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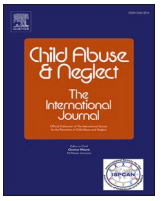

Non-suicidal self-harm among adolescents with substantiated childhood maltreatment: Findings from the Norwegian Triple-S Study

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A B S T R A C T

Background: Childhood maltreatment (CM) is a well-established risk factor for psychological distress and self-harm in adolescence. However, few studies have examined how specific types of maltreatment, multivictimization, and familial factors jointly contribute to non-suicidal self-harm (NSSH).

Aims: To investigate the prevalence and correlates of NSSH among Norwegian adolescents with substantiated experiences of CM, including associations with specific subtypes, multivictimization, ethnicity, and family history of self-harm.

Method: We analysed self-reported data from 308 adolescents (aged 12–18 years; 81.2 % girls) with substantiated maltreatment experiences who attended a national residential facility for children and young people with experience of abuse and violence between 2016 and 2024. Self-harm behaviours were assessed using validated items adapted from the CASE study. Associations were examined using Poisson regression, adjusting for age and sex.

Results: Overall, 52.8 % reported a history of self-harm, with 35.8 % reporting ≥10 episodes. Girls were more likely to report NSSH than boys (59.3 % vs. 25.0 %), although boys reported an earlier age of onset. One in six participants reported familial self-harm or suicide attempts. Self-harm prevalence increased with the number of maltreatment types experienced, from 42.4 % (one type) to 61.0 % (four or more types). All CM types were associated with high rates of NSSH. Ethnic Norwegian adolescents had higher self-harm prevalence than their immigrant-background peers.

Conclusions: NSSH is alarmingly common among adolescents exposed to CM, particularly among girls and those who have experienced multivictimization. These findings highlight the need for early, developmentally appropriate, and family-inclusive intervention strategies.

1. Introduction

Childhood maltreatment (CM), including physical, emotional, and sexual abuse, as well as neglect and witnessing violence, is a major global public health issue associated with increased risk of a wide range of psychological difficulties, including self-harm and suicidality (Gilbert et al., 2009; Stoltenborgh et al., 2015).

Self-harm in adolescence, particularly non-suicidal self-harm (NSSH), is a major public health concern (Moran et al., 2024) which

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has been consistently associated with experiences of maltreatment (Calvo et al., 2024; Liu et al., 2018). However, many existing studies either aggregate different types of CM or focus on a single subtype (e.g., sexual abuse), which limits our understanding of how specific CM types contribute to NSSH risk. Some findings suggest that less overt types of maltreatment, such as emotional abuse and neglect, may be just as strongly associated with NSSH as more overt forms of violence (Calvo et al., 2024), underscoring the need to examine multiple CM subtypes in parallel.

The cumulative burden of multivictimization, exposure to multiple types of CM, also appears particularly harmful, increasing the risk of both suicidal and non-suicidal self-injury (Finkelhor et al., 2007a; Turner et al., 2010). Gender differences in self-harm are well-established, with adolescent girls consistently reporting higher rates than boys, particularly following maltreatment (Bresin & Schoenleber, 2015; Serafini et al., 2017). Another potentially important but underexplored factor is ethnicity. Some studies suggest that self-harm prevalence and associated risk factors may differ across ethnic groups, influenced by sociocultural norms, experiences of discrimination, and differences in help-seeking behaviour (Al-Sharifi et al., 2015). However, these findings are inconsistent, often limited by reliance on self-reported maltreatment without verification, underscoring the importance of studies utilizing substantiated maltreatment experiences.

In addition to individual experiences of CM, familial history of self-harm and suicide attempts may further shape adolescent risk. Such history could act as a social modelling mechanism or reflect shared genetic vulnerabilities for emotion dysregulation and impulsivity (Jarvi et al., 2013). The Integrated Motivational-Volitional (IMV) model of suicidal behaviour (O'Connor, 2011; O'Connor & Kirtley, 2018) offers a useful framework to conceptualize these dynamics, proposing that early life adversity, when combined with perceived entrapment, lack of support, and access to self-harm models, may lead to self-injurious thoughts and actions. Indeed, adolescents with a family member or a close friend who has self-harmed are more likely to engage in self-harm than those without such exposure (O'Connor et al., 2012).

While international evidence underscores the links between CM and self-harm, studies that simultaneously examine specific CM subtypes, multivictimization, and familial risk remain scarce. Clarifying how these intersecting risk factors relate to NSSH is crucial for designing effective and targeted prevention strategies.

