts referring to self-mutilation or other acts done without the intent of killing self'. Among the 212 youth examined in stage 2 (mean age 11.54), 4.4% engaged in SH in the past month, but no detail is given on method type. Lifetime prevalence of SH, defined as occurring at a frequency of 2–3 times per year, was 5.1%. When defined as occurring greater than four times a year, the rate dropped to 1.7%. 4.7% reported occasional lifetime rate of suicidal ideation, with 2.1% thinking about it frequently. Past month rate of suicidal ideation occasionally was 4.7% and 0.8% for frequent (4 or more times in prior month).

Doyle and colleagues (2015) conducted a cross-sectional study of 856 school-going adolescents aged 15–17 using the same definitions as used by CASE study. Participants were recruited from 11 Dublin-based schools. They reported a lifetime history of intentional SH of 12.1% (18.1% females compared to 6.4% males). Cutting was the most frequently reported method (63.1%) with 29.1% reporting SH by overdose. Other forms of SH reported by the cohort included attempted hanging, strangulation and ingestion of battery (7.8%). Almost half (49.5%) of those who self-harmed did not look for help prior to the incident. When help

was sought, the most common source was a friend, 42%. Only a minority sought help from a family member (13%) or a professional (9% before and 12% after the SH episode).

Martyn et al. (2014) studied suicidal thoughts and acts of SH in adolescents 16–17 years of age in a rural county in the west of Ireland. Two questions on the Youth Self-Report (YSR) relate to SH and SI: 'Deliberately try to hurt or kill myself' and 'I think about killing myself in the past 6 months. Overall rates for SH were 7.2%, with 6.3% for sometimes true and 0.8% for very true/often true. Overall rates for SI were reported as 9.7%; 'sometimes true' (8.4%) and 1.3% for 'very true / often true'. The childhood depression inventory (CDI) was also used and examined past 2-week suicidal thoughts. Much higher rates were reported, 19.2%. Of these, the majority reported 'I think about killing myself but would not do it' (18.3%) compared to a much smaller percentage (0.9%) affirming 'I want to kill myself'.

Lawlor and James (2000) also studied suicidal thoughts and acts of SH using the Youth Self-Report. Their study included 779 16-year-olds in the north-eastern region of the Republic of Ireland. Rates for past 6-month SH were 11.5% for occasionally, 8.1% for frequently (with girls higher than boys, 5.9% v. 2.9%), and rates for SI were reported as 17% occasionally and 6.4% frequently (with girls higher than boys, 8.1% v. 4.6%). The authors also followed up this cohort ( $N = 110$ , 64 female and 46 male) for a year and report on rates of suicidal thoughts, but not SH (James et al., 2004). Most young people at FU did not have suicidal thoughts, 11% endorsing either occasional or frequent thoughts and lower than prior year. Although the numbers are small, the authors caution that suicidal feelings may be less transient than previously considered and that the likelihood of expressing SI at 17 was higher in previously suicidal at age 16, with odds ratios varying between 1.3 and 3.49 (depending on if occasional or frequent SI has been endorsed).

Brennan and McGilloway (2012) aimed to explore the prevalence of suicidal ideation, psychological maladjustment, and views of mental health service support in a sample of secondary school pupils. A purposive sample of 93 students, aged 15–18, in the south-east of Ireland were recruited. Past 6-month general psychopathology was gathered using the Reynolds Adolescence Adjustment Screening Inventory (RAASI Reynolds, 2001). The Suicide Ideation Questionnaire (SIQ Reynolds 1987) captured data on suicidal thoughts over the past month. These include general thoughts of death and wishes to die, to serious and more specific thoughts and ideas. Rates of SH were not collected. Out of 93 students, 30 (32%) reported past month suicidal thoughts (defined as thoughts of death or wanting to die), with 10% displaying what was defined as high levels of SI. Whilst SI occurred more often in the older age, authors reported some SI being reported to have commenced as early as age 10. SI was also found to be more common among youth who engaged in alcohol or drug use, and among those who reported having known someone who engaged in prior suicidal behaviour or ended their life by suicide ( $\chi^2 = 5.4$ ,  $df = 93$ ,  $p = 0.02$ ). 40% of respondents deemed mental health support services to be inadequate (Brennan and McGilloway (2012).

A full list of studies and rates is provided in Table 5.

## Discussion

In the Republic of Ireland, the Central Statistics office reports that deaths attributable to suicide for persons under the age of 25 have increased from 12.4% (15.7% in males and females in 6.5%) in 2015 to 19.4% (22% in males and 14.8% in females) in 2019 ([https://](https://www.cso.ie/en/)

[www.cso.ie/en/](https://www.cso.ie/en/)). Given the known associations between SI, SH and suicide, these stark figures underpin an urgent need to establish accurate data as to the true prevalence of self-harm and suicide nationally. Essential to this process is accurate definitions of what is being measured. Against this backdrop, in-depth consideration was given as to how best to define the search terms for this study to align with the study aim of maximising the capture of relevant data. In the absence of a defined gold standard, opinions and practice vary in this regard, and this is reflected in the growing literature exploring the challenges presented by use of varying and at times overlapping SH terminology (Angelotta, 2015). Careful consideration was given to the varying perspectives described in the extant literature leading to the choice of SH which is under the MESH term self-injurious behaviour and included other SH variants (i.e. harm-self, SH-intentional, SH-deliberate) and other categories of harm such as self-destructive behaviour, self-injurious behaviour and non-suicidal self-injury (NSSI). Consideration was also given to the differing views on the term non-suicidal self-injury with proponents suggesting it improves consistency in reporting (Butler & Malone, 2013) and others expressing concerns about creating a false dichotomy between "suicidal" and "non-suicidal" behaviours/attempts (Kapur et al., 2013). Cognisant of the limitations of all currently available descriptors and balancing this with the need to prioritise the alignment of the search strategy with this study's aim, the determination was to use a term that reflected a discrete or definitive behaviour, that of self-harm, but without classification by presence or degree of intent, or without regard to motive. This review therefore aligned carefully to the search term methodology used in a Cochrane Review of interventions for SH in children and adolescents (Witt et al., 2021). TSH were defined by some authors as the thought of harming oneself, irrespective of reason, whereas other studies reported on rates of thinking about 'killing oneself'. For clarity, in this systematic review, these terms are referred to as TSH and SI, respectively. These differences make comparison between studies difficult and contributes along with other factors to the wide variance seen.

Nine studies reported lifetime SH prevalence rates ranging from a low of 1.5% when rates of SH were reported based on two-stage study design (Lynch et al., 2006) to a high of 23% (MWS-2-SL; Dooley et al., 2019), where SH was limited to non-suicidal SH.

High lifetime rates (20.4%) were also found when reporting on the concept of deliberate self-injurious behaviour (D-SIB), in keeping with the concept of non-suicidal self-injury, and excluding SH by overdose (Brunner et al., 2014).

Prevalence rates for thoughts of SH or suicidal ideation also varied. Lifetime rates of SI, which required the intention to end one's life, were low (4.7% reported occasional SI and 2.1% frequent) in a study of 11–13-year-olds by Coughlan et al. (2014). This increased to 19.2% in 16–17-year-olds who reported on SI in the last 2 weeks (Martyn et al. at., 2014) whilst much higher rates (41% lifetime and 18% past year) were reported in the MWS-2 among 12–19-year-olds (Dooley et al., 2019). 6% of participants in MWS-2 were reported to have made a suicide attempt, with half in the prior year (3% total cohort).

It is reasonable to give greater weight to larger studies with well-defined criteria for SH, such as the CASE study. However, even in the same cohort, given the different samples sizes reported on in different papers, some prevalence rates differ. For example, past year TSH is reported by Madge and colleagues (2008) as 21.9% in females and 11.8% in males. Using weighted calculations, this represents an overall rate of 16.54% and not too dissimilar to the