The current study aims to address these gaps by examining the relationship between different types of childhood maltreatment and non-suicidal self-harm in a population-based sample of adolescents with verified maltreatment experiences. Specifically, we aim to: 1) Assess the prevalence and characteristics of NSSH among adolescents exposed to CM; 2) Examine how individual CM types (i.e., sexual, physical, emotional abuse, neglect, witnessing violence) relate to NSSH risk; 3) Investigate the cumulative effects of multivictimization; and 4) Explore whether NSSH risk varies by ethnicity and familial history of self-harm or suicide attempts.

2. Methods

2.1. Study design and setting

The Norwegian Triple-S Cohort Study is an ongoing longitudinal study that focuses on children and adolescents with verified experiences of maltreatment (Schonning et al., 2021). The study collects detailed data on maltreatment history, mental and somatic health, and functioning across various life domains. For the current cross-sectional analysis, we used self-reported data from adolescents aged 12–18 years who had experienced maltreatment and attended the Stine Sofie Centre (SSC) between January 2016, when the centre opened, and December 2024.

2.2. Participants

Participants were recruited from the SSC, a national non-profit facility that offers a week-long stay for children and adolescents (ages 5–18 years) with substantiated histories of abuse or violence. Referrals to the SSC are made by professionals such as healthcare providers, child welfare services, and crisis centres. The SSC covers all costs related to travel, lodging, and meals, which the Norwegian Directorate for Children, Youth and Family Affairs fully funds. Adolescents were eligible for inclusion in the current study if they met the following criteria: (1) were between 12 and 18 years of age; (2) had attended the SSC; and (3) had sufficient Norwegian language proficiency to complete study materials independently. Data collection began in January 2021 and is ongoing. Between January 2021 and December 2024, 207 adolescents provided self-reported data during their stay at the SSC, corresponding to a response rate of 55.9 % (out of 370 eligible adolescents). In addition, a retrospective recruitment phase targeted adolescents who had attended the SSC between January 2016 and December 2020. During that period, 327 adolescents had attended the stay at the SSC, and 99 provided self-reported data. However, because the number of distributed invitations was not recorded, an accurate response rate could not be calculated for this group.

In total, self-reported data from 308 adolescents aged 12–18 years were available and included in the present analysis. Participants were recruited using a convenience sampling approach based on their availability and willingness to participate at the time of the SSC visit or through retrospective invitation.

2.3. Ethics

All participants received detailed information about the study and provided informed consent electronically. In Norway, adolescents aged 12 years and older can independently consent to participate in research concerning abuse, domestic violence, or other health-related topics where there may be a conflict of interest between the child and their caregivers (*Norwegian Health Research Act.*

Lovdata, 2017). Data is collected through a secure web-based system developed and maintained by the Norwegian Institute of Public Health. All participants were offered psychological support if participation caused distress. SSC staff were trained in trauma-informed care. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2013. All procedures involving human subjects/patients were approved by the Regional Committee for Ethics in Medical and Health Research for the South-Eastern region of Norway (approval #95445).

2.4. Instruments

2.4.1. Self-harm behaviour

Self-harm was assessed using a question adapted from the Child and Adolescent Self-harm in Europe (CASE) Study (Madge et al., 2008): "Have you ever deliberately taken an overdose (e.g., of pills or other medication) or tried to harm yourself in some other way (such as cutting yourself)?" This item has demonstrated good construct validity and test–retest reliability in cross-national adolescent samples (Madge et al., 2008). Follow-up questions examined the timing and frequency of these behaviours, categorized as: '1–2 times,' '3–9 times,' and '≥10 times.' Additional questions addressed when the participant last engaged in self-harm, their age at the most recent incident, and their age at first occurrence. Participants were also invited to describe the methods used in self-harm episodes through free-text responses, with encouragement to provide specific details (e.g., the names of medications involved in overdose incidents). Classification of self-harm behaviours followed the CASE guidelines and definition, which describe self-harm as an *"act with a non-fatal outcome in which an individual deliberately did one or more of the following: initiated behaviour (e.g., self-cutting, jumping from a height) intended to cause self-harm; ingested a substance in excess of the prescribed or generally recognized therapeutic dose; ingested a recreational or illicit drug in an act regarded by the person as self-harm; or ingested a non-ingestible substance or object."*

Familial history of self-harm was assessed by asking participants whether any family members had ever attempted suicide or deliberately harmed themselves. Response options included: 'No', 'Yes, attempted to take their own life', 'Yes, attempted to harm themselves' (not mutually exclusive). Participants who selected either of the latter two options were further asked when the event occurred, with response options being: 'More than one year ago', and 'Within the last year'.