**Table 5.** Study details included in the systematic review (N = 18)

Study author/s	Cohort / age range	Prevalence/ incidence SH	JBI quality overall appraisal score: (<5 = low; 5 – 7 = medium; >8 = high)
Griffin <i>et al.</i> , 2018	NSHRI 10-24 (data 10-19 extracted) Not population based.	10–14-year-old rate 72/100,000 (females 112; males 34) 15–19-year-old rate 449/100,000 (females 564; males 340)	8
NSHRI Report Joyce <i>et al.</i> , 2022	National SH Register Ireland <18 Not population based	Definition SH Table 1. Age 10-14 rates of SH 615/100,000 Age 15-19 rates of SH 2309/100,000	8
Madge <i>et al.</i> , 2008	CASE cohort 15-16 N = 3804	Lifetime Prevalence SH 9.22%* (13.9% Females, 4.4% males) Past Year SH total 5.66%*, 8.8% females, 2.4% males Past month total 1.81%*, 2.3% females, 1.3% males Acts resulting in hospital presentation 8.5% TSH past year 16.54%* (21.9%F, 11.8%M) Rates repetition of SH: 60.2%	7
Morey <i>et al.</i> , 2008	CASE cohort 15–17 N = 3881	Lifetime prevalence SH 9.1% Past Year SH 5.7%, Past month SH 1.8%, Past year TSH 21.6% Past month TSH 8.4% (TSH: Females 29.9%, Males 13.2%) SH (any) Hospital presentation 11.3% SH (study SH criteria applied) Hospital presentation 8.3%. Rates repetition of SH: 45.9%	7
McMahon <i>et al.</i> , 2010	CASE cohort 15–17 N = 3808	Lifetime prevalence SH 8–12% (14% Females, Males 4.4%) Past Year SH 5.7%; (8.9% Female, 2.4% Male) SH thoughts in past year 21.6% (29.8%F, 13.2%M)	7
McMahon <i>et al.</i> , 2014	CASE cohort 15–17 N = 3881	Incidence rate of hospital-treated SH as reported by the NSRF SH 344.4/100,000 (Females 438.1; Males 256.2) Rates of community SH in past year 5551/100,000 (Females 8,900; Males 2,400)	7
Kelleher <i>et al.</i> , 2013a	SEYLE cohort 11–13 N = 1112 Sub sample of youth with psychopathology (193) of whom 47 had psychotic symptoms.	Rates SA 3% at 3 m and 13% at 12 m if psychopathology alone Corresponding rates SA 14 and 34% if also psychotic symptoms The authors estimated a 70-fold increased risk (OR 67.50, 95% CI 11.41–399.21) of suicidal attempts in the presence of both.	4
Brunner <i>et al.</i> , 2014	SEYLE cohort Mean 14.9 (SD 0.89) N = 487	Lifetime prevalence D-SIB 20.4% (Females 18.7%, Males 21.9%) Occasional D-SIB 15.21% (Females 13.76%, Males 16.46%) Repetitive D-SIB 5.23% (Females 4.93%, Males 5.49%) Note: SH by OD omitted from SH study definition	4
Dooley <i>et al.</i> , 2019	My World Survey (MWS-2) 12–19 N = 10,459	Definition of SH: ‘deliberately hurt themselves without wanting to take their life.’ Lifetime prevalence SH 23% (26%F, 18%M) Past year prevalence: 9.7% Past month prevalence: 4.4% Lifetime prevalence TSH 41% Past year prevalence TSH: 18.4% Past month prevalence TSH 7.8% SA: 6% ever, 3% past year Hospital attendance: 2%	9
McNamara <i>et al.</i> , 2020	GUI 9 yr old cohort 17–18 N = 6216	Definition SH ‘had ever hurt themselves on purpose’: Lifetime prevalence SH 17% (Females 23%, Males 12%) Of those who SH: 11% SH by cutting; 9% SH by ‘banging, bruising, hitting’	9

(Continued)

**Table 5.** (Continued)

Study author/s	Cohort / age range	Prevalence/ incidence SH	JBI quality overall appraisal score: (<5 = low; 5 - 7 = medium; >8 = high)
Lynch <i>et al.</i> , 2004	Challenging Times study 12–15 N = 723 total study	CDI past 2-week SI: 21.7% total on screening (19.4% SI and 2.4% 'possible suicide intent' 'At risk' group (N = 140); 45.7% SI; 12.1% 'possible suicide intent'	8
Lynch <i>et al.</i> , 2006	Challenging Times study 12–15 Stage 2: Interviewed N = 195, 101 considered 'at risk'	Total group: (weighted calculations) SI: Current 0%; Past SI 1.9% 'Parasuicide' or SH 1.5% 'At risk' group (N = 101) Past SI 9.9% 'Para suicide' or SH 7.9%	8
Coughlan <i>et al.</i> , 2014	Regional Study Study sample 1131, subsample N = 212 11–13	Note: SH is without suicidal intent Lifetime prevalence 'occasional' SH (without suicidal intent) (2-3 times per year) 5.1% and 'frequent' SH (4+ times) 1.7% Past month prevalence 'occasional' SH 4.3%, and 'frequent' SH .4% Lifetime prevalence SA .4% Lifetime prevalence 'occasional' SI 4.7%, and 'frequent' SI 2.1% Past month prevalence 'occasional' SI 4.7%, and 'frequent' SI .8%	4
Doyle <i>et al.</i> , 2015	Regional Study (SH definition similar to CASE) 15–17 N = 856	Lifetime prevalence SH: 12.1% (Females 18.1%, Males 6.4%) Professional help sought: 9% before act, 12% after	6
Martyn <i>et al.</i> , 2014	Regional Study 16–17 N = 237	Definition of SH: YSR 'I deliberately try to hurt or kill myself.' Past 6-month rates 7.2% (6.3%, sometimes true, 0.8% very true/often true) Past 6-month rates SI: 9.7% (sometimes true 8.4%, 1.3% very true/often true) YSR Suicidal ideation 9.9% M and 9.6% CDI Past 2-week suicidal ideation: 19.2% (Thoughts of SH 18.3%, thoughts of killing oneself 0.9%) CDI Suicidal ideation 18.9% M and 19.3% F F	4
Lawlor and James 2000	Regional Study 16 years old N = 779	Definition of SH: YSR Past 6-month rates YSR SI 17% occasionally; 6.4% frequently (girls 8.1 %, boys 4.6%) Past 6-month rates YSR SH 11.5% occasionally, 8.1% frequently (girls 5.9%, boys 2.9%),	4
James <i>et al.</i> , 2004	Regional FU Study 17 years old N = 110	Only Rates SI given, using YSR 6-month. Total rate any SI: 11%	4
Brennan and McGilloway (2012)	15–18 N = 93	SIQ Past month SI: 32% (defined as thoughts of death or wanting to die) 'High levels' of SI 10%	6

\*Note: For comparison purposes, weighted calculations were made by the research team to generate total reference rates for ROI from the CASE data (Madge *et al.*, 2008) Total N = 3804, males (N = 1873) and females (N = 1931). JBI, Johanna Briggs Institute; CASE, Child and Adolescent Self-Harm in Europe Study; SH, self-harm; SI, suicidal ideation; SA, suicide attempt; TSH, thoughts of self-harm; D-SIB, deliberate self-injurious behaviour; NSHRI, National SH Register Ireland; OD, overdose; CDI, Child Depression Inventory; YSR, Youth Self-Report.

CASE average of 15.58% from which the Irish cohort is drawn. However, in the paper by Morey and colleagues (2008), using the same cohort, the rate reported for past year TSH is higher (21.6%) with higher rates for both females (29.9%) and males (13.2%).

Martyn *et al.* reported on the lowest overall rate of SH, defined as 'I deliberately try to hurt or kill myself' with 6.4%, respondents answering sometimes true and a further 0.8% answering very true or often true. However, the authors also draw attention to differences in the same cohort, based on source of reporting. They

report on rates of suicidality as established from the Children's Depression Inventory examining past 2-week suicidal ideation (19.3% F, 18.9% M) and the Youth Self Report past 6 months (19.3% F and 9.9% M) which differ significantly. The lack of concordance with rates by Brennan and McGilloway with reference to other Irish studies led the authors to state 'that it is clear that there is considerable variation in suicide ideation/self-harm rates amongst adolescents in Ireland' (Brennan and McGilloway, 2010). Whilst this is undoubtedly

true, the impact of differing methodological approaches to measuring similar but subtly differing phenomena based on distinctions in characterisations of SI/SH amplifies this variation in prevalence and significantly limits its utility in informing service design.

Notwithstanding different rates of SH or SI, most studies consistently found that rates varied by gender, with rates of SH being 2–3 times higher among females than males. However, in a study reporting on rates of D-SIB, where injury by overdose was excluded, rates were somewhat higher among males (Table 4).