2.4.2. Childhood maltreatment exposure

Exposure to five types of CM was assessed (sexual abuse, neglect, physical abuse, emotional abuse, and witnessing violence) using instruments previously translated to Norwegian for use in the UEVO study (an acronym for the Norwegian name: Ungdomsundersøkelsen om Erfaringer med Vold og Overgrep [*Childhood Experiences of Violence and Abuse*]) (Hafstad et al., 2020). These categories reflect core domains of maltreatment consistent with international frameworks (Hillis et al., 2016). Several items were derived from the Juvenile Victimization Questionnaire (JVQ) (Zou, 2004), while additional items on neglect and emotional abuse were drawn from a national Swedish adaptation of the JVQ (Jernbro & Janson, 2017). These measures have been used in population-based adolescent studies and are well validated in Nordic contexts.

Sexual abuse by an adult was assessed using six items based on international studies (Mohler-Kuo et al., 2014), adapted for Norwegian use in previous prevalence studies (Hafstad et al., 2020; Mossige & Stefansen, 2016; Myhre et al., 2015). Adolescents rated the frequency of non-consensual sexual acts on a 4-point scale ranging from "never" (1) to "often" (4). The items covered being 1) kissed, 2) shown private body parts, 3) made to show one's private body parts, 4) made to touch another's private body parts, 5) having one's private body parts touched, or 6) subjected to other sexual acts (including intercourse and the use of fingers/mouth). The adolescent was categorized as having experienced sexual abuse if they indicated at least once on any item.

Neglect was assessed using six items adapted from a validated instrument employed in the Adverse Childhood Experiences (ACE) study (Felitti et al., 1998), and translated for Norwegian use in the UEVO study (Hafstad et al., 2020). Responses were rated on a 5-point scale ranging from "never" (1) to "always" (5). The items included 1) being provided with enough food, 2) having to wear dirty clothing, 3) their parents being too intoxicated by alcohol or other drugs to care for them, 4) being taken to the doctor, if necessary, 5) whether someone in the family made them feel important or special, and 6) whether someone cared about them. The adolescent was categorized having been neglected if they indicated *never* or *rarely* on items 1, 4, 5, and 6, or *often* or *always* on items 2 and 3.

Physical abuse was assessed using six yes/no items previously translated into Norwegian and Swedish for use in Scandinavian prevalence studies (Hafstad et al., 2020; Jernbro & Janson, 2017; Myhre et al., 2015). The items covered whether the adolescent had experienced: (1) being pinched or having their hair pulled; (2) being violently pushed or shaken; (3) being slapped with an open hand; (4) being hit with a fist or a hard object; (5) being kicked; or (6) being beaten up. Physical abuse was categorized as present if the adolescent indicated *yes* to any item.

Emotional abuse was assessed using seven items from the Parent-Child Conflict Tactics Scale (Straus et al., 1998), previously translated into Norwegian for use in the UEVO study (Hafstad et al., 2020). Adolescents responded on a 4-point scale ranging from "never" (1) to "often" (4). The items covered being 1) ridiculed in a hurtful way, 2) called stupid or useless, 3) threatened with abandonment or being kicked out, 4) threatened with physical punishment, 5) locked out of the home, 6) locked in a confined space, and 7) threatened with harm to the family's pet. Emotional abuse was categorized as present if the adolescent indicated *sometimes* or *often* on any item.

Witnessing intimate partner violence (IPV) was assessed using six items derived from the ACE Study (Felitti et al., 1998), previously translated into Norwegian for use in the UEVO study (Hafstad et al., 2020). Adolescents rated the frequency of exposure on a 4-point scale ranging from "never" (1) to "often" (4). The items covered seeing a parent being 1) yelled at, 2) ridiculed, 3) violently pushed or shaken, 4) slapped or hit, 5) beaten up, or 6) subjected to other forms of violence. The adolescent was categorized as being a witness to

violence if they indicated at *sometimes* or *often* on any item.

A multivictimization variable was computed by summing the number of CM types reported by each adolescent, categorized as exposure to one type, two to three types, or four or more types. This approach aligns with the concept of polyvictimization, which reflects the co-occurrence of multiple forms of victimization and is supported by evidence of a cumulative burden and dose–response relationship between the number of CM types and adverse outcomes (Finkelhor et al., 2007b; Ford & Delker, 2018). Although polyvictimization is often defined as exposure to three or more types (Finkelhor et al., 2007b), recent reviews have highlighted the lack of a consistent definition in the literature (Radtke et al., 2024). We use the term multivictimization to align with prior Nordic research, while acknowledging its conceptual overlap with polyvictimization.