Kelleher's paper highlighted the risks of suicidality associated with male gender and psychotic symptoms (Kelleher et al, 2013a). This study had 117 participants. Of the whole group in CAMHS, 12% ( $n = 14$ ) reported isolated suicidal ideation (without suicide plans or acts), 34% ( $n = 37$ ) had a history of specific suicide plans and 27% ( $n = 30$ ) had a history of suicide attempt. SI and SH were defined using the Kiddie SADS PL: suicidal ideation (thoughts of suicide but in the absence of a specific plan or method) and suicide plans (recurrent suicidal ideation with a formulated plan as to the method of suicide and suicide attempts). Psychotic symptoms were present in 52 or 46%. As expected, a significant association was found between sex and suicide plans ( $\chi^2 = 12.98$ ,  $p < 0.001$ ) and attempts ( $\chi^2 = 14.79$ ,  $p < 0.001$ ); psychotic experiences were associated with a threefold increased odds of suicide plans (OR 3.35, 95% CI 1.39–8.08) and attempts (OR 2.70, 95% CI 1.06–6.89) but were not associated with isolated suicidal ideation (OR 1.35, 95% CI 0.43–4.26). Whilst these figures are stark, further studies with larger numbers are required to replicate this finding with robust data.

It is particularly important to note that repetition is extremely common with between 45.9 and 60.2% of SH in CASE occurring more than once (Morey et al., 2008; Madge et al., 2008). Almost half (49.5%) seek help from friends or family before the incident with much fewer seeking help afterward (12%) and much lower numbers attending hospital services.

### Comparison with different countries

Some of the discrepancies between ROI studies might be explained by methodological differences including the differences in definition of terms used, cohort selection, sample size, age group, different questionnaires and timeframes examined. Given that similar factors are likely to be at play in other jurisdictions, unsurprisingly, internationally significant discrepancies exist mirroring those found in the Irish data. A study of non-suicidal self-injury conducted in the United States (Barrocas et al., 2012) found rates of 8% of youth aged between 7 and 16 years of age, while a European study of 12 countries reported a mean prevalence rate for D-SIB of 27.6% in adolescents but ranging from a low of 17.1% in Hungary to a high of 38.7% in France (Brunner et al., 2014). The rates for Ireland in this study at 20.9% were lower than the EU average. This rate concurs with that of a meta-analysis on global prevalence conducted between 2010 and 2021 by Xiao et al. (2022). They found that the aggregate prevalence of NSSI among a non-clinical sample of adolescents was similar when examining either lifetime rates (22, 95%CI 17.9–26.6) or during a 12-month period (23.2, 95% CI 20.2–26.5). Moreover, it found that repetitive NSSI was more common than episodic NSSI (20.3% *v.* 8.3%). However, in the CASE study (Madge et al., 2008), rates of lifetime SH in Ireland were similar to EU average (9.2% compared to 8.8%) and rates of TSH (16.54% compared to EU mean of 15.58%).

The Youth Risk Behavior Survey (2023) (Youth Risk Behavior Survey Data Summary and Trends Report: 2011–2021 (cdc.gov) is a biennial study of 10 000 of high school students in the USA collecting data on suicide risk with the most recent data being available for 2021. Questions asked in the YRBS include if youth have seriously considered suicide, made a suicide plan, attempted suicide, and were medically treated for a suicide attempt. Over the year 2021, 22% of high school students had 'seriously considered attempting suicide', akin to the concept of SI referenced above and higher than rates of 16.54% reported for Ireland by Madge et al. (2008), but much lower than rates of 41% in the MWS-2 (My\_World\_Survey\_2.pdf (myworldsurvey.ie). 18% of US students had made a suicide plan, 10% had 'attempted suicide' at least once and 3% had required treatment for their injury by a doctor or nurse. All rates were higher among females and minority groups (cdc.gov). The discrepancies between studies may be reflective of increasing rates over time. In fact, all rates in YRBS, except medical attendance post SH, have significantly increased over the last decade (cdc.gov). SI rates in YRBS in 2009, a similar timeframe to Madge et al. (2008), were 13.8% and somewhat lower than the rate in Ireland.