2.4.3. Sociodemographic information

Participants' age and sex at birth were obtained using their Norwegian personal identity numbers. Adolescents were grouped into two age categories: 12–15 years and 16–18 years. This division was based on the use of separate questionnaire versions, each tailored to provide age-appropriate content and validated specifically for these developmental stages across thematic areas. In addition, the age grouping reflected Norwegian regulations on research consent: adolescents aged 12–15 can provide independent consent to participate in sensitive research (e.g., on maltreatment), but require additional ethical safeguards and simplified communication. At age 16, adolescents are considered legal adults for research purposes and can provide independent consent without such restrictions. Thus, the grouping was guided by practical, legal, and ethical considerations rather than theoretical or developmental frameworks. Ethnicity was categorized according to the birthplace of participants and their parents, distinguishing, for example, between Norwegian and immigrant backgrounds.

2.5. Statistics

Descriptive statistics were used to calculate the prevalence rates and counts of self-harm behaviours for boys, girls, and the total sample, with 95 % confidence intervals to assess estimate precision. Poisson regression models were applied using the Generalized Linear Model (GENLIN) procedure with a log link function and robust standard errors to examine associations between self-harm and exposure variables. This approach is recommended when estimating relative risk for common binary outcomes, as it avoids the overestimation that can occur with odds ratios and aligns with the recommendations by Zou (2004). These models were used to estimate adjusted marginal means (prevalence) and adjusted risk ratios (RRs), along with 95 % confidence intervals, based on exponentiated regression coefficients. All tests were two-sided, and a significance level of $\alpha = 0.05$ was applied. Model fit diagnostics were not computed because standard fit indices (e.g., deviance, Pearson chi-square) are not valid when using Poisson regression with robust standard errors in SPSS GENLIN. All analyses were conducted using IBM SPSS Statistics, Version 30 (IBM Corp, 2023).

3. Results

3.1. Prevalence of self-harm

A significantly higher proportion of girls (59.3 %) reported having ever engaged in self-harm compared to boys (25.0 %) ($p < .001$). Overall, 52.8 % of participants reported self-harm at some point. Among participants who had engaged in self-harm, 75.3 % reported that their most recent episode occurred within the past 12 months, while 24.7 % reported it occurred >12 months ago. There were no significant gender differences in the timing of the most recent self-harm episode (see Table 1 for details).

Among participants who provided additional detail about their self-harm ($n = 227$; 73.7 % of the total sample), cutting was the most commonly reported method ($n = 128$; 41.6 %), followed by intentional overdose or substance ingestion ($n = 43$; 14.0 %). Other methods, including self-hitting, scratching, biting, burning, and similar behaviours, were reported by 56 participants (18.2 %). A small number of responses ($n = 7$; 2.3 %) were non-classifiable due to unclear intent or insufficient detail.

Regarding the frequency of self-harm behaviours, 20.3 % of participants who self-harmed reported engaging in self-harm 1–2 times, 43.9 % reported self-harming 3–9 times, and 35.8 % reported self-harming 10 or more times. These differences were not statistically significant between genders. The mean age of onset for self-harm was significantly lower among boys (10.6 years) compared

Table 1
Prevalence and characteristics of self-harm behaviours among boys and girls exposed to childhood maltreatment.

Self-harm characteristics	Girls ($n = 250$)		Boys ($n = 58$)		*P*-value	Total ($n = 308$)	
	Prevalence (n)	(95 % CI)	Prevalence (n)	(95 % CI)		Prevalence (n)	(95 % CI)
Self-harm (ever)	59.3 % (144)	(53.1 % - 65.5 %)	25.0 % (14)	(13.7 % - 36.3 %)	$p < .001$	52.8 % (158)	(47.1 % - 58.5 %)
When was the last time?					$p = .978$		
≤12 months	75.4 % (107)	(68.3 % - 82.5 %)	75.0 % (9)	(50.5 % - 99.5 %)		75.3 % (116)	(68.5 % - 82.1 %)
>12 months	24.6 % (35)	(17.5 % - 31.7 %)	25.0 % (3)	(0.5 % - 49.5 %)		24.7 % (38)	(17.9 % - 31.5 %)
How many times?					$p = .384$		
1–2 times	19.0 % (26)	(12.4 % - 25.6 %)	36.4 % (4)	(8.0 % - 64.8 %)		20.3 % (30)	(13.8 % - 26.8 %)
3–9 times	44.5 % (61)	(36.2 % - 52.8 %)	36.4 % (4)	(8.0 % - 64.8 %)		43.9 % (65)	(35.9 % - 51.9 %)
≥10 times	36.5 % (50)	(28.4 % - 44.6 %)	27.3 % (3)	(1.0 % - 53.6 %)		35.8 % (53)	(28.1 % - 43.5 %)
Age of onset, mean (95 % CI)	12.2	(11.6–12.8)	10.6	(6.4–14.8)	$p < .001$	12.1	(11.6–12.7)

to girls (12.2 years) ($p < .001$).

Overall, 15.8 % of participants reported suicide attempts within the family, and 18.2 % reported self-harm behaviours in family members (Fig. 1). These differences were not statistically significant between genders. In the total sample, 17.5 % reported that familial self-harm or suicide attempts occurred within the past 12 months, and 9.1 % reported these incidents occurred >12 months ago. There were no significant gender differences in the timing of these familial events.

3.2. *Prevalence and risk factors of self-harm among maltreated adolescents*

As displayed in Fig. 2, self-harm prevalence varied some across age groups, ethnicity, types of CM, and levels of multivictimization after adjusting for age and sex. While no significant differences were found between adolescents aged 12–15 years and 16–18 years in self-harm prevalence, ethnic Norwegian participants reported a higher prevalence of self-harm (55.4 %) compared to immigrant participants (40.0 %), with a significant increase in risk (adjusted RR = 1.11, 95 % CI: 1.01–1.22).

Although exposure to different types of CM was not statistically associated with self-harm prevalence, a subtle trend was observed. It is important to note that these categories were not mutually exclusive, and participants could be exposed to multiple types of CM simultaneously. However, the low number of participants in each combination of CM exposures limited the ability to statistically test these overlaps. Slightly higher rates of self-harm were noted among participants exposed to sexual abuse (61.4 %), neglect (59.3 %), physical abuse (59.5 %), and emotional abuse (56.1 %), whereas those who witnessed violence showed a somewhat lower, yet still considerable, prevalence (51.3 %).

Multivictimization was significantly associated with increased self-harm prevalence. Participants exposed to one type of maltreatment reported a self-harm prevalence of 42.4 %, which rose to 56.7 % among those exposed to two or three types (adjusted RR = 1.11, 95 % CI: 1.02–1.20), and further to 61.0 % among those exposed to four or more types (adjusted RR = 1.14, 95 % CI: 1.04–1.25).

4. Discussion

This cross-sectional study, based on data from the ongoing Norwegian Triple-S Cohort Study, examined the prevalence and correlates of NSSH among adolescents with substantiated experiences of CM. Our findings reveal a high prevalence of self-harm in this high-risk population, with 52.8 % of participants reporting a history of self-harm and nearly one in three who self-harm reporting repeated episodes (≥10 times). These results underscore the substantial psychological burden associated with maltreatment during adolescence and highlight the urgent need for targeted and sustained mental health interventions.

The observed prevalence of NSSH in this study was substantially higher than in the general adolescent population. For instance, a population-based study of Norwegian adolescents by Hysing et al. (2015) found that 14.3 % had engaged in self-harm, while a nationally representative sample of young adults reported a lifetime prevalence of 16.2 % (McManus et al., 2019). In contrast, over half of the adolescents in our maltreated sample reported NSSH. This marked disparity highlights the disproportionate burden faced by