In Ireland, a further methodological issue which limits national generalisability is the regional focus of many of the studies. It is not clear whether difference in studies reflects the geographical areas from which cohorts are gathered. The National Self-Harm Registry of Ireland (NSHRI) gathers data on all individuals who present to emergency departments across Ireland with SH (Griffin et al., 2017). Even in the NSHRI, the generalisability of available data may also be limited by particular local contexts, such as access to out of hours emergency department services, extent of community counselling and presence of school MH supports. Even examining rates of SH presentations to the three paediatric settings in Dublin show significant variation across hospitals (McNicholas et al., 2023). It is reasonable to assert the potential that SH data in regions without access to specialised paediatric hospitals may be less comprehensive, with consequent under-estimation of SH rates. It is well established that many young people who have self-harmed do not subsequently present to a hospital or healthcare professional (only 8.5–11.3% in the CASE cohort and 2% in the MWS), representing a significant limitation to the potential for hospital data to capture community SH prevalence. Despite data collection in the NSHRI being limited to emergency departments, it provides an important framework to assist development of more comprehensive detection and reporting of SH data in youth as in adults.

SH and suicidal ideation are important predictors of suicide (Ross et al., 2023), and thus accurately identifying and appropriately addressing these are vital suicide prevention strategies. As outlined previously, this study primarily focused on acts of SH rather than suicidal ideation, given the ability to apply rigorous definitions. However, the impulsive nature of most SH, with almost half occurring within 30 minutes of the thought, underscores its unpredictability and highlights the inherent challenge to effectively reducing SH rates. The dynamic nature of the risk of SH and its association with suicide further heightens the very real clinical challenges involved. Furthermore, it emphasises the need to embed simple, long-established strategies such as safety at home and reducing access to lethal means at a societal and individual level. These measures have consistently been shown to be impactful and cost-effective.

Whilst acts of SH precipitate help seeking more frequently than thoughts alone, youth who express suicidal ideation, and view their

lives as not worth living, may be at even higher risk of death by suicide, yet many remain unrecognised. Suicidal ideation, feelings of futility, and anhedonia may all occur in the context of depressive disorders making it imperative that these youths are assessed to rule out psychiatric illness and when present, appropriate treatment is instigated. The importance of clinical assessment following positive endorsement of SI by screening questionnaire was highlighted by O'Sullivan and Fitzgerald (1998). 44% of a sample of 101 13–14-year-olds screened positive for SI by questionnaire, but this reduced to 29% following home interview. Similar reductions were seen for rates of SH (44% by screen compared to 29% at interview). Similarly, in the CT study, rates of SI identified via screening reduced from 21.7 – 1.9% following semi-structured interview (Lynch *et al.*, 2006). Understanding the factors which mitigate/protect for and against risk of progression from thought to action is needed, allowing the opportunity to assist youth develop more adaptive coping strategies. Furthermore, research is required to collect more comprehensive and accurate data on rates of SH with or without SI to help plan services. Ensuring the inclusion of different regions to allow robust, generalisable findings is essential. Population studies are needed as well as studies in clinical samples to include those youth who may not present to a clinical setting such as the emergency department. These should seek to recruit sample sizes with clear definitions of SH.

We are increasingly becoming aware of the deleterious effect of early adverse childhood experiences (ACE) on later psychopathology including SI and SH. The work by Lyons-Ruth *K* and colleagues (2013) highlighted the link between adversities in infancy and childhood and later self-harm behaviours. More recent data from the Northern Ireland Youth Wellbeing Survey (NIYWS) (Bunting *et al.*, 2023) found that each additional ACE increased the likelihood of self-harm (88 %) and suicidal ideation (88%), along with mood and anxiety disorders (81%). Positive childhood experiences (PCE), less often reported, were found to have the opposite effect, and independently to ACEs reduced self-harm to 13% and suicidal ideation to 7%. This offers an additional avenue for preventive work, by early identification of ACE and promotion PCE.