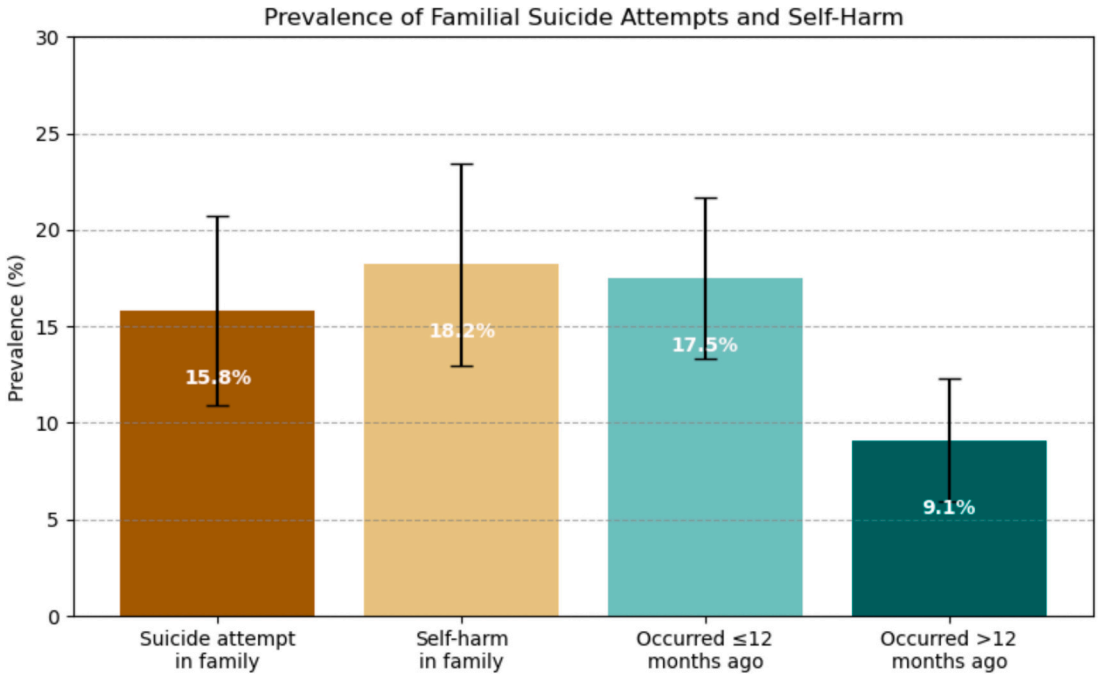

Fig. 1. Prevalence of familial suicide attempts and self-harm among adolescents with a history of childhood maltreatment.

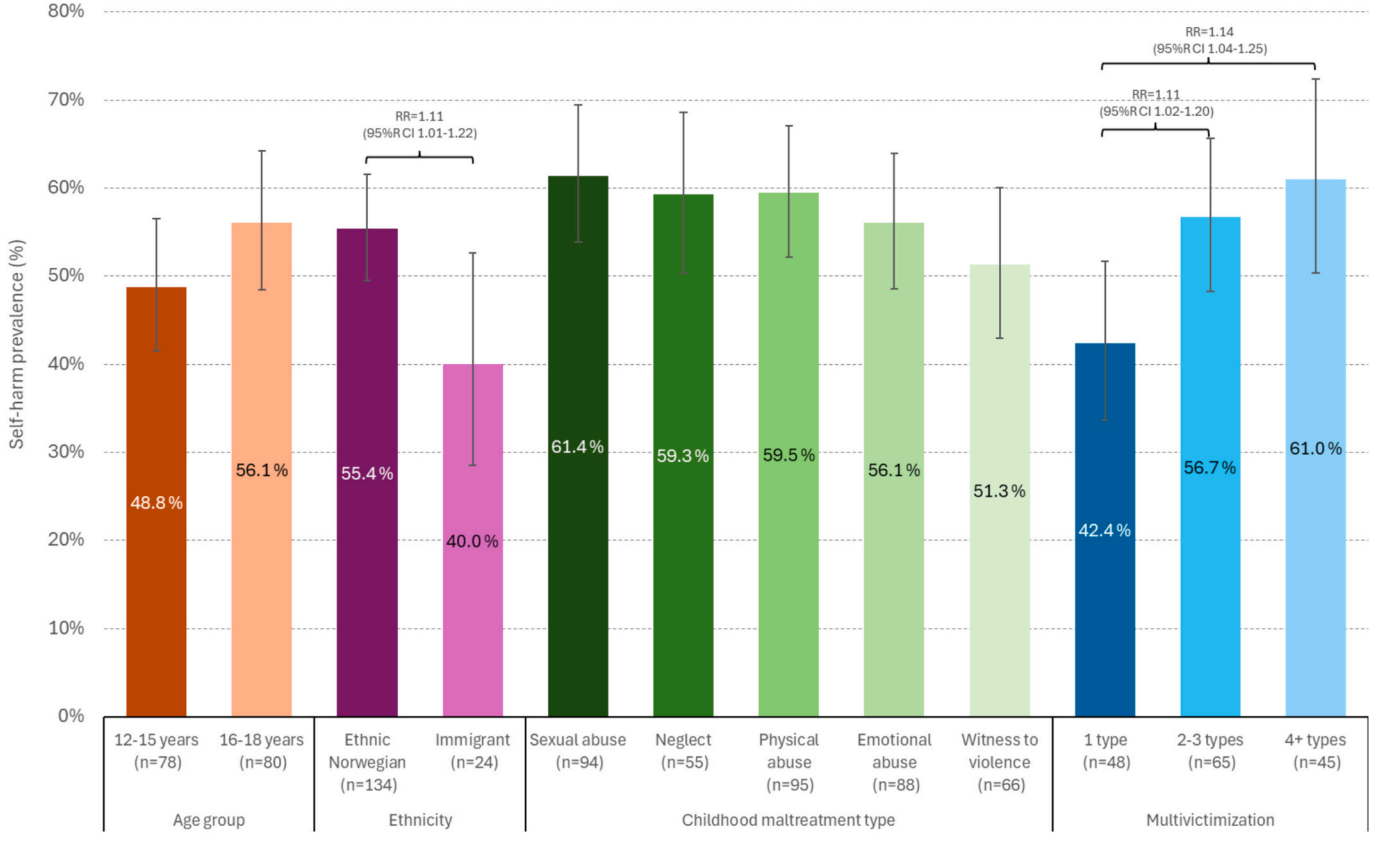

Fig. 2. Age- and sex-adjusted prevalence of self-harm among adolescents exposed to various types of childhood maltreatment, stratified by age, ethnicity, and multivictimization. RR = risk ratio; CI = confidence interval. Due to overlapping exposure among individuals across maltreatment categories, we did not calculate RRs comparing the different maltreatment types directly.

maltreated youth and underscores the compounded risk associated with early adversity. It also reinforces the need for targeted interventions addressing overlapping vulnerabilities, such as poor sleep and emotional dysregulation.

In line with previous studies (Bresin & Schoenleber, 2015; Serafini et al., 2017), adolescent girls in our sample were significantly more likely than boys to report self-harm. However, the mean age of onset was lower among boys, suggesting that while fewer boys engage in NSSH, those who do may begin at an earlier age. This unexpected finding could indicate that boys, particularly those with a history of maltreatment, represent an especially vulnerable group, underscoring the need for targeted early detection and prevention efforts among younger males who may otherwise be overlooked by traditional screening methods. Nevertheless, the confidence interval for the age-of-onset estimate among boys was relatively wide compared to girls, adding some uncertainty to this observation. Additionally, other national studies have typically reported an earlier onset of NSSH among girls (O'Connor, Wetherall, et al., 2018), a discrepancy likely reflecting the high-risk nature of our sample compared to non-selected community populations used in previous research. While individual CM subtypes were not significantly associated with NSSH after adjustment, a clear dose–response relationship emerged between the number of CM types experienced and self-harm risk. Adolescents exposed to four or more types of maltreatment had a significantly higher likelihood of NSSH than those with single-type exposure. This aligns with previous studies on multivictimization (Finkelhor et al., 2007a; Turner et al., 2010) supporting the notion that cumulative exposure to adversity heightens vulnerability to emotional dysregulation and psychopathology, and is consistent with earlier findings indicating a dose-response relationship between child maltreatment and NSSH (Hu et al., 2025; Turner & Colburn, 2022). Importantly, emotional abuse and neglect were also associated with high rates of NSSH, findings that reflect growing recognition that these less visible types of maltreatment may be just as psychologically damaging as physical or sexual abuse (Calvo et al., 2024). However, our ability to detect statistical differences across CM subtypes may have been limited by sample size and the non-mutually exclusive nature of the categories.

Ethnic Norwegian participants reported higher rates of self-harm than their immigrant-background peers. While this contrasts with some international findings suggesting elevated self-harm risk among ethnic minority groups (Al-Sharifi et al., 2015), also in a Nordic context (Turner & Colburn, 2022), it may reflect underreporting due to stigma, cultural norms, or reduced trust in research among minority youth (Celik & Cakar, 2025). Alternatively, ethnic Norwegian adolescents might experience fewer protective buffers, such as strong community support. This finding underscores the need for culturally sensitive research and intervention approaches. Approximately one in six adolescents reported a family history of suicide attempts or self-harm, consistent with the Integrated Motivational-Volitional (IMV) model (O'Connor, 2011; O'Connor & Kirtley, 2018) and previous research (O'Connor et al., 2012), which posits that early-life adversity combined with exposure to self-harm models or genetic vulnerabilities increases suicidal ideation and behaviours. While this study did not directly test intergenerational transmission, the prevalence of familial self-harm suggests the importance of family-centred assessment and prevention.