The Covid-19 pandemic has heralded an increase in SH presentations to emergency units among children and adolescents in Ireland and internationally (Wong *et al.*, 2023). In a large multinational study, involving 62 emergency departments (ED) in 25 countries, rates of ED presentation were twice as high between March 2020 and April 2021, with SH contributing to a higher proportion of all psychiatric presentations. The increased rate was also more prevalent among girls (Wong *et al.*, 2023). Interestingly, in this study, increased presentation of SH among boys occurred during periods of increased stringency (Wong *et al.*, 2022). Furthermore, peak age of presentation following Covid-19 was aged 16 compared to 19 in 2019, suggesting that Covid-19 may have had an untoward effect on youth (Joyce *et al.*, 2020). Madigan and colleagues conducted a systematic review examining ED SH presentations among youth and identified 42 studies from 18 countries published between 2020 and 2022 (Madigan *et al.*, 2023). They conclude there is good evidence of an increase in ED SH presentations among girls (1.39, 1.04–1.88) but only modest evidence for boys (1.06, 0.92–1.24) They also report this increase was more likely among older youth and in fact decreased slightly in the younger cohort. Some studies have identified additional risk factors of suicidality during Covid-19, including youth with prior MH issue, including substance use, gender minority youth and youth living in single-parent homes (Turner *et al.*, 2021). This

highlights the close relationship between SH, not a disorder in and of itself, and mental illness and also identifying modifiable risk factors which if addressed might contribute to lower levels of SH and improved quality of life. Research focusing on post-Covid-19 trends are essential to establish whether altered trajectories continue or 'course correct' with increasing distance from the seismic, global risk factor represented by Covid-19. It's longer-term downstream effect with respect to SH/SI broadly and ED presentations will only be clear with time.

An important aspect that requires further research is the extent of overlap or differentiation between those youth who engage in an act of SH and those youth who have diagnosable mental health conditions that require specific treatments. SH co-occurs with both maladaptive behaviours and emotional dysregulation. In a study conducted by Sorgi *et al.* (2021), when examining university undergraduates, emotion dysregulation and other maladaptive behaviours including binge eating, purging and illicit drug use and physical aggression were each related to lifetime NSSI history. Moreover, much evidence has demonstrated the contagion effect of SH. McMahon *et al.* (2013) examined 3,881 Irish adolescents utilising the CASE cohort and found that one third of the sample had been exposed to suicidal behaviour in another, and that exposed adolescents were eight times more likely to report own SH. The adolescents who were exposed also shared common risk factors with those reporting SH. The researchers found that individuals who were exposed also presented with maladaptive profiles on psychological, life event and lifestyle domains. In this regard, it is important to consider these presentations when developing self-injury assessments and for full coverage treatment. Future research should seek to establish the prevalence of SH comorbid with mental disorders, versus the possibility of transient acts of SH among dysregulated or distressed youth who may not necessarily have a diagnosable mental health condition, and how the treatment needs differ between such groups. This would help to establish whether some youth may benefit from brief psychosocial interventions that can potentially be scaled to provide more rapid access to large numbers of youth presenting, without necessarily needing to attend more resource-intensive psychiatric or multi-disciplinary specialist mental health services that may be limited in availability (Glenn *et al.*, 2019). International research has studied the effectiveness of SH programmes provided in a non-clinical context such as a school-based setting (Liljedahl *et al.*, 2023). Thus, further epidemiological research is key not only to understand how often youth SH occurs, but also to inform critical decisions about how the available resources can be more effectively deployed to meet the needs of the greatest possible number of children and adolescents.

## Conclusion

Despite the profound importance of seeking to prevent youth suicide, the available research data on suicide risk factors such as SH and SI in Ireland is limited. In addition, comparison or synthesis of the data identified in this systematic review is limited by significant study heterogeneity; however, the data signal suggests that when stricter, severity criteria are utilised overall prevalence decreases. Heterogeneity includes age and selection of samples, terminology used, reference period and year of data collection. Future research needs to consider the importance of clearly defined and shared terminology such that trends in SH and SI can be considered and specific risk and protective factors for

youth living in Ireland understood. Robust studies using clear definitions of terms, separately capturing SH with and without suicidal intent, are required to inform service developments. Given the low level of help seeking, among youth who engage in SH and the impulsive nature of acts, it is imperative to ensure psycho-education is delivered to families and peers, and furthermore that primary and specialist MH services are accessible. Identifying youth where SH or SI occurs in the context of a mental illness is a priority to ensure that appropriate evidence-based treatments can be offered.

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