Emerging evidence highlights altered stress physiology, specifically dysregulated hypothalamic-pituitary-adrenal (HPA) axis activity, as a key factor linking early adverse experiences to increased self-harm vulnerability. O'Connor, Green, et al. (2018) demonstrate that individuals with suicidal behaviours exhibit blunted cortisol responses to stress, suggesting impaired coping and heightened emotional distress, thereby increasing self-injury susceptibility. Considering our study's focus on maltreated adolescents, similar mechanisms, such as impaired stress regulation, likely contribute significantly to observed self-harm prevalence. This interpretation aligns with the IMV model, emphasizing psychological and physiological pathways, and reinforces the importance of enhancing stress regulation capacities in maltreated youth to mitigate self-harm risks.

These findings reinforce the critical importance of identifying and supporting adolescents who have experienced multiple maltreatment types. Screening for self-harm and suicidal risk should be routine in services for maltreated youth, particularly girls and those with multivictimization histories. Family history of self-harm should be considered in risk assessments, and interventions integrating family-based support may be beneficial. The high NSSH rates, alongside its early onset and recurrence, underscore the need for programs addressing emotion regulation, coping strategies, and interpersonal functioning. Mental health services and school-based supports must adequately identify and respond to self-harm among vulnerable adolescents.

This study's strengths include a well-characterized cohort with confirmed maltreatment exposure and substantiated self-harm measures. However, several limitations should be noted. The cross-sectional design precludes causality or temporal conclusions, and self-reported data may introduce recall bias or underreporting. The overall sample size and limited numbers in key subgroups may have reduced statistical power, particularly for detecting weaker associations or interactions. As a result, some meaningful effects may not have reached statistical significance. Additionally, findings based on a Norwegian sample referred to a specialized centre, and with confirmed maltreatment, may limit generalizability to adolescents who have not been in contact with similar services. Specifically, Norway's child welfare system, including referral practices and accessibility of specialized services, as well as societal stigma related to self-harm, may differ substantially from other contexts, potentially influencing maltreatment prevalence estimates and self-harm reporting. Moreover, the age groupings used (12–15 and 16–18 years) were based on legal and procedural requirements tied to national research consent regulations rather than developmental or international standards such as the WHO classification. This may limit comparability with studies using more widely adopted age-based definitions of adolescence. Finally, the instruments used to assess maltreatment did not collect information on perpetrator identity, duration of abuse, or the age at which the abuse occurred. This lack of contextual detail represents an additional limitation when interpreting maltreatment profiles and their associations with self-harm.

5. Conclusion

In conclusion, self-harm is alarmingly prevalent among Norwegian adolescents with histories of childhood maltreatment.

Multivictimization, emotional abuse, neglect, and family self-harm history significantly contribute to this elevated risk. Developmentally appropriate, family-inclusive approaches to assessment, prevention, and intervention are needed. Public health responses should prioritize early identification and sustained support to mitigate long-term mental health consequences of early-life adversity.

CRediT authorship contribution statement

Børge Sivertsen: Writing – original draft, Methodology, Funding acquisition, Data curation, Project administration, Investigation, Formal analysis, Conceptualization. **Rory C. O'Connor:** Methodology, Writing – review & editing. **Daryl B. O'Connor:** Writing – review & editing, Methodology. **Kaia Kjørstad:** Writing – review & editing, Methodology, Project administration, Data curation. **Anders Dovran:** Data curation, Conceptualization, Writing – review & editing, Funding acquisition. **Gertrud Sofie Hafstad:** Funding acquisition, Writing – review & editing, Conceptualization. **Mari Hysing:** Investigation, Writing – review & editing, Formal analysis, Funding acquisition, Conceptualization.

Transparency declaration

The manuscript is an honest, accurate, and transparent account of the study. No important aspects of the study have been omitted, and all discrepancies from the original study plan have been explained.

Analytic code availability

The analytic code supporting the findings is available to other researchers and can be accessed by contacting the first author (BS).

Research material availability

N/A

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Declaration of competing interest

None.

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Data availability

Norwegian data protection regulations and GDPR impose restrictions on sharing individual participant data. However, researchers may request access to survey participant data by contacting the primary investigator (borge.sivertsen@fhi.no). Approval from the Norwegian Regional Committee for Medical and Health Research Ethics (https://helseforskning.etikkom.no) is required for access to the data. The dataset is administered by the NIPH, and guidelines for data access can be found at https://www.fhi.no/en/more/access-to-data.

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